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CHAPTER 9

Summary of Findings

IN the hope that the major findings can be so presented that an attentive reader can follow them without referring to the detailed discussion, it seems useful to provide a summary—if only to bring the threads of the analysis together in a conveniently brief account. In the process of summarizing, however, it is difficult to avoid oversimplifying and, in omitting evidence and qualification, claiming too much. The critical reader should, therefore, turn to the substantive chapters.

The Central Topic (Chapters 1 and 2)

By capital formation we mean diversion of part of the current product for use as capital, that is, goods to produce other goods or income. Specifically, it is defined here to include current construction, flow of producers' durable equipment to users, net additions to inventories of business units and other agencies (but not households), and—in order to allow for this country's position among others—net changes in claims against foreign countries. Gross capital formation is the sum of these four components before deduction of current consumption of fixed capital—construction and producers' durables. Net capital formation is the sum of these four components after deduction of current consumption of fixed capital. In the concepts used here, the sum of gross capital formation and flow of goods to ultimate consumers (households or associations of these) is gross national product. The sum of net capital formation and flow of goods to ultimate consumers is net national product or national income—the two terms being used interchangeably here.

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Two aspects of this definition of capital formation must be noted even in a brief summary. First, we exclude additions to or drafts upon the stock of capital that result from forces extraneous to economic processes proper. Manna from heaven and fire from hell, fortuitous legacies of nature and the destruction of war, may affect the stock of capital at the disposal of a nation. These effects are not included in capital formation, inasmuch as our interest is in economic processes and in the way they operate to augment or reduce productive wealth at our disposal. This interest is justified, in that additions to capital from current product have been by far the major component of the change in capital stock. If we lived in a world in which productive wealth was greatly and frequently affected by other means, our interest in capital formation as part of current economic product would be far less intense.

The second exclusion from our totals is much more important. The greatest factor in economic capacity to produce is the stock of knowledge—not measured by the commodities (or foreign claims) that enter our capital formation totals. Indeed, there is a question whether such stock can be measured directly in a meaningful fashion. However, among the items that we include in flow of goods to ultimate consumers, some distinctly measure inputs that add to our stock of knowledge, as for example, outlays on education and research; and others contribute to an increase in the productive capacity of human beings by making them healthier and happier, as for example, outlays on medical care and recreation. These items, if identifiable, could be assigned economic magnitudes. But there are two reasons for excluding such uses of current product from capital formation. First, it is hard to draw the line between uses of such goods for the purpose of adding to productive capacity and their uses for a richer life. Second, these investments by ultimate consumers, unlike the components of capital formation defined here, are not part and parcel of the complicated mechanism of capital investment and financing. Yet for many purposes—particularly the study of economic growth over long periods and among widely different societies—the concept of capital and capital formation should be broadened to include investment in the health, education, and training of the population itself, that is, investment in human beings. From this point of view the concept of capital formation followed here is too narrow.

Why, then, do we study capital formation made up of additions to the stock of tangible capital goods? Simply because this stock is in-

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dispensable to adequately high levels of economic productivity. Granted that, without the accumulated body of knowledge and a healthy and educated labor force, such stock of capital is useless. Yet, if knowledge does exist and human labor is available to apply it, effective use of those resources requires material capital goods. Major additions to our technology—the mechanization of spinning or weaving, the introduction of coal and coke for smelting iron and making steel, the invention of the stationary steam engine and its use for transportation, the discovery of electric power and its production in giant hydroelectric plants, and the brilliant promises of power and automation from applications of atomic energy—each has called for large inputs of resources into construction and equipment. One persistent bottleneck in the use of knowledge in economic production has been the scarcity of the resources for the production of capital goods needed for the application of new knowledge. Furthermore, since efficient production requires some minimum of capital goods per worker, the growth of population and the labor force requires accumulation of more capital. This is so even if no capital-demanding innovations are introduced, provided that capital-saving inventions do not swing the balance in favor of the same or higher efficiency with a lower supply of capital per worker.

Capital formation is, therefore, our primary interest because it is essential to economic productivity and economic growth. And since capital formation is diversion from current product, on a countrywide scale it represents the real savings of the nation. In a society such as ours, the basic decisions that determine capital formation are those made by households, business units, and governments, in the disposition of their income between current expenditures and savings. It is these savings that finance capital formation, i.e., permit the would-be users of capital to secure funds for the purchase of capital goods. The relations between national capital formation and the savings of various groups within the nation, which fall under the title of financing, are complex. The question that provides the guiding thread in our study is what determines the volume, composition, and industrial destination of capital formation, and financing is treated as a mechanism, the analysis of which is needed to illuminate approaches to that question.

Capital formation and its financing are strategic not only for long-run economic change—as one group of conditions for economic growth—but also for the short-term fluctuations that affect the course of a country's economic activity—its business cycles. As long known, capi-

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tal formation fluctuates during business cycles with a far wider amplitude than does flow of consumer goods; and a similarly high sensitivity to business cycles is characteristic of the savings of individuals, business firms, and even governments. For these reasons, the role of capital formation and financing in business cycles, in connection with the problem of economic stability, has long been a subject of economic analysis—of direct bearing upon economic policy. But here our interest lies in the long-term aspects, the trends in capital formation that are of more direct bearing upon economic growth than upon stability, although the two are interrelated.

Long-term trends are sustained movements in one direction, movements that dwarf any fluctuations around or deviations from them. While their measurement requires statistical tools for distinguishing them from the short-term fluctuations, neither the long-term trends nor the short-term cycles are mere statistical artifacts. Life may impress us with its day-to-day ups and downs, and we may often feel that a persistent long-term trend is an illusion. But individuals, business firms, and governments do plan for the longer-range future—a range transcending a month, a year, or even a decade; and, with due allowance for partial failure, the plans are carried through. There is continuity in society, within generations and between generations. And the quantitative data for many aspects of economic production, with no statistical manipulation whatever, display impressive and sustained rises, on which the short-term fluctuations appear as mere ripples. Long-term trends might have been illusory in both the Old World and the New when, for lack of knowledge of natural processes and means of controlling them, the rate of population increase was very low with correspondingly low economic growth potentials. Populations were preoccupied with survival and subsistence, with many a setback (disease, natural calamities, massacres, famines) in the struggle. The last one and a half to two centuries have witnessed, in many now developed countries, long-term trends that far surpassed those of the past in both magnitude and the sustained character of the rise.

In measuring long-term trends in capital formation and financing in this country, we find, however, in addition to short-term fluctuations of some four to nine years' duration—associated with business cycles—long swings in the rate of growth, spanning roughly twenty years. These long swings are particularly prominent in nonfarm residential and related construction, and in durable capital investment by railroads; and they are sufficiently marked in many other components of

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capital formation and financing to merit attention. Both the statistical treatment and the analytical discussion are, therefore, complicated by the distinction between the long-term trends and the long swings—the former being sustained movements that transcend even the latter in duration.

Trends in Total Capital Formation (Chapter 3)

The measures of capital formation used here extend back to 1869, thus covering a period of over eight and a half decades. It may be asked whether it is realistic to view this long period as framing a continuous process, in which the economy almost ninety years ago is regarded as comparable with the economy today. The treatment is a working assumption, hardly susceptible of definitive proof. All that can be said here is: the period covers not much more than three generations; numerous economic actions initiated even in the 1870's—on railroads and other investments, on expansion to the West, on corporate organization and regulation, to mention but a few—are still influencing us today. Even if many material trappings of the 1950's are the results of inventions and innovations that were unknown in the 1870's, they may at least have been dreamed of then. The basic lines that guide our society are not so novel that our forebears of the post-Civil War days would not find much that is familiar to them and would not be able to understand the problems of economic growth, stability, and security that concern us today. To declare that we live in a new era implies that our past has lost all meaning for us, that it has ceased to influence the patterns of our present life and our individual and institutional responses to the problems of the day. We find it impossible to deny the effects of the past on the present, and hence, on the future.

In measuring long-term trends in capital formation since 1869 we use averages covering twenty to thirty years in order to free the measures from effects of the long, twenty-year swings noted above. The only exception is the single post-World War II decade, used to give us some idea of the recent levels compared with the past, although there is a persistent question whether the averages for 1946–1955 truly represent the long-term trend levels unaffected by the phasing of the long swing.

The growth in the volume of capital formation can first be summarized in terms of dollar values in constant (1929) prices. In this

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summary we deal with capital formation, excluding the military items (military construction and munitions), which are studied separately in the detailed discussion, and the inclusion of which modifies the broad long-term trends only slightly. We use Variant III national product, for which our estimates are most detailed, although the results yielded by Variants I and II are not very different from those of III.

1. The annual volume of gross capital formation rose from about \$3.5 billion in 1869–1888 to \$19 billion in 1929–1955, and \$30 billion in 1946–1955. This long-term rise over some three-quarters of a century was thus to about nine times the original level.

2. Capital consumption (depreciation) charges, estimated here largely on the basis of constant economic life spans and straight-line depreciation, also rose rapidly, from an annual level of about \$1.5 billion in 1869–1888 to over \$14 billion in 1929–1955 and slightly over \$19 billion in 1946–1955. The rise here was, therefore, to about thirteen times the initial level.

3. Net capital formation also grew appreciably, from \$2.0 billion per year in 1869–1888 to \$4.7 billion in 1929–1955 (when the average was greatly reduced by the depression of the 1930's and the war emergency of 1942–1945), and to about \$10.5 billion in 1946–1955. The rise was to over five times the initial level.

