

Social Security, Saving, and Capital Formation

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Much controversy has developed recently over capital formation and the claim that the social security system has reduced savings and as a result the potential for economic growth in this country. Concerned that there was much misunderstanding with respect to the subject, the Commissioner of Social Security asked the Office of Research and Statistics to make a presentation to top-level staff to clarify the concept, stimulate intelligent discussion, and place the issues in proper perspective.

This article is based on the presentation made at the Executive Staff Meeting on April 18, 1975. To facilitate understanding of the issues, the article begins with a discussion of the general nature of capital formation and its relationship to saving and economic growth. The balance of the article focuses on three questions: What is the impact of social security on saving? If social security reduces saving, is this necessarily bad? If it is desirable to increase saving and economic growth, what alternative policies can be considered?

. . . the OASDI system has affected the capital formation of the country and will continue to affect it in ways that are not clearly understood at this time . . .

—Advisory Council on Social Security, 1975.

IN RECENT MONTHS, editorials and scholarly articles have appeared criticizing the social security system for reducing saving and capital formation. This article presents a review of the relationship of social security to saving and capital formation. The main concern is with the impact of the social security program on saving and capital formation. Does social security reduce saving? If it does, is that bad? If it is bad, what should be done? These questions are addressed in the second part of the article.

The issues can be discussed more easily if the general nature of capital formation and its relationship to saving and economic growth are first understood. What is capital formation? How does it take place? What is its relationship to economic

growth? These basic concepts are discussed in the first section of the article.

CAPITAL FORMATION, SAVING, AND ECONOMIC GROWTH

Capital formation plays a dual role in the economy. In the short run, capital formation is an important and volatile component of aggregate demand. In the long run, capital formation adds to productive capacity and contributes to economic growth. The focus here will be on the role of capital formation in increasing the productive capacity of the economy.

What do we mean by capital and capital formation?

Every society has limited productive resources—land, minerals, machines, buildings, workers of various skills—to satisfy its wants. These resources may be used to satisfy current wants by producing food, clothing, concerts, ball games, and similar goods and services. Alternatively, resources may be used to produce machinery, factories or houses; to find mineral deposits; to build roads and dams; to educate and train workers; and to investigate scientific problems and develop new technologies—uses that do not satisfy current wants but do expand future consumption possibilities.

In its broadest sense, capital formation is the use of resources to expand the productive capacity of the economy, including both physical capital—buildings, machines, roads, inventories—and intangible capital. The latter includes both human capital—individuals with their embodied knowledge and skills—and society's accumulated stock of knowledge.

There is a more limited view of capital formation that is reflected in most empirical studies

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of capital formation. This narrower view excludes investment in human beings and, with the exception of dwellings, household durables. Those conceptual frameworks that consider the output of government as consumption also exclude public capital—government buildings, dams, roads, etc.

Under the narrower concept, capital consists of produced goods that are used as inputs in the productive process—factories, machinery, inventories, and dwellings. Net capital formation is the net addition to the capital stock after allowing for the using up of existing capital goods. For some purposes it is useful to refer to gross capital formation, which is the addition to capital stock before allowing for capital consumption.¹

In 1974, net capital formation was \$89.4 billion, or 7.0 percent of net national product. Gross capital formation was \$208.9 billion, 15.0 percent of gross national product. Because 1974 was a recession year, these proportions are somewhat below historical averages.

Real investment must be distinguished from financial investment.

In economic analysis, “capital formation” and “investment” are used synonymously and the terms are used here interchangeably. This point is stressed because in everyday language, “investment” frequently refers to the accumulation of financial assets—such as stocks and bonds—or existing real assets—such as real estate or paintings.

For the economy as a whole, the accumulation of financial assets does not represent an increase in real wealth. Every increase in financial assets held by one household or business is exactly offset by a reduction in financial assets held by, or increase in liabilities of, another economic unit. Similarly, the purchase of existing—that is, previously produced—real assets represents transfer of ownership, not a net addition to the economy’s stock of real capital. In the use of the term here, investment refers only to *real* capital formation—the current use of resources to produce new capital goods.

Capital formation requires that society choose between present and future consumption

At any point in time, the capital stock available to a society consists of its accumulated inheritance from past economic activity. To add to—or simply maintain—this capital stock, society must use part of its potential output for capital formation rather than present consumption.

Capital formation requires that society choose between present and future consumption. That is, if labor and other resources are fully employed, and if we want to increase future output by producing capital goods, then we must forgo present consumption. Further, the more output we want in the future, the more resources we must devote to capital formation and the less to present consumption. The real cost of adding to the stock of capital to produce goods tomorrow is the sacrifice of consumption today.

It is important to note that if there are unemployed productive resources, society does not have to give up current consumption to obtain more capital formation. That is, the unemployed labor, machinery, and other resources can be used to increase production of both consumer goods and capital goods.

Every society must somehow choose between present and future consumption. In an economy such as ours, private capital formation—factories, machinery, houses, etc.—is essentially the result of individual decisions to save and invest, which are coordinated by a complex system of market institutions. Government policies—taxes, subsidies, regulations—have an important effect on these private decisions to save and invest.

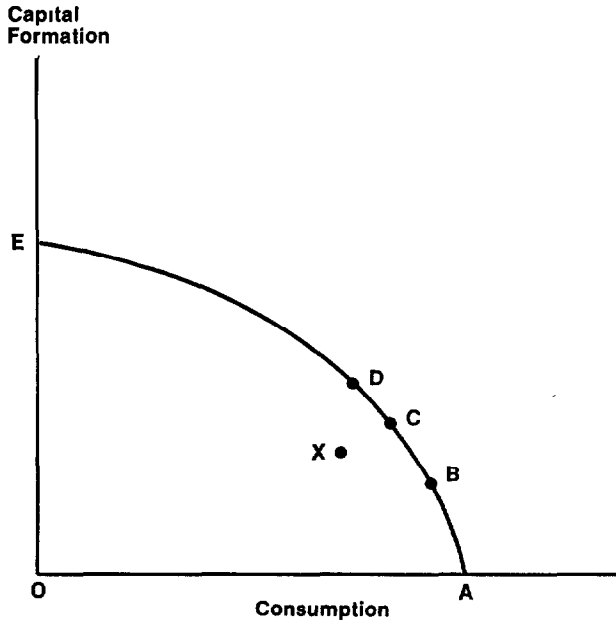
The problem of choice can be illustrated graphically.

If an economy is to increase its future consumption by devoting part of its productive resources to capital formation, consumption must be reduced in the present. This problem of choice may be illustrated by the use of a “production possibility curve” (chart 1).

Suppose that an economy may use its resources for either consumption or capital formation. If all resources are used to produce consumer goods, we may have OA of consumption. If all resources are devoted to investment, we may have OE of capital formation. The curve ABCDE traces out

¹ Although net capital formation is often the preferred concept, empirical studies generally use gross capital formation. Estimates of gross capital formation are more accurate than those of net capital formation because it is very difficult to obtain reliable estimates of capital depreciation.

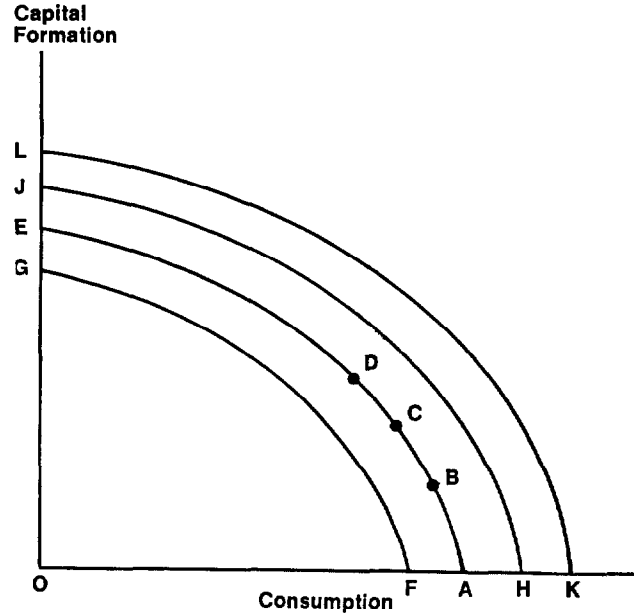
CHART 1.—Production possibilities of capital formation vs consumption



all possible combinations of consumption and capital formation that the economy could produce on a normally sustained basis by using all land, labor, and capital equipment. Its curvature reflects the increasing opportunity cost of the alternative output and reflects the fact that resources are not perfectly substitutable in the production of consumer goods and capital goods. The graph shows clearly that increased capital formation is obtained only at the sacrifice of present consumption. It should be noted that, if resources are unemployed, and we are at a point such as X, we can increase both consumption and capital formation.

The problem of choice over time is brought out more clearly in chart 2, in which ABCDE again represents the production possibilities of period 1. If A is chosen, with all resources devoted to consumption, capital wears out and is not replaced. With less capital, the production possibilities for period 2 are only FG. Suppose that, if B is chosen, net capital formation is zero—we simply replace capital used up. Then the production possibilities for period 2 are identical with those of period 1. Choices C and D represent positive capital formation. If C is chosen, HJ is possible in period 2; with D, it is KL. Clearly, the more potential consumption

CHART 2.—Effect of capital formation on production possibilities over time



wanted in period 2, the more consumption must be given up in period 1.

How does capital formation take place?

Capital formation requires resources—labor, machinery, materials—to produce capital goods. How do the producers of capital goods obtain these resources?

Saving releases resources—investment absorbs resources.

If individuals used all of their incomes for consumption, all productive resources would be involved in the production of consumer goods. However, individuals save part of their incomes. They save for a multitude of reasons—to provide for retirement, to leave an estate, to provide for emergencies, or simply to accumulate wealth. When individuals in the aggregate refrain from consuming, the resources that would be used to produce consumer goods are released. The resources released from consumer goods industries can then be shifted to the capital goods industries to produce factories, machines, etc.

Capital markets coordinate the saving-investment process.

In some cases, the units that save are identical with those that invest. Independent businessmen save in order to finance investment. Corporations finance the purchase of capital goods by retaining earnings. In large measure, however, saving and investing are done by different units. That is, saving is done primarily by individuals and families; capital formation is carried on largely by business firms.

The transfer of saving from individuals to business firms is coordinated by the capital market—a complex system of financial intermediaries dealing in a multitude of financial instruments. Individual savers may purchase new or old securities, accumulate cash, pay debts, etc. In the aggregate, saving is used to purchase new securities issued by business firms. The business firms that issue these new securities use the proceeds from their sale to purchase newly produced capital goods.

What is the relationship between capital formation and economic growth?

Capital-using production is indirect. To produce automobiles, we need steel. To produce steel, we need blast furnaces and iron ore. To produce iron ore, we need mining equipment, etc. We must also educate and train workers so that they are capable of handling complex tasks, whether it is assembling an engine part, planning production schedules, engineering a new part, or designing a new plant.

Roundabout processes need not be productive, as many a Rube Goldberg cartoon has shown. The empirical evidence provides strong support, however, that such processes are highly productive.

Growth of output is related to growth of capital.

If the American experience is examined in historical perspective, rising output is seen to be associated with a rising stock of capital. A study by Simon Kuznets of Harvard University² shows that from 1869 to 1955, total capital (measured in 1929 dollars) increased from \$36 billion to \$649 billion, an increase of 40 percent per decade.

² Simon Kuznets, *Capital in the American Economy*, National Bureau of Economic Research, Oxford University Press, 1961.