4. Large and rising volumes of capital formation mean cumulatively enormous additions to the stock of reproducible capital at the disposal of the economy. Even the "nettest" measure of this stock—that adjusted for all cumulated depreciation—grew from \$27 billion in 1869 to \$419 billion in 1955, or between fifteen and sixteen times its original level. The rise is still striking when the net stock of reproducible wealth is related to the labor force or total population: per member of the labor force, it rose from \$2,100 in 1869 to \$6,400 in 1955, more than tripling; per capita, it rose from \$700 in 1869 to \$2,500 in 1955, almost quadrupling.

This record of long-term growth in capital formation and in the stock of reproducible wealth is just as familiar as it is impressive. It is common knowledge that, over the decades since 1869, population and economic product of this country grew at high rates. Population increased from 40 million in 1869 to 166 million in 1955, while the labor force grew from 13 million to 66 million. With more people and workers, there was inducement to accumulate more capital not only to supply the workers with tools, households with residences, and other units with needed buildings, but to provide all with roads,

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bridges, inventories, and so on. With more labor at hand, there was at least one means of doing it. Net national product in 1929 prices grew from \$267 per capita in 1869–1888 to \$974 in 1946–1955. That growth was both cause and effect of the growth in capital formation. It was cause in that increased product made possible a larger diversion to capital stock, and it was effect in that the growing volume of capital formation and the growing stock of capital permitted higher total output per worker and per capita.

In this impressive but familiar story, the only point to be noted is the striking rise in capital consumption. Since it grew at an appreciably higher rate than that of gross capital formation, its ratio to the latter also rose—from 0.4 in 1869–1888 to 0.65 in 1946–1955. In other words, in the earlier period it took \$1.7 of gross capital formation to provide \$1 of net capital formation, i.e., net addition to capital stock; in the recent decade it took almost \$3 of gross capital formation to do so. What caused that trend, and what is the significance of the growing share of consumption (replacement) in gross capital formation?

The causes are many and technical, but can be summarized briefly and, we hope, intelligibly. First, given a constant economic life span of a durable good (and a simple depreciation schedule), current depreciation or consumption is a mirror of past gross additions. If such additions grow at a decreasing percentage rate, the ratio of current consumption or depreciation to current gross capital formation will rise. Second, if the average economic life span of durable capital declines over time, either because the rate of obsolescence or economic deterioration of a specific good rises, or (as actually happens) the share of the shorter-lived producers' equipment rises relative to the longer-lived construction component, this, too, will cause the ratio of capital consumption to gross capital formation to rise. The third factor, which is in a way a variant of the second, has to do with the share of depreciable durable capital relative to the nondepreciable net components—net changes in inventories and in claims against foreign countries. If the share of depreciable durable capital in total gross capital formation rises, the result again will be a rise in the ratio of capital consumption to total gross capital formation. In fact, all three of the immediate determinants just noted have operated over the time span covered here. The percentage rate of growth of gross capital formation has declined, in association with the slowing down in the rate of growth of population and of national product. The share of producers' durable equipment in gross durable capital formation has

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risen, and quite appreciably; and the weight of durable capital formation, subject to depreciation, in gross capital formation has also risen.

While the immediate determinants of the rise in the ratio of capital consumption to gross capital formation can be clearly seen, the significance of the rise is not easy to assay. The estimate of capital consumption is after allowance for maintenance and repair. It does not represent physical deterioration, or a decline in the physical capacity of the capital good to produce. It is largely a measure of obsolescence, reflecting the appearance of new and more efficient capital goods with the passage of time. Consequently, replacement of capital consumed means raising the productive capacity over and above the old to the extent measured by the rate of obsolescence—and this is particularly true of producers' capital equipment. An increasing ratio of capital consumption to gross capital formation does not mean that more new capital must be used for replacement, to make good the ravages of physical deterioration. It is rather a measure of the proportion of new capital that is needed to bring the existing stock to the latest level of efficiency. Net capital formation, then, is what remains for addition to capital stock, after the existing stock has been replaced to compensate for the lag in efficiency behind the ever-rising level set by advancing technology.

Any explanation of the levels of, and trends in, capital formation must relate it to national product. When this relation is considered, a query arises why the volumes and rates of growth in capital accumulated, large as they have been, have not been larger.

5. Gross capital formation accounted for about one-fifth of gross national product, both in current and in constant prices. When the comparison is in constant prices, the trend in the ratio is downward—from 22.6 per cent in 1869–1888 to 21.5 per cent in 1909–1928 and to 17.6 per cent in 1946–1955. When the comparison is in current prices, there is a very mild rise or general long-term stability, the percentages being 20.2 in 1869–1888, 20.9 in 1909–1928, and 21.3 in 1946–1955.

6. With gross capital formation a stable or declining proportion of gross national product, and the ratio of capital consumption to gross capital formation rising appreciably, the ratio of net capital formation to national income (or net national product) shows a distinct downward trend. For volumes in constant prices, the share declines from 14.6 per cent in 1869–1888 to 11.2 in 1909–1928 and to 7.0 per cent in 1946–1955; for volumes in current prices the movement is from 13.0 per

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cent in 1869–1888 to 11.0 per cent in 1909–1928 and to 8.7 per cent in 1946–1955.

7. A related measure is the ratio of net capital stock to net national product. This average capital-output ratio rises from 3.2 in 1869–1888 to 3.6 in 1909–1928, but drops to 2.5 in 1946–1955. Even in 1929–1955, when the ratio is raised by underutilization of capital during the depression of the 1930's and the war years, 1942–1945 (military items are excluded here and above), it is 3.3—somewhat lower than in 1909–1928. In other words, in recent decades a larger product could be turned out with less capital investment. And this earlier rise and recent decline in the capital-output ratio is also evident when we relate the grosser capital stock total, net of retirements only, to the appropriate national product total.

In the light of these findings, the query raised above can be amplified by asking why, if real product per capita grew 20 per cent per decade, the long-term net national saving rate was below 15 per cent; why it declined instead of rising; and why the share of gross capital formation in gross national product barely exceeded 20 per cent and at best showed only a very slight rise, even for current prices volumes.

These questions can be answered in two ways. One emphasizes the demand for capital funds and implies that under the existing economic and social conditions larger *ex ante* savings would not have found an outlet because capital investment opportunities were limited. If—to illustrate—technological and other factors determine how much capital is needed per unit of final product at a given time, that is, if they fix the level of the net capital-output ratio at, say, not more than 3 or 4 to 1, a rise in final product (national income) at the rate of 4 per cent per year would mean a ratio of net capital formation to national income of not more than 0.12 or 0.16 (0.04×3 , or 0.04×4). Yet there are major flaws in this approach to the questions. The purely technological constraints are clear only if we deal with a single product, and with the minimum capital stock needed to produce it. Even then, the actual ratio can vary within wide limits above the indispensable minimum, since the range of choice is wide—in the intensity of utilization of capital and in the recourse to more or less capital-intensive processes. When we deal with a variety of products, as included in national income, the divergence between the minimum capital-output ratio and the one that may actually be realized is all the wider, because if capital funds are readily available the economy may emphasize the more capital-intensive industries or processes. In particular, when

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we consider the large stock of new knowledge awaiting productive exploitation and the wide investment opportunities abroad that presumably existed throughout most of the period under discussion, it is difficult to assume that the level of capital formation and the factors behind the stability of the gross capital formation proportion and the decline of the net capital formation proportion are the results of long-run limitations upon the supply of capital investment opportunities.

The alternative approach, which emphasizes the supply of savings, seems more plausible and more fruitful as an analytical lead. Given the limited relative contributions to nationwide savings that, under our institutional conditions, could be made by corporations (in the form of undistributed profits) and by governments, the main question suggested by this approach is why the ultimate consumers in our rapidly growing economy managed to save only a small proportion of their income (at best slightly over 10 per cent), and a proportion which, on a net basis, declined rather than rose, despite rising real income per capita.

The various arguments advanced to answer this question indicate that, among the income groups below the very top, savings reasonably justified by the needs they are to serve (retirement, reserves, etc.) can be but a moderate fraction of income; that the share of the very top income groups in total income has been limited both by the very dynamism of our economy and by public policy (on income and inheritance taxation) which have restricted cumulative concentration of wealth in the same hands, and that these limits on the share in income of the top income groups also held down their share in total savings. Central to all the causes of the low savings-income proportion are the basic features of our economic and social life which, with the free association and mobility among economic groups, made for a strong drive for emulative consumption, and the continuous technological changes in both consumer and producer goods, which stimulated a high and rapidly rising consumption demand. At the same time, many expanding consumer expenditures represented education, training, and preparation for higher earnings in the future, and were in fact, for the individuals concerned, substitutes for money savings of the type used to finance capital formation as defined here. Also, forced saving through credit creation by financial institutions and government is subject to limits of its own, in its possible effect on voluntary saving.

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Finally, in recent years, particularly since World War II, monetary savings of individuals and corporations have often been heavily offset by government dissavings, that is, by expenditures on current uses (and on military durables, excluded from capital formation in this summary) financed by borrowing rather than by current revenues.