TABLE 1.—Source of growth of potential total real output,¹ 1939–69

Item	Percentage points in growth rate	Percent of growth rate
Increase in total output.....	3 41	100 0
Increase in total input.....	1 82	53 4
Labor, adjusted for quality change.....	1 32	38 7
Employment.....	1 09	32 0
Change in hours of work.....	-. 22	- 6 5
Education.....	. 41	12 0
Other factors.....	. 04	1 1
Capital.....	. 50	14 7
Increase of output per unit of input.....	1 59	46 6
Advances in knowledge.....	. 92	27 0
Economics of scale.....	. 36	10 6
Improved resource allocation.....	. 30	8 8
Other.....	. 01	. 3

¹ Output is measured by national income. Potential output adjusts actual output for demand-related factors

Source E. F. Denison, *Accounting for U.S. Economic Growth, 1929–1969*, The Brookings Institution, 1974, table 9–4, page 127, and table 9–5, page 128.

During the same period, capital per worker rose from \$900 to \$3,780, a growth of 16 percent per decade.

Net national product in 1929 prices grew from \$13.3 billion in 1869–88 to \$149.8 billion in 1946–55, an increase of 39 percent per decade. Net national product per worker increased from \$792 per worker to \$2,414 per worker during this period—an increase of 15 percent per decade.

Growth cannot be accounted for simply by the quantitative increase in labor and capital.

Economists have attempted to divide sources of growth into its components. Almost all these studies find that after accounting for growth in labor force and capital, there is an unexplained “residual.” This residual reflects increased output per unit of input and is largely attributed to technical progress.

According to Edward Denison of the Brookings Institution,³ the sources of growth of total U.S. output for 1929–69 are summarized in table 1. It is striking that the increase in capital input contributes only 15 percent of observed growth. The major sources are advances in knowledge (27 percent) and increases in education (12 percent).

Table 2 provides a similar breakdown for output per employed person. Again, the contri-

³ Edward F. Denison, *Accounting for United States Economic Growth, 1929–1969*, The Brookings Institution, 1974. See also *The Sources of Economic Growth in the U.S. and the Alternatives Before Us*, Committee for Economic Development, 1962, and *Why Growth Rates Differ*, The Brookings Institution, 1967, by the same author.

TABLE 2.—Source of growth of potential real output¹ per person employed, 1929–69

Item	Percentage points in growth rate	Percent of growth rate
Increase in output per employed person.....	1 95	100 0
Increase in input per employed person.....	40	20 5
Labor, adjusted for quality change.....	23	11 8
Change in hours of work.....	- 22	-11 3
Education.....	41	21 0
Other.....	04	2 0
Capital.....	22	11 3
Land.....	- 05	-2 6
Increase in output per unit of input.....	1 55	79 5
Advances in knowledge.....	90	46 2
Economics of scale.....	35	17 9
Improved resource allocation.....	29	14 9
Other.....	01	5

¹ Output is measured by national income. Potential output adjusts actual output for demand-related factors.
Source: E. F. Denison, *Accounting for U.S. Economic Growth, 1929-1969*, The Brookings Institution, 1974, table 9-7, page 136, and table 9-8, page 137.

tribution of capital input is less important than the increase in output per unit of input.

The interpretation of these results is not unambiguous. Some economists argue that technological change must be “embodied” in real capital goods. Human capital theorists also argue that technological change is embodied, but in human

capital. Despite these controversies, it is clear that we must consider the growth of skills and knowledge as well as the accumulation of physical capital in explaining the growth of output.

The relationship between saving ratios and growth rates is tenuous.

The discussion thus far may lead to the inference that the rate at which an economy grows depends upon its saving ratio—the proportion of current income that the economy is able to save and invest. A recent editorial in the *Wall Street Journal*⁴ for example, suggests a strong relationship between productivity growth and the ratio of investment to total output.

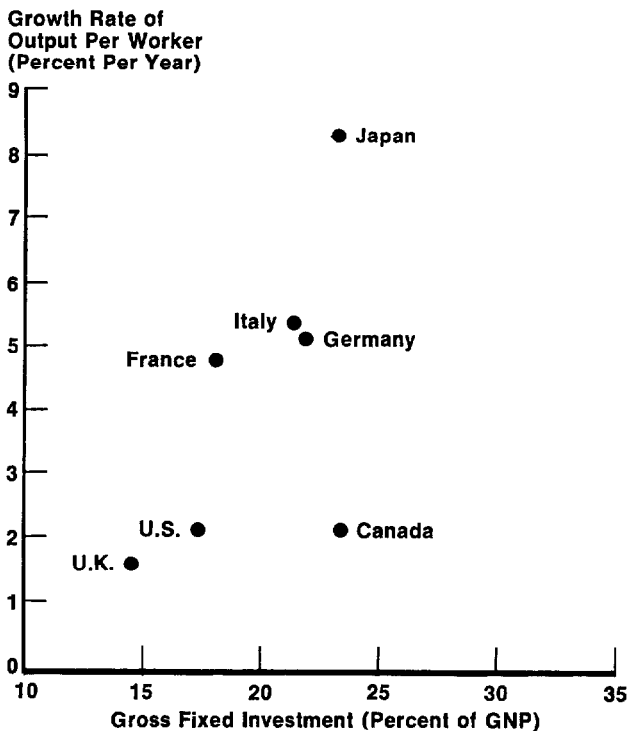
Panel A, chart 3, shows this relationship for seven major countries for the period 1950–62.⁵

⁴ *Wall Street Journal*, February 20, 1975.