The analysis of trends in total capital formation is thus linked with the discussion of the factors determining the volume of savings, which leads us to the forces that determine the volume of savings of income groups below the top, the forces that set the share of the very top income groups, and those that limit savings of corporations and governments. The analysis thus indicates the need to examine the whole economic and social structure of income recipients and of a wide range of economic institutions; it can therefore do little more than indicate the directions of further exploration. The conclusion of our discussion—that the limitation on savings available for financing capital formation held down capital formation levels and may have accounted for the decline in the *net* capital formation proportion—cannot, therefore, be more than a reasonable impression. The empirical data are not sufficient to permit us to tell whether the factors adduced spell a net capital formation proportion of 10, 15, or 20 per cent, and unmistakably indicate a declining rather than a constant or slightly rising trend. And, in general, *ex post facto* data can never provide definite proof. They cannot enable us to discriminate properly between two alternative hypotheses each of which refers to *ex ante* assumptions: (1) that would-be savings were greater than would-be capital investment opportunities (and that, therefore, the latter served as a brake); or (2) that would-be savings were smaller than would-be capital investment opportunities (and that, therefore, the former served as a brake). Furthermore, the arguments summarized above deal with long-term factors, on both the demand-for-capital and the supply-of-savings sides. In the short run, the level of capital formation can be below the available supply of savings, because the supply may be offered in different forms and on different conditions from those of the demand for capital funds. In the long run, the meshing of supply and demand for funds is attained, and that is the chief purpose of the complex structure of financial intermediaries. But in the short run, supply and demand may not mesh, and the short run is ever with us. In this sense, capital formation may be limited not merely by the supply of savings or the demand for capital investment but also by the factors that produce a short-term mismatching of the two and by the off-

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setting forces that facilitate and accelerate their adjustment at the highest possible level of capital investment.

Trends in the Structure of Capital Formation (Chapter 4)

In studying a large aggregate like this country's capital formation, much can be learned by examining its components, if they are affected by different factors and hence behave differently. Our classifications are governed largely by the availability of data, but the data, in turn, reflect commonly observed differences in form, type, and channel of capital formation. The trends in the components, like those in the totals, have to be studied with the aid of averages for twenty to thirty years.

With several classifications to be considered, the summary follows the order of the discussion in Chapter 4 and deals separately with the trends in (1) net changes in claims against foreign countries; (2) structure of domestic capital formation by type of capital good—construction, producers' durables, and net changes in inventories; (3) structure of domestic capital formation by category of user—households, business firms, and governments; (4) shares of selected industry sectors—agriculture, mining, manufacturing, and the regulated industries—in net business durable capital formation.

NET CHANGES IN CLAIMS AGAINST FOREIGN COUNTRIES

1. Gross sources of foreign claims against this country (imports of commodities and services, income on foreign investments, and net unilateral transfers) have ranged over long periods (since 1874) between 5 and 8 per cent of gross national product, excluding war years but including military items throughout, since these may give rise to claims. The trend was slightly downward, from 8 per cent in 1874–1895 to 6.8 per cent in 1946–1955. However, the long-term decline is much sharper if we allow for the supporting effects of unilateral transfers on exports. If we exclude these gifts and grants to other countries, which add to their claims against us, the ratio of foreign inflows to gross national product drops from close to 8 per cent in 1874–1895, to less than 6 per cent in 1923–1928, and to 5 per cent in 1946–1955.

2. Gross sources of claims by the United States against foreign countries (exports, and income on investment abroad) ranged from 5.6 to 7.5 per cent of gross national product, excluding war periods but including military items in gross national product, and the ratio showed

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no apparent long-term trend. However, the constancy may have been due in part to the bolstering effect of exports by the proportional increase in unilateral transfers.

3. The net balance of inflows and outflows (net foreign capital investment) changed from negative in 1874–1914, that is, from net imports of capital, to positive, or to net investment abroad, despite large unilateral transfers. Except for war periods, the net foreign balance proportions to gross national product, including military, were quite small—less than 1 per cent.

4. These net balances were also moderate fractions of gross capital formation (excluding military items), rising from about –2 per cent in 1869–1898 to a peak of +8 per cent in 1899–1928, and dropping to +2 per cent in 1946–1955. They were larger fractions of net capital formation, ranging from net foreign investment here of about 3 per cent in 1868–1898 to flow of capital abroad of about 20 per cent in 1919–1948 (a proportion raised by the small volume of net domestic capital formation in the depressed 1930's and through the war years), and dropping to less than 6 per cent in 1946–1955.

These findings suggest three questions discussed in detail in Chapter 4.

The first concerns the small contribution that foreign capital made to capital formation in this country from the 1870's to World War I—surprising in view of the rapid growth of this country during that period and the large investment opportunities that it presumably provided. A brief summary of the discussion in Chapter 4 must suffice here.

The limited proportional contribution of foreign capital to the national product and capital formation in the United States is explained by the following facts: the economic magnitude of all would-be creditor countries was limited relative to that of all would-be debtor countries, even if we assume that all the savings of the former could be channeled into foreign investment; only a portion of the domestic savings of foreign net creditor countries was available for flow abroad, the rest being required at home for uses connected with the needs of members of the community who remained at home and would not be induced to migrate by the greater prospects of growth in the would-be borrower countries; of all savings available for foreign investment, a substantial fraction was channeled with political considerations or advantages in mind, of little importance in respect to the United States—neither a colony nor an active participant in the diplomatic combinations of the Old World. One might add that, in general, a

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large and rapidly developing country is unlikely to secure a large proportion of its capital formation from abroad. The conditions favoring its rapid growth also favor rapid accumulation of domestic savings, and whatever it secured from the limited pool of capital funds available for economically motivated foreign investment could not be a dominant fraction of its own large domestic savings.

The second question—why the United States shifted to a net creditor position even while its domestic growth and internal need for savings were presumably still high—can also be answered by summarizing the more detailed discussion. It was essentially a matter of a more rapid rise in capital exports than in the inflow of capital from abroad. The rise in capital exports was due partly to the greater stimulus for direct investment abroad—a reflection of the growing reliance on imports of raw materials and on exports of manufactured products. Another factor was the greater availability of savings accessible for portfolio investment abroad—a result largely of the growth of the network of financial institutions that externalized savings and made them more fluid. The rise resulted also from the necessarily greater involvement of the old creditor countries in world wars, which necessitated repatriation of their funds from this country during the war periods, and created conditions (extending into the postwar years) in which lending by this country was stimulated largely on government account and as a matter of national interest.

The third question, concerning the factors limiting capital outflow from the United States, once it became a net creditor, to small proportions of its national product and capital formation, can be answered partly by specific reference to conditions existing since World War I—a combination of pressing needs for capital formation at home and of disturbed conditions in many would-be borrower countries. A more general answer would suggest that, aside from the transient pressures that occur during wars, so long as growth of population and advances in technology assure domestic demand for savings originating in this country, even peaceful conditions do not necessarily mean that large proportions of savings would be available for foreign capital investment by the United States. The very size of the country, and those characteristics of its structure noted above in explaining the limited savings propensities and capital formation proportions also suggest the reasons for the limited proportions (although not the absolute amounts) of savings normally available for investment abroad to total savings or to national product.

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STRUCTURE OF DOMESTIC CAPITAL FORMATION, BY TYPE OF CAPITAL GOOD

1. The share of gross construction in domestic gross capital formation declined: for volumes in current prices, it dropped from over 60 per cent in the successive thirty-year periods ending in 1918 to 54 per cent in 1929–1955 (and to 53 per cent in 1946–1955); for volumes in constant prices, it declined from close to 70 per cent to less than 50 per cent in 1929–1955 (and 1946–1955). The share of net changes in inventories also declined: for totals in current prices, from about 15 per cent in 1869–1898 to about 5 per cent in 1929–1955 (and 1946–1955); for totals in constant prices, from about 10 per cent in 1869–1898 to about 6 per cent in 1929–1955 (and 8 per cent in 1946–1955). The share of producers' durable equipment rose, and quite markedly: for volumes in current prices, from somewhat over 20 per cent in 1869–1898 to over 40 per cent in 1929–1955 (and 1946–1955); for volumes in constant prices, from about 20 per cent to almost 45 per cent in 1929–1955 (and almost 46 per cent in 1946–1955).

2. The long-term trends in the structure of domestic net capital formation are a bit different. The share of net construction declined, particularly for volumes in constant prices. The share of net producers' durables rose—even more conspicuously than in the gross totals—from somewhat over 10 per cent in 1869–1898 (for volumes in constant prices) to 37 per cent in 1929–1955 (and to 29 per cent in 1946–1955). But the trends in the share of net changes in inventories differ from the trends in their share in domestic gross capital formation: for net volumes in current prices, the share still declined, although moderately, from over 25 per cent in 1869–1898 to 17 per cent in 1929–1955 (and to 16 per cent in 1946–1955); for volumes in constant prices, it tended to rise. In either case, however, even the thirty-year averages show up-and-down movements in the share of net changes in inventories in the domestic net capital formation total.

3. Within total construction we can distinguish nonfarm residential, government, and "other." This last category (a residual) includes farm construction, business and plant construction, and construction by non-profit institutions, but the business sector dominates it. On the basis of values in constant prices, we find that the share of governments in total construction rose rapidly and markedly, to the point where the share of government construction in total domestic capital formation also rose. The share of nonfarm residential construction in gross construction declined somewhat, from 40 per cent in 1869–1898 to about 30 per cent in 1929–1955 (and 34 per cent in 1946–1955), but its share

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in the net total rose from over 50 per cent in 1869–1898 to 64 per cent in 1929–1955 (and 58 per cent in 1946–1955). In either case, the share of nonfarm residential construction in domestic capital formation would show a downward trend—but not a marked one. It is the share of other construction in both gross and net total construction that markedly declined: in gross, from well above 50 per cent in 1869–1898 to below 40 per cent in 1929–1955 (and 1946–1955); in net, from above 40 per cent in 1869–1898 to a negative amount in 1929–1955 (and to 15 per cent in 1946–1955). Obviously, the sharp drop in the rate of growth of other construction accounts largely for the decline in the share of construction in total domestic capital formation.