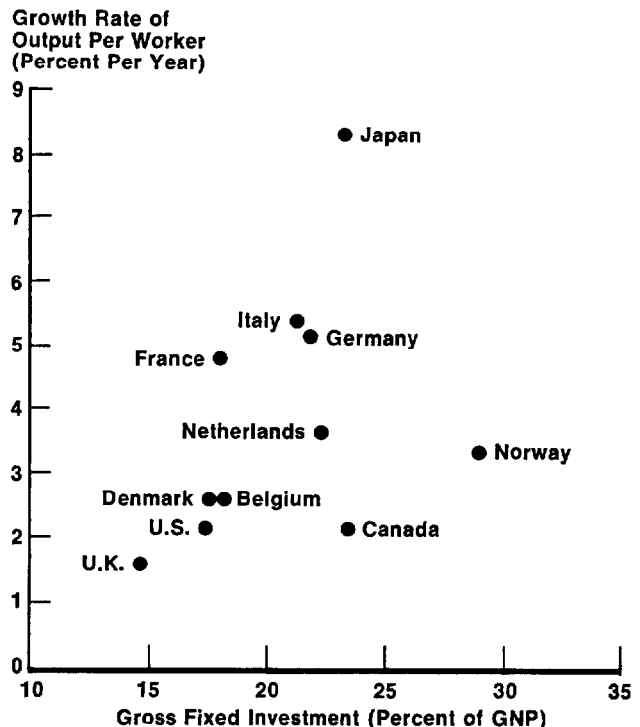
⁵ Data for all countries except Canada and Japan are from Edward F. Denison, *Why Growth Rates Differ*, The Brookings Institution, 1967. Data for Canada and Japan are from *Long Term Economic Growth, 1860-1970*, Bureau of Economic Analysis, 1973.

CHART 3.—Growth of real output per worker and percent of gross national product invested

Panel A

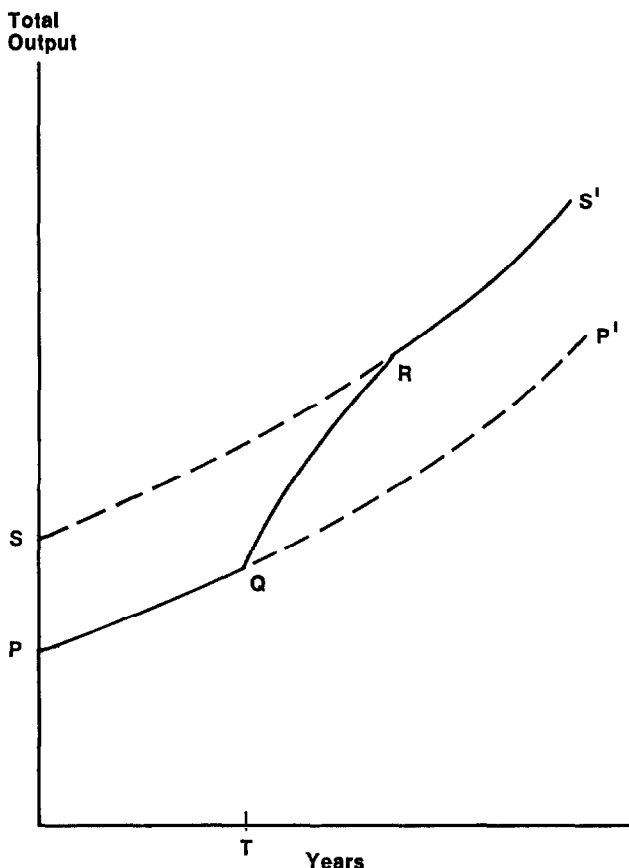


Panel B



Source: E. F. Denison, *Why Growth Rates Differ*, and Bureau of Economic Analysis, *Long Term Economic Growth, 1860-1970*.

CHART 4.—Effect of increase in saving ratio on growth path



There does appear to be a positive correlation between the growth of output per worker and the ratio of investment to output. In panel B a larger set of developed countries is considered. The relationship is now more diffuse.^{6,7}

At first thought this result may be surprising. Previous sections have emphasized the point that the growth of output is related to the proportion of resources devoted to capital formation. The observed weak relationship is not, however, inconsistent with our analysis.

First, factors other than capital formation are important in determining the rate of growth of output. As noted in the Denison study, advances in knowledge, increases in education, and other

⁶ For the seven countries, the correlation coefficient is .58; for all 11 countries it is .36.

⁷ In principle, the relevant growth rate is growth of total output; however, most comparisons use output per worker. A scatter diagram of growth of total output against the investment ratio shows the same patterns as those in chart 3. The correlation coefficient falls from .74 for the seven countries to .38 for all 11 countries.

factors are as important as the increase in capital in explaining growth of output for the United States. Similar results hold for other countries.⁸ Second, in comparing countries it is necessary to consider differences in natural resource endowments, legal and political institutions, attitudes toward work and income, etc.⁹ Third, it can be shown that in the long run, the growth rate is independent of the proportion of output devoted to capital formation.

Long-run growth rates are independent of saving ratios.

The expected relationship—that growth rates depend upon the saving ratio—assumes that capital-output ratios remain constant. As capital accumulation proceeds, however, output grows but not as rapidly as capital (other things being equal), and capital-output ratios tend to increase. This rise in capital output ratios slows down the rate of growth.¹⁰

It is true that an increase in the proportion of output devoted to investment raises the growth rate initially. As capital accumulation proceeds, however, the increase in the saving ratio raises the growth path but not the growth rate.

This is depicted in chart 4. Suppose that output is growing on the path PP'. In year T, there is an increase in saving (decrease in consumption). Output begins to grow along QR but gradually approaches the path SS'. In the long run, growth rates are independent of the saving ratio.

Growth generates saving.

One of the puzzles that has fascinated economists is the secular constancy of the ratio of aggregate saving to disposable income. As shown in chart 5, this ratio has fluctuated around an average value of approximately .08 since 1900. This contradicts earlier speculations that the saving ratio would increase as income grew.

⁸ See Edward F. Denison, *Why Growth Rates Differ*, The Brookings Institution, 1967.

⁹ In making cross-country comparisons, there are also differences in definitions, quality of data, periods covered, etc. It is doubtful that such differences are large enough to change our basic conclusion.

¹⁰ The growth rate of total output may be shown to equal the saving ratio multiplied by the ratio of output to capital (the reciprocal of the capital-output ratio). Assume, for example, that the saving ratio is 0.1. If the capital-output ratio is 3 (the output-capital ratio is .33), the growth rate is .033—i.e., 3.3 percent per year.