Some of these findings bear closely upon the allocation of capital formation among major user groups and can best be discussed in the next section. Here we limit our comments to the trends in the share of net changes in inventories in domestic capital formation, and in the share of other—essentially business—construction, relative to those in the share of producers' durable equipment.

Our long-term estimates of net changes in inventories are less reliable than those of the other capital formation components, and our knowledge of the factors that determine allocation of capital formation between them and the other components is equally limited. The one argument advanced in the discussion begins with the obvious statement that net changes in inventories and net durable capital formation, particularly business, serve the same end, that is, facilitate additions to final product. If we assume that the ratios of net changes in inventories and net durable capital formation to additions to final product remain constant (or are subject to similar trends), the share of net changes in inventories in *net* domestic capital formation will remain constant. We know that the share of capital consumption in gross domestic capital formation rose, and that the share of net in gross domestic capital formation declined. It follows that a constant or even slightly rising share of net changes in inventories in *net* domestic capital formation means a declining share in *gross* domestic capital formation. In this explanation of the findings just noted, the unresolved point is whether the ratios of net changes in inventories and of net durable capital formation to additions to final product were constant or moved similarly. There is ground for assuming that the same factors determine both ratios to some extent: expansion of durable capital also means expansion of inventories. Our estimates permit us to calculate the ratios and see how they moved, but in view of

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the crudity of the inventory estimates, great reliance cannot be placed on this evidence.

The rise in the share of producers' durable equipment and the decline in the share of other construction in domestic capital formation, whether gross or net, mean that *within* durable business capital formation, gross or net, the shift away from construction and toward durable equipment (machinery, tools, etc.) has been marked. No complete explanation of this shift is provided by the data at our disposal, but some forces behind it can be suggested. The trend is apparently the result of a combination of intraindustry and interindustry shifts. Within certain major industrial sectors—agriculture, mining, manufacturing, the regulated industries (particularly the last)—the early phases of expansive growth and capital formation were characterized by substantial shares of construction. The new farm structures, industrial plants, and transportation systems were built, and the initial heavy investment in track, buildings, and so on, was made. In the later phases of their growth these industries could turn out an increasing volume of product with minor additions in construction, and there was a shift to more equipment. Among the industrial sectors, those with a higher ratio of construction to equipment, particularly the utilities, were of far greater weight in total business capital formation between the 1870's and 1914 than in more recent decades, and that interindustry shift contributed to the declining share of construction relative to that of machinery and equipment. Along the same lines, certain recent technological changes may also have contributed to the same result: the modern type industries producing highly fabricated, lighter products tend to have a lower ratio of construction to equipment than the older type industries producing primary metal shapes and other simpler kinds of products. Interestingly enough, there were similar trends away from the heavy construction frame and base to more equipment even within nonfarm residential construction.

STRUCTURE OF DOMESTIC CAPITAL FORMATION, BY CATEGORY OF USER

The distribution of domestic capital formation among households, business firms, and governments is crude, because we have to employ for this purpose the components already distinguished by type of capital good. Thus the share of households is identified with that of nonfarm residential construction, and is too small, in that it excludes farm housing. The share of governments is limited to government construction (local, state, and federal) and is too small, in that it excludes pro-

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ducers' durable equipment flowing to governments, and changes in government inventories. The share of business firms—a sum of "other" construction, producers' durable equipment, and net changes in inventories—is too large, in that it includes most of the items excluded from the other categories, as well as capital formation by nonprofit institutions. Yet, granting these defects in the classification, the broad trends differ little from those that would be revealed by a more accurate classification.

1. The share of the government sector rose, in both gross and net domestic capital formation, in both constant and current prices. The share in the gross totals rose from less than 5 per cent in the early decades to over 15 per cent in 1929–1955; the share in the net totals rose from less than 5 per cent to 24 or 28 per cent in 1929–1955, and to 15 or 13 per cent in 1946–1955. This rise would be somewhat greater if we could include durable equipment flowing to governments and changes in their inventories.

2. With this rise in the share of governments, the share of the private sector—a sum of households and business firms—declined, and the decline would tend to characterize the share of each of the two private user sectors. Of greater interest are the differences in trend between the two private sectors, in the long-term movements in the shares of households and of business firms in total private domestic capital formation. On the basis of the gross totals, the share of households declined: moderately for totals in current prices (from 24 per cent in 1869–1898 to 22 per cent in 1899–1928, to 21 per cent in 1929–1955, and to 21.5 per cent in 1946–1955); and more sharply for totals in constant prices (from 29 per cent in 1869–1898 to 23 per cent in 1899–1928, and to 18 per cent in both 1929–1955 and 1946–1955). The picture changes when we shift to net totals: for totals in current prices, the share of households shows a rise (moving from 30 per cent in 1869–1898 to 29 per cent in 1899–1928, to 40 per cent in 1929–1955, and to 38 per cent in 1946–1955); for totals in constant prices, however, the share of households again dropped, though rather moderately (moving from 38 per cent in 1869–1898 to 30 per cent in 1899–1928, to 34 per cent in 1929–1955, and to 32 per cent in 1946–1955). The decline (or rise in net, in current prices) in the share of the household sector in total private domestic capital formation is matched by a rise (or decline in net, in current prices) in the share of the business sector, although—to repeat—the shares of both private sectors in the totals including governments tended to decline.

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The marked rise in the share of the government sector in domestic capital formation—even when military items are excluded, as here—is closely associated with the rise in the share of governments in employment and other aspects of economic activity. The underlying factors are discussed in some detail elsewhere. Here we merely add that this trend in the allocation of capital formation is a combination of two variables. One, the rising share of governments in economic activity, is a result of the growing complexity of the domestic structure and of international relations, which compels the governments to assume greater responsibility for facilitating and supervising internal stability and growth and for assuring external security. The other variable, the relation between the volume of government activity and the capital needed for it, is a ratio that cannot be measured precisely, but it is not likely to be lower than the capital-output ratio for the private sector, and its trend may have made for a greater relative draft by governments upon capital investment. Further exploration in this direction calls for the long-needed scrutiny of the capital and income flows in the government sector, involving a functional analysis of government expenditures on both current and capital account.

On the rather disparate trends in the distribution of private capital formation between the household and business sectors, only general comments are appropriate here. First, if gross capital formation by the business sector and by households show the same rates of growth, we would expect the ratio of capital consumption to gross capital formation to rise more rapidly in the business sector, if only because of the shift from longer-lived construction to shorter-lived producers' durable equipment, and because of the reduction in the share of net changes in inventories in gross capital formation. Hence, we would expect the share of business in *net* private capital formation to decline, even though its share in *gross* private capital formation was constant or rising moderately—and this is what we find.

Second, prices of construction have risen more than prices of other goods—partly a reflection of the technological backwardness of that sector compared with industries turning out producers' durable equipment and even most consumer commodities. As a result, the trends in the structure of capital formation in current prices are markedly different from those in the structure of totals in constant prices. More important, the increase in relative prices of construction may be viewed as a causal factor in reducing the demand for its volume in

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constant prices relative to the demand for other components that have become cheaper. This, clearly, lies behind the greater drop in the share of the household sector (nonfarm residential construction) in the totals in constant prices than in the totals in current prices.

Finally, the volume of both business and household capital formation can be related to the number of ultimate consumers, via the demand for new housing and for additional quantities of other goods for whose production new business capital formation is needed. It was thus possible to show in Chapter 4 that the relative trends in household and in business capital formation can be reduced to trends in the number of ultimate consumers, in their demand for housing and other goods, and in the relevant capital-output ratios that link capital formation with the production of final goods.

SHARES OF SELECTED INDUSTRY SECTORS IN NET BUSINESS DURABLE CAPITAL FORMATION

For net flow of business construction and producers' durable equipment in 1880-1948, we can draw upon the several monographs to distinguish the shares of agriculture, mining, manufacturing, and the regulated industries. These accounted for about 80 per cent of net durable capital formation in the business sector in 1880, and have dominated that sector throughout the period. The trends summarized below are for shares in the total of these industries (the allocable total) in constant prices, and are observed over three subperiods, 1880-1900, 1900-1922, and 1922-1948.

1. The share of agriculture in the allocable total of net durable capital formation shows no decline, the percentages for the three successive subperiods being 12, 17, and 12. But these are lower than agriculture's share in the allocable *stock* in 1880-32 per cent; hence, the share of agriculture in the allocable stock declined—to 18 per cent in 1948.

2. The share of mining and manufacturing (combined) in the allocable total of net durable capital formation rose, from 38 per cent in 1880-1900 to 47 per cent in 1900-1922, and to 49 per cent in 1922-1948. These shares are appreciably higher than the sector's share in the initial stock in 1880-11 per cent; the sector's share in the allocable stock, therefore, increased—to 39 per cent in 1948.

3. The share of the regulated industries in the allocable total of net durable capital formation declined, dropping from 50 per cent in 1880-1900 to 36 per cent in 1900-1922, then rising to 38 per cent in

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1922–1948. These shares are all lower than the share of the sector in the initial stock in 1880—57 per cent; the share of the sector in the allocable stock, therefore, declined—to 44 per cent in 1948.

4. The trends in the shares of the sectors in net durable capital formation are different from the trends in their shares in volume of output or net product originating (also in constant prices). In both totals, the share of agriculture declined (in volume of output, from 36 per cent in 1880 to 10 per cent in 1948, and in net product, from 55 to 14 per cent). In both totals the share of mining plus manufacturing rose (in volume of output, from 59 to 74.5 per cent, and in net product, from 38 to 59 per cent). In both totals the share of the regulated industries rose sharply (in volume of output, from 5 to 15 per cent, and in net product, from 7 to 27 per cent).

5. The initially different distributions of net capital stock and of output, and the divergent trends in the shares of the sectors in net durable capital formation and in output result in wide differences among the several sectors in both the initial average capital-output ratios and their trends. The ratio of net capital stock (durable) to net income originating in 1880 was 1.7 for agriculture, 0.9 for mining and manufacturing combined, and as high as 23.6 for the regulated industries. By 1922, the ratio for agriculture had risen to 2.3, and that for mining and manufacturing to 1.8. While by 1948, the ratio for agriculture had declined to 2.0, and that for mining and manufacturing to 1.0, these terminal ratios were still higher than those in 1880. By contrast, the ratio for the regulated industries declined to 5.6 in 1922, and to 2.5 in 1948. This decline was large enough to dominate the total: the over-all ratio dropped from 3.0 in 1880 to 2.7 in 1922, and then precipitously to 1.6 in 1948.

6. There was clearly convergence among the major sectors with respect to their capital-output ratios: in 1880, they were 1.7, 0.9, and 23.6; in 1948, they were 2.0, 1.0, and 2.5, respectively. Convergence was also observed *within* these sectors in the detailed studies which distinguish regions in agriculture and industries within mining, manufacturing, and the regulated sector.

The few paragraphs above summarize the discussion in Chapter 4, which is, in turn, a summary of the more detailed analysis in the monographs. Upon the many findings presented in the monographs, two general comments are appropriate.

First, the rapidity with which capital-output ratios changed—even those for the major sectors—is impressive. To illustrate: the ratio for

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manufacturing rose from 0.8 in 1880 to 1.3 in 1900, a rise of more than one-half the initial value in two decades. It then declined from 1.58 in 1922 to 0.98 in 1948. In agriculture the ratio dropped from 1.7 in 1880 to 1.5 in 1900, and then rose to 2.3 in 1922, again, a rise of more than half its value in about two decades. And the speed with which the ratio declined in the regulated industries sector has already been noted. For narrower industrial divisions, the average capital-output ratio obviously changed at even greater rates, and when we shift from average to marginal ratios, both the trends and fluctuations become more prominent. Thus, even if we deal, as in this work, with averages over long periods, the capital-output ratios for separate sectors move quite rapidly. There is somewhat more stability in the nationwide ratios, but this means in essence that secular stability in the capital-output ratio is to be expected for wide aggregates and has little to do with the technological factors that have impact upon specific industries.

Second, the convergence among industries—the reduction in the range of the capital-output ratios—is clearly a significant phenomenon. Sectors that begin their growth with high ratios of capital to output, are likely to experience a rapid decline in their ratios, as extensive expansion of capacity intended for the long future subsides, and as the high ratio of capital per unit of output provides extra incentives for capital saving innovations. On the other hand, the emergence and growth of high capital-output ratio industries may, in and of itself, serve to raise the capital-output ratios in other industries, by facilitating greater mechanization and concentration, and by setting new patterns of business organization that extend the feasible scale of firm operation. It is hardly an accident that the growth of the regulated industries and the reduction in their capital-output ratios coincided with the greater industrialization of agriculture and mechanization of mining and manufacturing and the rise in the capital-output ratios of those sectors, at least to the 1920's. But such convergence has its limits. It is not unlikely that the next decades will show no further convergence, if new sectors with high capital-output ratios loom larger than they did during the recent decades.

Trends in the Share of Internal Financing (Chapter 5)

The attempt to establish meaningful trends in the financing of capital formation encounters two new obstacles. The first, and more obvious, is that our estimates extend back only to 1900, and financing flows are

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far more sensitive to wars, major depressions, and other disturbances than are capital formation and national product flows. With two world wars, a decade of cold war, and one of the greatest depressions on record—all within some five to six decades—the establishment of long-term trends is difficult, and the results perforce subject to serious qualification.

The second obstacle encountered is even more difficult to overcome. Financing is a process that can best be judged from the standpoint of the individual capital using unit—the household, the business firm, the government agency. Ideally, we should have data for each unit rather than aggregates, and they should cover periods short enough to be unaffected by cancellation of borrowing by repayment. Even then, the units would be found to use not only capital goods but also financial assets, with shifts from one type of asset to another and one type of liability to another. Unfortunately, our data are aggregates for large groups, canceling claims and obligations among units and over substantial time periods. Consequently, we can distinguish between internal and external sources of funds, not for each decision making unit, but only for large industry aggregates; we cannot reduce net changes in sources of funds to the underlying gross borrowing and repayment; and we can associate certain sources of funds with capital formation only by dint of somewhat unrealistic assumptions. More important, our estimates tend to overstate the share of internal financing and understate the share of external financing—as these are viewed by individual economic units; and the long-term movements they show reveal only part of the change that may have occurred in the structure of financing. They must, therefore, be treated as only a partial account of the trends in the relation between capital formation and the financing flows.

For business units, internal funds are capital consumption and depletion allowances plus net undistributed income—a total referred to as gross retention. For households, in connection with nonfarm residential housing, internal funds are the estimated equity shares in the cost of new housing (including land and major alterations), derived by subtracting from total cost the mortgage advances (and sales contracts, which are quite small). For governments, internal funds are derived as the difference between capital outlay and net borrowing, or between additions to assets and net changes in debt. In each case, the basic difference between internal and external financing is that the fund using units have greater discretion in regard to the former than the latter—since external financing involves a decision not only

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by the user but also by the lender. Unless otherwise indicated, we discuss here financing gross of capital consumption allowances, related, naturally, to gross capital formation or to total uses of funds.

1. For the economy as a whole, the ratio of internal financing to total uses declined, and correspondingly, the ratio of external financing to total uses rose—but the changes were moderate. From 1900 to 1929 the former averaged 0.53; from 1930 through 1955 it averaged 0.42. For selected normal periods, 1900–1909 (or 1901–1910), 1920–1929 (or 1921–1930), and 1945–1955 (or 1946–1956), it averaged 0.60, 0.58, and 0.56, respectively. The trend in the average ratio of gross retention to gross capital formation was also downward: it dropped from 0.72 in the first three decades to 0.61 in the last two and a half; and, over the selected periods, it moved from 0.78 to 0.76 and to 0.77.

2. This decline in the countrywide ratio of internal financing was associated largely with a decline in the ratio of internal financing for households (in connection with nonfarm residential housing) and for the federal government. In nonfarm residential housing, capital formation and total uses of funds are taken as identical, and the ratio of internal financing to that total declined from 0.44 in 1901–1930 to 0.28 in 1931–1955; or, in the three selected periods, from 0.65 to 0.37 to 0.27. For the federal government, the vast noncapital expenditures out of borrowed funds during the depression and World War II, and even in some of the later years, made for the decline in the ratio of internal funds to total uses or to capital formation (excluding military durables). Even in 1900–1929, internal funds were negative, averaging about $-\$0.2$ billion per year; in 1930–1955, they averaged close to $-\$7$ billion. This increase in the federal government's reliance on external financing contributed heavily to the rise in the share of external sources in the countrywide totals and thus to the decline in the share of internal sources.

3. By contrast, the trend in the ratio of internal financing for the business sector—the combined total of agriculture, nonfarm unincorporated business, and corporations—and for state and local governments was upward, though in some cases only moderately so. For the business sector, the ratio of internal sources to total uses rose from 0.59 in 1900–1929 (or 1901–1930) to 0.72 in 1930–1955 (or 1931–1956), but in the latter period the ratio was exaggerated by the peculiar experience of the depression and the war years. The ratio in the selected periods shows but a mild rise, averaging 0.59 in the first decade of the century and in the 1920's, and rising to 0.64 in the post-World War II

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years. The movement of the ratio of internal financing to gross capital formation was also upward. For state and local governments, the rise in the ratio of internal financing was more conspicuous: the average ratio to total uses rose from 0.52 in 1900–1929 to 0.80 in 1930–1956, and in the selected periods moved from 0.47 to 0.56 to 0.72. The ratio to gross capital formation also rose, and fairly continuously.

4. Within the business sector proper, the trend in the ratio of internal financing differed for the three major subdivisions. For agriculture, the trend was definitely upward: the ratio to total uses moved from 0.60 in 1900–1929 to 0.91 in 1930–1955, and in the three selected periods, from 0.72, to 0.66, to 0.83. The ratio to gross capital formation reveals similar trends. No such clear trend is observable for nonfarm unincorporated business. True, the average ratio of internal financing to total uses rose from 0.72 in 1900–1929 to 0.81 in 1930–1955, but in the selected periods it was 0.63, 0.78, and 0.63, respectively; and in the ratio to gross capital formation there is similarly no evidence of a rising trend. For both agriculture and nonfarm unincorporated business, the conclusions are affected not only by the fact that our estimates are limited to net aggregates but also by the relatively large volume of entries and exits. Exits from agriculture add to external financing if the retiring farmers, in selling their farms, convert their accumulated savings into debts of the purchasers in the form of mortgages on the hitherto unencumbered farms. Such additions to external financing have no connection with capital formation or uses of funds. Then, too, shifts of unincorporated units to corporate status tend to withdraw those units that have accumulated substantial internal funds, substantial relative to their uses. Internal financing ratios may be understated by these shifts in and out of the two sectors; but the effects on trends cannot even be conjectured.