CHART 5.—Personal saving as percent of disposable income



There have been several explanations of this constancy. One of the most ingenious has been provided by Franco Modigliani of the Massachusetts Institute of Technology.¹¹ This explanation is based on the life-cycle hypothesis of consumption, to be used later in the discussion of the impact of social security on saving.

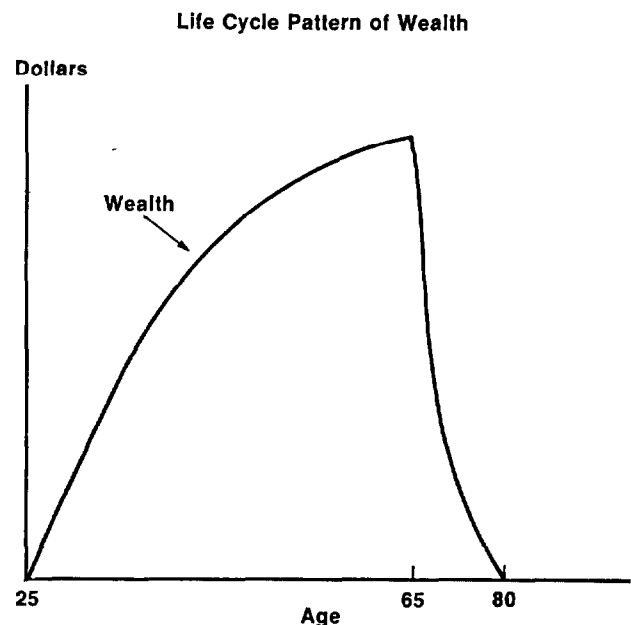
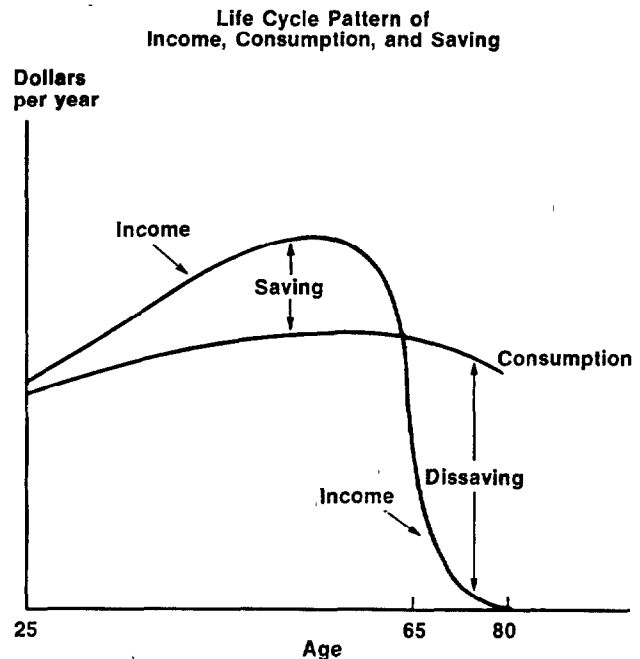
In its strictest version, the life-cycle hypothesis states that individuals save only to smooth out the stream of lifetime consumption. During their working lives, individuals save, increasing their wealth (savings deposits, securities, pension claims, etc.). After retirement, they dissave, drawing down wealth to maintain planned consumption. No estate is accumulated, nor is there saving for emergencies or other purposes. The resulting pattern of income, consumption, saving, and wealth accumulation is shown in chart 6. It is assumed that the individual enters the labor force at age 25, retires at age 65, and dies at age 80.

Suppose that population is stationary and that productivity is constant. With a stable age distribution of population, the saving of workers

will be exactly offset by dissaving of retirees. In the aggregate, saving will be zero.

If population is growing at a steady rate, there will also be a stable age distribution. In this case, the ratio of workers to retired persons will be higher than in the case of a stationary population.

CHART 6.—Life cycle patterns of income, consumption, and saving and of wealth



¹¹ See Franco Modigliani, "The Life Cycle Hypothesis of Saving, the Demand for Wealth and the Supply of Capital," *Social Research*, No. 2, 1966.

Saving by workers will exceed dissaving by retirees. In the aggregate, saving will be positive and a constant ratio of aggregate income.¹² The saving ratio will depend upon the rate of economic growth.

SOCIAL SECURITY, SAVING, AND CAPITAL FORMATION

The discussion now turns to the relationship of social security to saving and capital formation. Three general questions are considered. First, what is the impact of social security on saving? Second, assuming that social security reduces saving, is it desirable to increase saving? Third, if it is desirable to increase saving what alternative policies can be considered?

What is the impact of social security on saving?

If the social security program were simply a "pay-as-you-go" tax-transfer system in which current workers did not consider anticipated benefits in making saving decisions, the analysis would be relatively simple.¹³ The reduction in disposable income resulting from the payment of payroll taxes would lead workers to reduce both consumption and saving. The increase in disposable income resulting from benefits would lead the retired to increase consumption and saving.

The effect on aggregate saving would depend upon the level of benefits (assumed equal to taxes) and the difference between the marginal propensities to consume¹⁴ of workers and beneficiaries. For example, in 1973, old-age and survivors insurance (OASI) benefits were approximately \$46 billion. Assume that workers' propensity to consume is .9 while that of beneficiaries is 1.0. Then the reduction of saving would be \$4.6 billion, equal to the reduction in saving by workers.

¹² A similar result is obtained if productivity is growing at a constant rate.

¹³ Studies of the effect of social security on saving generally restrict consideration to retirement benefits. The analysis here is also limited to retirement benefits.

¹⁴ The marginal propensity to consume measures the proportion of additional income that is spent for consumption.

Workers anticipate future benefits in their saving decisions.

The problem is not that simple. Workers undoubtedly do anticipate future benefits to some extent in making their spending-saving decisions. In the life-cycle model described earlier, if perfect foresight and *quid pro quo* are assumed, personal saving would be reduced during work-life and dissaving correspondingly reduced during retirement.¹⁵ That is, the worker would view social security contributions as compulsory public saving and therefore a substitute for private saving. With current financing, payroll tax revenues are used to finance benefits and are not accumulated in a fund. Therefore, aggregate private saving would be reduced.

What is the empirical evidence?

Some empirical evidence suggests that social security increases saving.

As noted above, there has been no discernible downward trend in the percentage of income saved since the introduction of the social security program. Moreover, indirect evidence provided by two studies of the relationship between private pension coverage and saving behavior suggests that social security might have increased personal saving.

A 1965 study by Phillip Cagan of Columbia University analyzed the saving behavior for 1958-59 of more than 15,000 *Consumer Reports* subscribers.¹⁶ Cagan found that individuals covered by pension plans saved more than those not covered.¹⁷ He attributed his results to a "recognition effect": participation in a pension plan calls attention to retirement needs and leads individuals to increase provision for retirement.

¹⁵ Recall, however, that for a stationary economy the life-cycle model would imply zero aggregate saving even without a social security system. The reduction in saving implied by the life-cycle hypothesis assumes that the economy is growing.

¹⁶ Phillip Cagan, *The Effect of Pension Plans on Aggregate Saving*, National Bureau of Economic Research, 1965.

¹⁷ Cagan's results have been criticized by Alicia Munnell. See Alicia Munnell, *The Effect of Social Security on Personal Saving*, Ballinger, 1974 (study based on Ms Munnell's dissertation completed at Harvard University and financed by a Social Security Administration grant). A summary of the study appears in the *Social Security Bulletin*, November 1974, pages 29-30.

A second 1965 study, by George Katona of the University of Michigan's Survey Research Center, was based on personal interviews with approximately 2,000 families in 1962-63.¹⁸ Like Cagan, Katona found that pension plans increase personal saving. Katona's explanation was in terms of "goal feasibility" and "level of aspirations"—that pension plans made retirement goals feasible and that workers both raised their retirement income goals and intensified their saving effort.

The explanations offered by these studies imply that the individual's preference for future vs. present income is changed by participation in a pension plan. That is, as a result of participating in a pension plan, workers reduce consumption (and correspondingly increase saving) during their working years in order to finance increased consumption during retirement. These conclusions have generally been extended to social security.

Recent studies suggest that the social security program reduces saving.

Martin Feldstein of Harvard University has offered an alternative explanation of the empirical evidence consistent with the predictions of the life-cycle model.¹⁹ Feldstein hypothesizes that the social security program has lowered the age of retirement. With a shortened period of earnings and longer retirement period, the worker would have to increase his saving rate. This would offset the reduction in saving resulting from the substitution of anticipated retirement benefits for personal saving. The net effect on personal saving would depend upon the relative strength of these offsetting forces.

An example may clarify his hypothesis. Assume that a worker enters the labor force at age 25, earns \$10,000 per year, plans to retire at age 70, and expects to die at age 80. Suppose that he allocates his lifetime resources to provide a retirement income of \$5,000 per year and plans to leave no estate. If the interest rate is 5 percent, he would have to save \$242 per year—2.42 percent of his earnings—during his working life.

Suppose now that he is promised a retirement

benefit of \$2,500 per year. With no change in preferences, he would reduce his saving by half, saving \$121, or 1.21 percent of his income, per year. Suppose, however, that he is required or induced to retire earlier, say at age 65. Then, to maintain the same retirement income, he would have to save \$215 per year, or 2.15 percent of his earnings.²⁰ Thus, the increase in saving resulting from a shorter work-life tends to offset the reduction in saving resulting from substitution of the anticipated benefit for private saving.

The model used by Feldstein to estimate the effect of social security on saving is an aggregate consumption function based on the life-cycle hypothesis. Consumer expenditures are assumed to depend upon permanent income²¹ and wealth. Wealth is divided into two components—household assets and estimated social security wealth. Social security wealth is constructed by assuming the growth path of benefits and discounting to the present, taking survival probabilities into account. In 1971, Feldstein's estimate of social security wealth was \$2,029 billion, 60 percent of other household assets.

The Feldstein study estimates the relationship using aggregate U.S. data for the period 1929-71. The results may be approximated by the following equation:

$$C = .650 YDP + .014 HW + .021 SSW$$

where C is consumer expenditures, YDP is permanent disposable income, HW is household wealth, and SSW is estimated social security wealth.²² The interpretation of these results is that if, for example, social security wealth increases by \$100 billion, consumer expenditures will increase by \$2.1 billion per year (or, alternatively, personal saving will decrease by \$2.1 billion).

From these results, Feldstein infers that social security has substantially reduced saving, capital

¹⁸ The example abstracts from changes in the preferred life-cycle distribution of consumption and assumes that the worker still will seek to maintain retirement income of 50 percent of earnings.

¹⁹ Permanent income is an estimate of expected average lifetime income.

²⁰ The equation actually estimated was $C = .228 + .530 YD + .120 YD_{-1} + .356 RE + .014 HW + .021 SSW$ where YD_{-1} is lagged disposable income and RE is corporate retained earnings. The latter is a proxy for the permanent component of capital gains. The method of estimation used was ordinary least squares. The regression coefficients pass standard statistical significance tests.

¹⁸ George Katona, *Private Pensions and Individual Saving*, University of Michigan, Survey Research Center, 1965

¹⁹ Martin Feldstein, "Social Security, Induced Retirement, and Aggregate Capital Accumulation," *Journal of Political Economy*, September-October 1974.

formation, and output. He estimates that aggregate personal saving has been halved by social security and that total private saving has been reduced by 38 percent. In the long run, the private capital stock would also decrease by 38 percent, reflecting the decline in the rate of private saving.

This reduction in private capital formation implies a substantial reduction in GNP. Feldstein estimates that GNP would be 15 percent higher in the absence of social security.