5. For corporations, the dominant group of the business sector, the ratio of internal financing shows a slight upward trend. The ratio to total uses (nonfinancial corporations) averaged 0.57 in 1901–1929 and 0.67 in 1930–1956; and in the selected periods free from wars and major depressions, it averaged 0.55 (in 1901–1912), 0.55 (in 1923–1929), and 0.61 (in 1946–1956). The average ratio to gross capital formation (all corporations) was 0.91 in 1901–1929 and 0.97 in 1930–1956; in the selected periods, it was 0.85, 0.92, and 0.91, respectively.

6. For business corporations, we can also compare net retention (corporate savings) with net capital formation or net total uses, both unadjusted—as were the gross flows—for effects of changes in valua-

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tion of inventories or difference between cost and replacement bases of capital consumption. The ratio of net retention to net capital formation shows a slight upward trend, averaging 0.34 in 1901–1929 and 0.39 in 1930–1956, and in the selected periods, 0.33 (in 1901–1912), 0.28 (in 1923–1929), and 0.37 (in 1946–1956). The ratio of net retention to total uses shows no such rise, averaging 0.22 in 1901–1929 and in 1930–1956, and in the selected periods, 0.22, 0.17, and 0.23, respectively.

7. Among corporations, we have separate data for mining and manufacturing, and the regulated industries. In mining and manufacturing, the average ratio of gross retention to plant and equipment expenditures rose, from 0.88 in 1900–1914 to 1.04 in 1920–1929, and to 1.12 in 1946–1953. For large manufacturing corporations, the ratio of gross retention to total uses shows no distinct trend, averaging 0.70 in 1900–1910, 0.97 in 1920–1929, and 0.67 in 1946–1953, but the samples are too small (particularly in the early years) to warrant much confidence in the results. In the regulated industries, the trend is much more prominent: the ratio of gross retention to total uses averaged, roughly, 0.2 in 1901–1910 and 0.62 in 1941–1950.

Before we make any general comments upon the findings, the reader must be warned of the qualifications, which apply particularly to trends inferred from ratios in which changes over time are neither large nor consistent. With this caution, the following comments are offered.

First, one is impressed by the diversity of the trends in the internal financing ratios in the several sectors. In some, they decline quite markedly, as in nonfarm residential real estate and the federal government; in some, they rise appreciably, as in the agriculture sector, the regulated industries, and state and local governments; in still others, no marked trends are discernible, as in nonfarm unincorporated business, or the trends are only slightly upward, as in mining and manufacturing corporations. In addition, for some sectors, the trends differ as we take the ratio of internal financing to total uses—the more defensible comparison—or as we relate internal financing to capital formation alone. The diversity of trends reflects the differences in complexes of factors that determine the financing of capital formation or total uses in the several sectors—at least as revealed by our data. The forces that may have contributed to diminished reliance by households on equity funds and greater reliance on mortgages in purchasing nonfarm residential housing—the decline in the ratio of the value of house units to average income, the increasing stability of consumer incomes,

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the growing assistance of government guarantees, and the wider acceptance of consumer credit—are different from the forces that affect the ratios of internal financing of corporations and other business units. They are different also from the factors determining financing by the federal government. There are differences also between the factors determining financing by the federal government and those determining financing by the business sector. Even within the business sector proper, the factors that set the financing ratios for the major industry groups can differ widely.

Second, while disparate complexes of factors affect the financing ratios for the different sectors of the economy, those sectors are parts of a coordinate, operating system. What happens in one, must affect the others. Consequently, there are some lines of association among the different trends, and these too can be discerned. Thus, the factors that made for huge federal government deficits during the last two to two and a half decades and lowered the ratio of internal financing for that sector also made for improvement in the net income position of the agricultural sector. They permitted it and many industries within private business to earn their capital consumption allowances and to effect substantial net savings, which helped raise their internal financing ratios. The same factors, contributing as they did to greater stability of consumer incomes as well as to rising price levels, made possible greater reliance on external financing by households in connection with nonfarm residential housing. In other words, behind the declining shares of internal financing in some sectors and the rising shares in others there were common factors. As a result, the financing ratios for the country as a whole tended to be more stable in the long run than those for the individual sectors.

Finally, there is a seeming contradiction between the marked rise in the ratio of capital consumption to gross capital formation, observed in Chapter 4, and the rather moderate rise in the share of internal financing for the economy, when we exclude the federal government with its use of capital funds to cover current expenditures. Earned capital consumption allowances should represent internal financing; and a marked long-term rise in their ratio to gross capital formation would lead us to expect a sizable rise in the share of internal financing. Yet even for the business sector, the upward trend in the share of internal financing is moderate relative to the rise in its ratio of capital consumption to gross capital formation.

There are essentially two reasons for the difference. One is that the

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financing ratios cover only the period since 1900—not since 1869—and for that shorter period, the rise in the ratio of capital consumption to gross capital formation was not so large as for the longer period. The second is that our analysis of capital formation deals with totals adjusted for inventory valuation changes and the difference between the cost and replacement bases of capital consumption allowances. In the analysis of financing, however, we emphasized the unadjusted totals, in which the general rise in prices tends to reduce the rise in the ratio of capital consumption allowances to capital formation (both in constant prices). While that reduction in the rise of the ratio of capital consumption should presumably be offset by a rise in the ratio of net undistributed profits, a complete offset apparently did not occur—at least so far as our estimates for corporations indicate. Thus, whereas in the adjusted totals the average ratio of gross retention to gross capital formation rose from 0.72 in 1897–1914 to 0.88 in 1940–1956 (or 0.81 in 1946–1956), in the comparable unadjusted totals (differing somewhat from those utilized above) the ratio rose from 0.71 to 0.83 (or 0.78)—12 instead of 16 (or 7 instead of 9) points. Finally, in relating gross retention to total uses (rather than to gross capital formation), we included changes in financial assets, usually short-term; and external financing is far more dominant in the financing of those assets than it is in the financing of gross capital formation.

Trends in the Structure of External Financing (Chapter 6)

External financing of an economic unit means provision of funds from the outside, either equity in the form of stocks, or debt financing—long-term or short-term. Such financing may flow directly from the lender to the user, or via financial intermediaries (banks, insurance companies, etc.). The detailed discussion of long-term changes in such financing can best be summarized if we deal separately with trends in: (1) distribution of external financing, by category of user of funds; (2) share of equity financing; (3) long-term and short-term debt financing; (4) shares of financial intermediaries.

DISTRIBUTION, BY CATEGORY OF USER OF FUNDS

1. In the distribution of the economy's total external financing, the striking rise in the share of the federal government is the dominating trend: the share rose from an average of 0.08 in the first three decades

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of the century to an average of 0.49 in the last two and a half. For the three selected periods (the first decade in the century, the 1920's, and the post-World War II years), the rise was less striking but still marked, the average ratio moving from 0.01, down to -0.09 , and up to 0.11. For the selected periods, the average share of the household sector (nonfarm residential housing) also rose, moving from 0.17 to 0.33 and to 0.25. The share of state and local governments tended to be stable in those periods, the average share being 0.09, 0.13, and 0.09, respectively. The shares of the other sectors—agriculture, corporations, nonfarm unincorporated business—declined.

2. The average share of households in total private external financing rose markedly, from 0.26 in the first three decades to 0.35 in the last two and a half, and moved from 0.19 to 0.34 to 0.32 in the three selected periods. The average share of corporations shows no distinct trend, remaining at a level close to 0.60. That of agriculture declined markedly; that of nonfarm unincorporated business declined only slightly.

3. Within total external financing for the business sector, corporations were dominant, accounting for two-thirds to almost nine-tenths, disregarding the World War II years. The trend in their average share was upward, from about seven-tenths in the first two decades of the century to close to nine-tenths either in the 1920's or in the post-World War II years. The shares of agriculture and nonfarm unincorporated business declined.

These trends in the distribution of total external financing among users are due to a combination of the trends in the external financing ratios within each sector with the trends in the shares of the sectors in total uses or total financing for the country. Thus, the decline in the share of the business sector in total external financing is a product of the decline in the share of external financing within the business sector (discussed in Chapter 5) and the slight decline in the share of the sector in total uses (which changed from an average of 0.7 in the first decade of the century to somewhat over 0.6 in the 1920's and in the post-World War II years). Much of the discussion in Chapter 5, as well as in Chapter 4 (on the shares of users in gross capital formation), is relevant here in accounting for the trends summarized above.

SHARE OF EQUITY FINANCING

We can study equity financing only in the form of net stock issues—for the corporate sector alone. For the unincorporated sectors, equity

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funds may be contributed by various informal arrangements, but we cannot gauge their volume or ascertain their precise character.