Feldstein's results must be validated.

Feldstein's work has raised important issues; however, his results must be viewed with caution. A few points deserve particular attention.

First, the values and statistical reliability of key regression coefficients of his estimated relationship are sensitive to both the specification of the model and the period of estimation. One must be cautious in basing estimates of the reduction in saving on regression coefficients whose value and reliability is suspect.

Second, the social security wealth variable may be a proxy for changes that have occurred during the period since the introduction of social security. Unemployment compensation, private pensions, health insurance, and other income security programs have been greatly expanded. There has been an increase in the ratio of the dependent population—young and old—to the working population. Expenditures for education have increased substantially. (Such expenditures are included in consumer expenditures; in the broad sense, however, they represent capital formation.) It is likely that these changes have influenced saving behavior.

Third, the construction of the key variable, social security wealth, depends upon a particular set of assumptions about how workers perceive the present value of future benefits. Alternative assumptions would yield different wealth series and may well lead to different conclusions.

Professor Feldstein has raised an important issue. His estimates of the impact of social security on saving may be correct, although the authors suspect that they are high. Further research is necessary to test the validity of his conclusions and to refine the estimates of the magnitude of the effect on saving.

Is there too little saving?

Suppose that we accept the hypothesis that social security reduces saving. Is this necessarily bad?

The rate of growth depends on society's choice.

As noted earlier, a higher rate of capital formation is achieved at the sacrifice of present consumption. Thus, the desirability of growth turns on the desirability of sacrificing present consumption for the benefit of future generations.

Arguments can be made for such sacrifice. Since our consumption derives from the capital endowment of past generations, there is equity in making similar sacrifices on behalf of future generations. Some of us will live to enjoy this increased future consumption. On the other hand, since it is likely that succeeding generations will be richer than we are, is it necessary to make additional sacrifices on their behalf? The difficult question is how do we weigh the claims of the future against the claims of the present.

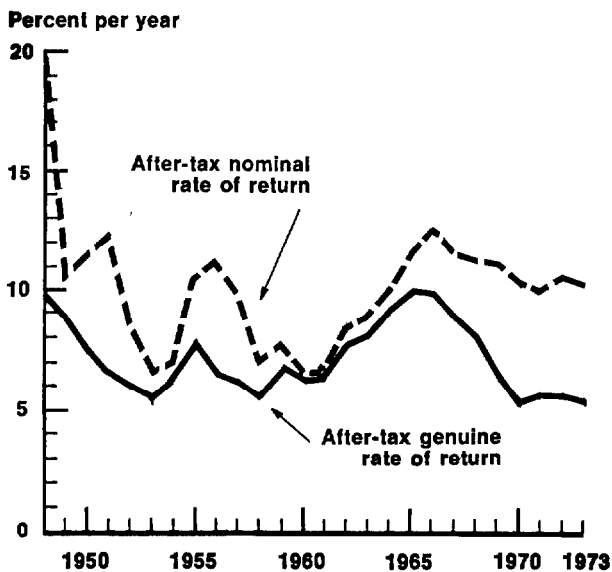
There is a related problem. If we decide that current consumption should be reduced to increase capital formation, the question arises: whose consumption should be reduced? In the context of the social security system, for example, the alternatives might be to reduce the consumption of workers or the consumption of beneficiaries.

The existence of such alternatives may give rise to conflicting goals. If workers are unwilling to sacrifice present consumption for the benefit of the future, then the burden must fall on the retired. If we are committed to supporting the aged, this solution is unsatisfactory. We may prefer to accept a lower growth path in order to maintain transfers to the aged. Thus, even if we accept the conclusion that capital formation and potential output have been reduced by social security, we may agree that this growth path is preferred.

Is there a shortage of capital?

Concern about the impact of social security on saving is associated with the belief that there is a shortage of capital. Several recent studies have projected a chronic shortage of investment funds over the next decade and concluded that a large increase in saving is required.

CHART 7.—Genuine and nominal after-tax rates of return on nonfinancial corporate capital, 1948–73



Source: William D. Nordhaus, *The Falling Share of Profits* (Brookings Papers on Economic Activity, No. 1), The Brookings Institution, 1974.

In a recent *Newsweek* column,²³ Paul Samuelson of the Massachusetts Institute of Technology disputes the capital shortage thesis. If we mean by "shortage" that investment demand is increasing relative to the supply of saving, then the yield on capital before and after taxes should be rising. A recent study by William Nordhaus of Yale University finds, however, that real yields have been falling in recent years.²⁴ Nordhaus finds that after correction for inflation gains, the after-tax rate of return has fallen from above 8 percent in the mid-1960's to 5–6 percent in the 1970's (chart 7).

A recent Joint Economic Committee Report provides a balanced review of the issue and concludes that there are no present grounds for alarm about long-term projections of a capital shortage.²⁵

²³ *Newsweek*, August 26, 1974.

²⁴ William Nordhaus, "The Falling Share of Profits," *Brookings Papers on Economic Activity*, No. 1, 1974.

²⁵ *Achieving Price Stability Through Economic Growth*, Report of the Joint Economic Committee, U.S. Congress, December 30, 1974, pages 93–99.

What are the alternatives?

Suppose that we agree that social security reduces saving and that this reduction in capital formation is undesirable. The effect on saving of two alternatives—first, phasing out social security, and second, full or partial funding—will be considered.

Phasing out the system is an unrealistic alternative.

Milton Friedman of the University of Chicago has proposed phasing out the present system and replacing it with a negative income tax.²⁶ Although this alternative is unlikely, it is useful to consider its implications. In a lucid article,²⁷ Edgar Browning of the University of Virginia argues that it is always to the interest of current workers to maintain the existing system. That is, the generation of beneficiaries must be supported by current workers whether or not they receive future benefits. Thus, workers are better off if the social security system is maintained.