1. For all nonfinancial corporations, the share of net stock issues in total external financing declined, although not consistently: it averaged 0.35 in the first three decades and 0.27 in 1930–1955, rising from 0.31 in the first period of the century to 0.43 in the 1920's, only to decline sharply to 0.21 in the post-World War II decade. The share in all long-term external financing (i.e., excluding short-term debt financing from the denominator) moved similarly, but the decline was not as marked: the movement was from an average of 0.46 in 1901–1929 to 0.43 in 1930–1955, and in the three selected short periods (1901–1912, 1923–1929, and 1946–1955), from 0.38 to 0.47 and to 0.34.

2. The trends in the shares of net stock issues in either total external or long-term external financing can also be studied separately for the mining and manufacturing corporations and for those in the regulated industries (referred to as public utilities). For both groups these trends were downward, although they were no more consistent over time than those for nonfinancial corporations as a whole.

3. The share of equity financing in external financing—measurable here only for stock issues—can be studied for all business, for the private sector, and for the economy as a whole. In every case, the share of equity financing declined in the long run. For example, the share in total external financing for the country dropped from an average of 0.17 in 1900–1929 (or 1901–1930) to 0.07 in 1930–1955 (or 1931–1956), and moved from an average of 0.12 in the first two decades to 0.20 in the next two, and to 0.07 in the last decade and a half.

In the attempt to explain the trend in the share of equity financing, it is best to emphasize its share in long-term external financing, which excludes the possible effects of a rise in short-term debt (summarized below). The question, then, is why the use of equity funds by corporations declined relative to long-term external financing—a question that may seem all the more puzzling since the large corporations are in the best position to issue stocks, and the weight of the larger firms in the corporate total must have increased.

The answer suggested in the detailed discussion notes the recent disparity in cost in favor of long-term debt relative to equity money (yield of stocks), the tax advantage of deductible payments on fixed debt, as well as the increasing willingness of corporations to assume such debt in view of their stronger position and of the general expectation of rising prices. While all these are relatively recent factors, so

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is the decline in the share of equity financing in long-term external financing. As to the possible effect of the growing proportion of large corporations in the direction of raising the share of net stock issues, it may have been offset not only by their greater willingness to assume long-term debt obligations, but also by the possibly increasing share of internal financing in total financing within these larger units. Hence, their growth meant less than a proportional contribution to long-term external financing—whether equity or debt.

LONG-TERM AND SHORT-TERM DEBT FINANCING

Short-term debt is limited here to notes and accounts payable, because short-term bonds and notes (maturing within five years) could not be segregated from other bonds and notes before 1919. Consequently, short-term debt is understated and long-term debt overstated, although for most periods and for a definition that limits short-term debt to not much more than two years, the unwarranted shifts in proportions are rather minor.

1. For all nonfinancial corporations, the ratio of short-term debt financing to all external financing rose, averaging 0.22 in the first three decades and 0.38 in 1930–1955, and in selected periods (1901–1912, 1923–1929, and 1946–1955), 0.18, 0.09, and 0.37, respectively. This means that the trend in the ratio of long-term external financing (equity and debt) to total external financing was downward. The ratio of short-term debt financing to all debt financing also rose, from an average of 0.34 in 1901–1929 to 0.52 in 1930–1955 and, in the selected shorter periods, moved from 0.27 to 0.16 to 0.47. For the mining and manufacturing corporations, there were similar movements in the ratio of short-term debt financing to either total external financing or to total debt financing.

2. For agriculture, we classified debt to banks, federal agencies, and others as short-term, and mortgage loans as long-term. On this definition, the ratio of short-term debt financing to external financing or to total debt financing (the two are identical for unincorporated sectors because there are no equity issues) rose: it was roughly 0.3 in the first three decades and somewhat over 0.6 in the last two and a half, and moved from 0.5 in 1900–1914 to 0.6 in 1945–1955. As in the case of corporations, however, the movement was not consistent over time.

3. For nonfarm unincorporated business, the trend in the ratio of changes in short-term debt (debt to banks) to total debt financing or to total external financing is in doubt. The ratio did rise from an aver-

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age of 0.43 in the first three decades to 0.56 in the last two and a half, but the movement was not consistent over time and the estimates are not very reliable.

4. For the business sector as a whole, the trend in the ratio of short-term debt financing to total external financing was upward. The same is true for the private sector (business firms and households). The picture changes with the inclusion of governments for which all debt is treated as long-term, since the distinction between long-term and short-term was not possible for the early years, and is much less significant than for the private sector. For the country as a whole, the ratio of short-term debt financing to total debt financing or to total external financing shows little or no rise, averaging 0.23 or 0.21 in the post-World War II decade compared with 0.23 or 0.19 in 1901–1912 or 1900–1914.

The rise or lack of rise in the ratio of short-term debt financing to external financing or to total debt financing in the private sector may be due either to trends in the differential cost and availability of short-term versus long-term credit, or to trends in the ratio of short-lived assets and in the related ratio of such assets to external financing. If it could be shown that either the trend movements or even the changes from period to period in the ratio of short-term debt financing relative to long-term were associated with relevant changes in differential cost and availability, at least a tentative explanation could be claimed. But the comparisons in the detailed discussion do not confirm this hypothesis. The ratio of short-term debt financing generally did not rise when the differential cost of short-term credit declined, nor did it decline when the differential cost rose. The alternative hypothesis seems more relevant: for corporations and for agriculture, there is a much closer association between changes in the ratio of short-term debt financing to total debt financing (or to total external financing) and those in the ratio of changes in short-term assets (inventories and financial claims) to changes in long-term assets (durable real assets). And if we associate internal financing with long-term assets alone, we can also calculate the ratio of changes in short-term assets to external financing and observe that its changes are correlated with those in the ratio of short-term debt financing to external financing. The rationale for these correlations is clear. First, the acquisition of a short-term asset by an economic unit can more easily be financed by short-term than by long-term funds. Second, for an aggregate which includes both borrowers and lenders, the very rise in the relative share of financial

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claims (classified as short-term assets) means *pari passu* a rise in the weight of short-term debt. Thus, if a manufacturing corporation acquires notes receivable through a sale to another manufacturing corporation, both notes receivable and notes payable in the manufacturing sector rise.

SHARES OF FINANCIAL INTERMEDIARIES

The intermediaries here comprise banks (Federal Reserve, commercial, mutual savings banks including the postal savings system, and savings and loan associations); insurance companies (private life, private and public pension funds, casualty, fire, and so on); and a miscellaneous group ranging from mortgage companies, investment houses, brokerage firms, etc., to government lending institutions, and personal trust departments.

1. The share of financial intermediaries in countrywide external financing rose from 0.44 in 1900–1929 to 0.65 in 1930–1949 and, in selected periods (1901–1912, 1923–1929, and 1946–1949), from 0.48 to 0.49 to 0.68. But their share in countrywide total financing also rose, from 0.21 in the first three decades to 0.38 in the last two and a half, and in three selected decades (the first of this century, the 1920's, and the post-World War II years), from 0.19 to 0.21 to 0.30.

2. The rise in the share of financial intermediaries in external financing was pervasive, occurring in the external financing of most of the major users: state and local and federal governments; households—although not continuously; nonfinancial corporations; and, with less consistency, agriculture, and nonfarm unincorporated business. This was not as true of the share of financial intermediaries in total financing, simply because in some sectors the ratio of external to total financing declined, and that tended to offset the increased importance of financial intermediaries in providing external funds. Thus, for the business sector as a whole, the average share of financial intermediaries in total financing changed from 0.17 in the first three decades to 0.15 in the recent two and a half. It was the household and government sectors that accounted for the rise in the share of financial intermediaries in total financing for the country as a whole.

3. There were distinctive trends in the structure of financial intermediaries, weighted by the size of their assets. In total assets of all intermediaries, the shares accounted for by commercial banks, savings banks, and personal trust departments declined, and it was the drop in the shares of the first two that reduced the share of the banking sector

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from an average of somewhat over six-tenths in the first two decades of the century to less than four-tenths in the post-World War II years. The shares of the various groups of insurance and retirement funds rose. The share of the insurance sector as a whole also rose, from an average of almost one-sixth of the total before the 1930's to almost four-tenths in the post-World War II years. Within the miscellaneous group, the shares fluctuated and the long-term trends are not clear. The share of land banks and of the combined group of investment companies, stock brokers, and investment-holding trusts and factors apparently declined; that of government lending institutions rose. But only the latter trend is clearly significant. Finally, we note the rise in the average share of government institutions (Federal Reserve Banks, government lending institutions, government pension and security funds), from 7 per cent in 1901-1922 to 21 per cent in 1913-1939, and to 27 per cent in 1930-1955.

The changing role of financial intermediaries in the financing of this country's economy has been discussed in detail in Raymond Goldsmith's monograph,¹ and we need not go beyond the thumbnail summary above. Some brief general comments, however, are in order.

First, the rise in the shares of financial intermediaries in external and total financing reflects their increased use by individuals and households, the main source of the nation's savings. This long-term shift in what might be called the financial habits of ultimate savers (including also unincorporated enterprises, and even corporations) is a result of far-reaching changes in the pattern of economic and social life. To illustrate: the increase in the proportion of employees and the decline in the proportion of self-employed in our working population meant a shift from savings flowing directly into the saver's business to savings that are generally deposited by the employee-saver in some financial intermediary. Likewise, the increase in urbanization meant easier access of the population to the financial institutions, and the multiplication of facilities also encouraged greater use of financial intermediaries by ultimate savers. We should, therefore, have expected to find many of the trends summarized above even if there had been no marked changes in the distribution of income by size, no decisive increase in the size and diversity of government institutions, no marked shift toward security orientation in the channeling of savings.

Second, these shifts did occur, however, and are clearly reflected in

¹ *Financial Intermediaries in the American Economy since 1900* (Princeton for NBER, 1958).

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the trends in the structure of financial intermediaries. It need not be emphasized that the shifts not only meant changes in the relative weights of various types of intermediaries but also contributed to a rise in the shares of all intermediaries in total and external financing. If reduction in the share of upper income groups in income lowered the proportion of savings seeking venture capital investment, it also lowered the share of savings channeled directly through purchase of stocks rather than through intermediaries. Likewise, the quest for security, leading as it did to shifts among intermediaries, also meant a moving away from the direct channeling of savings into investment.

Finally, insofar as there were these distinctive shifts in the movement of ultimate savings through channels other than those prevailing earlier, there may have been shifts in the forms of financing discussed above. If either the ultimate savers or the financial institutions to which they entrust their savings are committed to channel the funds into certain types of investment only (say long-term fixed debt), the resulting effect on differential costs of alternative types of financing may influence the would-be users' choice. Conversely, the pressure of an important user, like the federal government, for marketing its fixed-interest securities may cause the shifting of funds from one type of financing to another, or even between direct and indirect channeling of savings. The trends in the shares and structure of financial intermediaries are, therefore, associated with those in the structure of external financing.

The Long Swings (Chapters 7 and 8)

In addition to the trend movements that can be observed over periods longer than twenty-five or thirty years, there are swings in the growth rate or even in the absolute volume of many important economic components. These swings, approximately twenty years long, are quite distinct from business cycles and must be considered in any discussion of long-term changes in the economy.

The statistical evidence on these swings is of two types. For many economic variables, such alternations in the rate of change are so prominent that continuous annual or quinquennial series show them directly, without any statistical manipulation of the original record. This is true—to cite a few cases—of gross nonfarm residential construction; of gross durable capital expenditures by railroads; of net changes in inventories (a partly conjectural series); of net changes in

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claims against foreign countries; of net additions to total population; of net immigration; of internal migration of the native born; of stock market prices, and of stock yields. For almost all of these, the evidence extends back to the 1870's; and, for those for which evidence is available for years before the Civil War, there is clear indication of the existence of long swings even in the earlier decades.

For other economic components, the long swings are not so prominent and may be overshadowed either by trend movements or by shorter-term changes associated with business cycles. In such cases the long swings become apparent when the series is smoothed by a moving average and plotted on a ratio scale, which reveals the alternations in the percentage rate of growth. But it must be stressed that the long swings brought to light by this treatment of the series are not statistical illusions—a mere product of the statistical procedures. It is true that a major short rise or decline much above or below the underlying trend—extending over a single year or two, or over a single business cycle—would affect all the ordinates of the moving average in which it is included, and that average would thus stretch out a short change into a long swing. But economic theory leads us to expect that—other factors being absent—such short breaks would be followed by a canceling reaction. Thus, the lack of such a reaction would in itself indicate the existence of a long swing. Likewise, long swings in the percentage rate of growth are no less real than those in the absolute volume of an economic process.

The main difficulty in our discussion of long swings is not in establishing their existence or their wide amplitude in some important economic variables, but in explaining them, in uncovering the links in their transmission. In recent decades, for which data are more plentiful, two major wars and the Great Depression (in large part, a post-war maladjustment) affected the long swings so clearly that it is all too easy to interpret them as war and war-conditioned phenomena. But such an explanation is obviously inapplicable to the decades before World War I. For earlier decades when no major wars occurred, our data are scanty, and cover only two long swings back to the 1870's—not a large sample to rely upon. Some previous studies of these movements have been made, but our detailed discussion in Chapters 7 and 8 and the summary below are, perforce, limited to empirical findings with only suggestions of a few explanatory links.

1. Additions to total population, net immigration, net excess of births over deaths, and net internal migration of the native born dis-

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play long swings approximately twenty years in duration. Although some of the series are annual, others are quinquennial or even decennial, and no precise timing study is possible. It is clear, however, that the amplitude of the swings is wide and has widened in recent decades.

2. Nonfarm residential construction and durable capital expenditures by railroads (both gross, in constant prices) display long swings roughly coincident with (or lagging slightly behind) those in population additions, immigration, and net internal migration—and presumably in response to these population movements. Similar swings may characterize other population-sensitive components of capital formation (such as construction of stores, offices, and some public utilities other than railroads), but these components cannot be segregated over a period long enough to serve the present analysis.

3. Until the 1920's, these long swings in population growth and in population-sensitive capital formation were coterminous with opposite swings in other capital formation—total, and in such components as net changes in inventories, net changes in foreign claims, and perhaps “other” private construction and producers’ durable equipment combined (excluding capital expenditures by railroads). But the negative association between the long swings in population-sensitive and other capital formation shifted to a positive association beginning with the 1920's, suggesting that the factors that set limits before the 1920's and prevented synchronous acceleration in both population-sensitive and other components of capital formation ceased to be operative after World War I.

4. The inversion of long swings in other capital formation to those in population additions and population-sensitive capital formation before the 1920's, and the difference in timing between long swings in additions to the labor force and those in population affected the long swings in additions to gross commodity product (gross national product, excluding services) and additions to the flow of goods to consumers, total and per capita. In particular, the long swings in additions to flow of goods to consumers per capita tended to be inverted to those in additions to population and in net immigration, although with some lag—at least before the 1920's. There is thus a suggestion of a mechanism by which swings in population additions produced opposite swings in the capacity to add to consumer goods per capita; and the opposite swings induced a reversal in the swings in popula-

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tion growth and immigration (the upswing in immigration being a response to the pull of this country as reflected in additions to consumer goods per capita). This, however, is a bare suggestion and there were, most likely, many other factors operating. Moreover, the association ceased after World War I.

5. Gross national product and flow of goods to consumers, total and per capita, all reveal long swings whose relative amplitude tended to widen. There were, naturally, similar swings in net national product, total and per capita. But the long swings in total capital formation, gross and net, become evident only in recent decades, because in the earlier decades the movements in the population-sensitive and in the other components offset each other.

6. It follows that the ratio of gross capital formation to gross national product—whether average or marginal—displays the long swings prominently; and so does the ratio of net capital formation to net national product. These swings, until the recent decades, were inverted to those in gross and net national product.

The findings above relate to real flows—the volume of production in constant prices—and to the population and labor force. For the swings in financial flows the data are even scantier and we must supplement them by some indirect evidence.

7. There are long swings in the structure of capital formation, in current prices, i.e., in the shares of various user sectors, in the apportionment by type of capital good, and in the ratios of capital consumption allowances and net capital formation to gross capital formation for durable types of business capital. Insofar as these components are subject to or represent different types of financing—internal or external, or different types of external financing—long swings in their shares imply corresponding swings in the structure of financing. But our data do not permit us to observe these long swings in the structure of countrywide financing directly, except for the recent decades when the effects of wars dominate the picture (and the period covered is too short for our purpose, anyway).

8. There were clearly marked long swings in stock market prices and stock yields back to the 1880's, when our series begin. This finding can be brought to bear upon long swings in financing by calculating for at least two groups—railroads, and mining and manufacturing corporations—the swings in the ratio of stock yields to bond yields. A

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comparison of that ratio with the ratio of net stock or net bond issues to total net issues for the two corporate groups reveals the expected association: in most cases, a long upswing of the differential that makes bonds relatively cheaper is associated with a long upswing in the ratio of net bonds to total net issues, and vice versa. The data are crude and the conclusion necessarily tentative. However, the comparison does suggest that the association is present, and that long swings in the differential cost of bonds and stocks are roughly synchronous with similar movements in the bond-stock ratio in net issues.

9. Finally, for agriculture, mining and manufacturing corporations, and nonfarm residential construction, we can observe financing ratios for time units short enough to reveal whether long swings exist. For agriculture, we have quinquennial data back to 1900, and total uses do reveal swings—although markedly only in recent decades. More important, these swings are related to those in the financing ratios. An upward movement in total uses or in capital formation is associated with a similar movement in the external financing proportion and an opposite movement in the internal financing ratio; a downward movement in total uses or in capital formation is accompanied usually by a decline in the external financing proportion and a rise in the internal.

10. For mining and manufacturing corporations, we observe long swings in plant and equipment expenditures and can study the ratio of gross retention and of net security issues to those expenditures. Here again, even more clearly than in the case of agriculture, long swings in capital formation are accompanied by similar swings in the ratio of net security issues (external financing) to capital formation, and by inverted swings in the ratio of gross retention to capital formation. And the long swings in nonfarm residential construction also appear to be positively associated with swings in the ratio of external to total financing, and negatively associated with swings in the ratio of internal to total financing.

One final general comment on this problem of long swings is appropriate. There is little doubt about the existence of such movements in some major economic flows in the past. And if some important economic flows reveal such swings prominently, the very association between these flows and other processes of the economy is likely to induce similar (or opposite) swings elsewhere. Alternations in gross capital formation are likely to induce swings in capital consumption, in the ratio of the latter to gross capital formation, and hence possibly

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in the ratio of gross retention or internal funds to capital formation or to total uses. In short, the association among the real flows, and between them and the financial flows, both in space and in time, would lead us to expect that long swings found to be conspicuous in some real flows would be transmitted, though with modification, to other parts of the country's production and its financial framework.