An income-conditioned transfer system—such as a negative income tax or supplemental security income (SSI)—would also create disincentives to save, particularly for low earners. That is, the receipt of property income resulting from saving would reduce the amount of the transfer. This effect would be even stronger if there were an asset test such as that for the SSI program.

Funding the social security system would also create problems.

Since the system's beginning, there have been some proponents of full or partial funding.²⁸ Is such funding a viable solution?

Will current workers pay higher taxes to create a funded system?

The initiation of full funding at this point

²⁶ See, for example, Wilbur Cohen and Milton Friedman, *Social Security: Universal or Selective?*, American Enterprise Institute for Public Policy Research, c. 1972.

²⁷ Edgar Browning, "Social Insurance and Intergenerational Transfers," *Journal of Law and Economics*, October 1973.

²⁸ Recently, Martin Feldstein has made the radical proposal of creating an "endowment fund," that is, a fund large enough to pay all benefits in perpetuity with no payroll tax. See Martin Feldstein, *The Optimal Financing of Social Security*, (Discussion Paper No. 388), Harvard Institute of Economic Research, November 1974.

in the system's history would be particularly difficult. Creating a funded system would require a tax rate larger than that required to maintain current financing. The recent Advisory Council Report states that a combined OASDI employer-employee tax of 10.9 percent will be required for 1976-79.²⁹ Thus, establishing a funded system would require a combined tax above this level. Such an increase would reduce the effective return for current workers and would undoubtedly lead to further complaints about the "burden" of the social security system.

Can government carry out the necessary policies?

An increase in social security taxes would shift the budget in the direction of a surplus, increasing total saving in the economy. However, increased saving will lead to a corresponding increase in capital formation only under conditions of full employment. To channel this saving into investment while maintaining aggregate demand at the full employment level, policy actions by the Government would be required. For example, an easing of monetary policy by the Federal Reserve could be used to lower interest rates, inducing business firms to invest in plant and equipment.

The ability of the Government to carry out the necessary policies is subject to debate. The historical evidence suggests that policies to simultaneously increase capital formation and maintain aggregate demand were not available in the early history of the social security system. It seems likely that increased fund accumulation in the pre-World War II period would have further reduced aggregate demand. Such reduction in aggregate demand during World War II would have been desirable, but it is unlikely that additional capital formation would have resulted. The evidence in the decade following World War II suggests that the role of fiscal and monetary policy in stabilizing the economy was not well understood.

Creation of a funded system within the context of the present recessionary economic environment

²⁹ *Reports of the Quadrennial Advisory Council on Social Security*, House Document No. 94-75, U.S. Government Printing Office, 1975 (Transmitted to the Congress, March 7, 1975.)

would be unproductive. An increase in payroll taxes would reduce disposable income and thus reduce consumer expenditures. This reduction in aggregate demand would lead to reduced output and higher unemployment.

The Government could pursue policies designed to offset the deflationary effect of such an increase in payroll taxes—for example, by lowering personal income taxes. Such an action would, however, also nullify the effect on aggregate saving. That is, since the increase in payroll taxes and decrease in personal incomes taxes would be approximately equal, both the Government surplus and aggregate saving in the economy would be approximately unchanged. The nominal increase in the trust fund would not lead to real capital formation.

In addition, with unemployed resources, increased saving is not essential for capital formation. It is not necessary to sacrifice consumption for investment. Policies can be pursued to increase both capital formation and consumption. For example, investment can be increased by liberalizing the investment tax credit or easing monetary policy. This would expand capital formation and output. The problem with such policies is, of course, that they might also put upward pressure on prices.³⁰

Investing the fund would be difficult.

One of the early decisions with respect to social security financing was to restrict investment of the social security trust fund to United States securities. With this restriction, creation of a sizable fund would be difficult. Total U.S. securities outstanding at the end of 1974 were \$493 billion. Thus, even if the old-age and survivors insurance trust fund held all outstanding U.S. securities, this amount would be considerably less than the estimated "unfunded liability" of the system.³¹

How are the additional securities required for a funded system to be obtained? Unless the

³⁰ It should be noted that the creation of a sizable trust fund is independent of the question of the use of the social security program for fiscal policy purposes. It is possible to change social security taxes to stabilize the economy either with current-cost financing or full-reserve financing.

³¹ Estimates of the unfunded liability range from \$1 trillion to \$2 trillion depending upon the concept and underlying assumptions.

system can purchase private securities—a solution that raises complex issues—difficult fiscal problems are created. To issue the securities that the old-age and survivors insurance trust fund would need to purchase, the Treasury would have to increase its spending or reduce other taxes. Additional spending would increase future output only if devoted to public capital formation. If other taxes were reduced, we would in effect be substituting the payroll tax for general revenues in financing Government consumption expenditures. The effect on private saving would depend upon the differential impact on saving of the payroll tax as opposed to other Federal taxes.

A large fund might hamper monetary policy.

One of the most important instruments of monetary policy consists of Federal Reserve sale and purchase of U.S. securities. Clearly, such open-market operations require that Federal Reserve banks, commercial banks, and individuals hold such securities. If the development of a funded system resulted in the social security trust funds owning all U.S. securities, open-market operations would be impossible (unless other financial instruments are used). This would severely limit the use of monetary policy for purposes of stabilization and growth.

There are alternative approaches to increasing growth

Suppose that there is a conscious Government policy objective to increase the rate of growth. This does not require that the social security system should be the instrument of such growth policy.

It has been pointed out that the use of the social security system to create additional saving requires simultaneous fiscal or monetary measures to effect an increase in investment. This suggests that such measures could be undertaken while current cost financing is maintained. A Government surplus could be created or increased by increasing personal income taxes. Private investment could be stimulated by the use of investment tax credits or accelerated depreciation. Human capital formation could be accelerated by expenditures on education, health, and research and development.

Thus, a number of alternative approaches—including funding the social security system—exist to increase economic growth. The choice of policy depends upon the effectiveness of each policy in increasing growth as well as other objectives, such as the impact on the distribution of income and wealth and the maintenance of economic stability.