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*Cyclical Indicators of Economic
Activity
Consumer Credit Trends
Income Distribution and Its
Measurement*



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Cyclical Indicators of Economic Activity: Part I

INTRODUCTION

Techniques developed for the purpose of predicting changes in economic activity date back as far as 1862 when Clement Juglar, a French statistician, observed that time series data on "prices and finance" appeared to suggest cyclical movements in business conditions. Since that time, significant progress has been made in business forecasting and prediction. Today, the important types of forecasting techniques include (1) comprehensive economic models, of varying degrees of formality, that postulate certain relationships between key variables; (2) extrapolative methods that depend upon past and current values of particular variables in determining future values; and (3) analysis of selected business cycle indicators chosen for their consistency in signaling turning points in aggregate economic activity.

This article is the first in a two-part series designed to familiarize the reader with the major uses and limitations of business cycle indicators, a group of statistical series that have proved useful to analysts of cyclical or cycle-like swings in business. Analysts generally group these indicators into three classes: (1) the so-called leading indicators, which move in advance of changes in the direction of general business activity; (2) the coincident indicators, which move coincidentally with general business; and (3) the lagging indicators, which usually change direction after general business has turned around. The first article concentrates on the leading indicators. A subsequent article will discuss coincident and lagging indicators, along with the so-called diffusion indexes that are useful in confirming cyclical turns in economic conditions.

The first group of widely-known economic indicators was published in 1919 by the Harvard University Committee on Economic Research under the direction of Warren M. Persons. The Harvard Index Chart consisted of three basic categories of activity: (A) speculation (stock prices); (B) business (wholesale prices, later bank debits); and (C) money market (short-term interest rates). The A-B-C sequence, as it was commonly called, has been developed because of its outstanding conformity to business conditions prior to World War I. Although the index performed well in the 1920's, its failure to anticipate the Great Depression led to its demise in the thirties. Its major contribution was

the development of techniques used in the selection of modern business indicators.

The identification of particular statistical series that are especially useful in studying business fluctuations has been largely the work of the National Bureau of Economic Research (NBER). Selection is based on economic significance, statistical adequacy, historical conformity to general business fluctuations, smoothness, currency of publication, and cyclical timing. Some of the indicators are classified according to timing. Generally speaking, these are of greatest immediate interest to business analysts, although all the selected series can be useful in explaining business fluctuations. Other indicators that play an important role in the explanation of cyclical movements are also selected, but these are not generally as reliable as those classified by timing.

The business cycle indicators used by today's analysts are an outgrowth of the work of the NBER. Since its inception in 1920, this organization has made extensive studies of massive amounts of statistical data bearing on business activity. Over 500 series were investigated before its first list of indicators was published in 1938. The initial list consisted of twenty-one indicators of cyclical recovery. Major reviews and updates of the series were conducted in 1950, 1960, and 1966.

At the present time, the NBER classifies and reports seventy-three individual economic series by timing and economic process. These series are reported monthly in *Business Conditions Digest* (*BCD*)—formerly called *Business Cycle Developments*—a publication of the U. S. Department of Commerce. Selection of the cyclical indicators reported in *BCD* is the responsibility of the NBER, although the Department of Commerce includes several additional measures of economic activity.

Of the seventy-three indicators currently reported by *BCD*, thirty-seven are leaders, twenty-five are coinciders, and eleven are laggards. They are cross-classified into six economic processes as shown in Table I.

LEADING INDICATORS

Leading indicators are those indicators that, in the past, have generally led changes in aggregate business conditions. They are used mainly to decrease the recognition lag of cyclical turning points. Because the leads vary considerably in length and changes in individual series are often erratic, their

use in the determination of significant turning points in the general economy usually requires the exercise of considerable caution. Successive increases or declines in leading indicators have occasionally occurred in the past without subsequent turning points in aggregate business conditions.

Generally speaking, leading indicators include "flow" series as opposed to "stock" series since flows change direction before their corresponding stocks. For example, investment in plant and equipment at a rate greater than capital depreciation adds to the stock of capital. Hence, the stock of capital can continue to grow even though the current flow of investment expenditure may be declining. Other typical examples of leading indicators include building permits or contracts that precede actual construction, and job vacancies that precede changes in employment.

In addition to their value in anticipating future turning points, study of the leading indicators has helped to develop and explain links between different types of economic activity. Reasonably consistent patterns have developed between many of the leaders and the coincident and lagging indicators that follow. Although the selection is based primarily on historical timing, economic logic also plays a significant role in the selection process.

NBER Short List and Composite Index The NBER specifies a short list of twelve indicators from its complete list of leading indicators. They purport to provide a current view of substantially unduplicated economic processes that have been reasonably consistent in leading previous cyclical turning points. Eleven of the series are reported monthly by the source agency; the twelfth—corporate profits after taxes—is reported quarterly.

A convenient summary measure of the twelve leaders is computed monthly and reported as a composite index. In computing the composite index, each series is standardized so that all have an equal opportunity to influence the total index. Then, each of the twelve indicators is weighted according to its score (past performance) as an economic indicator.¹

The composite index of twelve leading indicators has been criticized by forecasters on several grounds. One of the major weaknesses lies in the extreme variability of its leads for business peaks and its extremely short leads at business troughs. Lead times of the composite index were 6, 22, 13, and 7 months at the 1953, 1957, 1960, and 1969 peaks.

¹ For a more detailed description of the construction of composite indexes, see *Business Conditions Digest* (September 1969), p. 104. For discussion of the scoring system, see Geoffrey H. Moore and Julius Shiskin, *Indicators of Business Expansions and Contractions* (New York: NBER, 1967).

Table I

CROSS-CLASSIFICATION OF CYCLICAL INDICATORS BY ECONOMIC PROCESS AND CYCLICAL TIMING

<div> <div>Economic Process</div> <div>Cyclical Timing</div> </div>	I. EMPLOYMENT AND UNEMPLOYMENT (15 series)	II. PRODUCTION, INCOME, CONSUMPTION, AND TRADE (8 series)	III. FIXED CAPITAL INVESTMENT (14 series)	IV. INVENTORIES AND INVENTORY INVESTMENT (9 series)	V. PRICES, COSTS, AND PROFITS (10 series)	VI. MONEY AND CREDIT (17 series)
LEADING INDICATORS (37 series)	Marginal employment adjustments (6 series)		Formation of business enterprises (2 series) New investment commitments (8 series)	Inventory investment and purchasing (7 series)	Sensitive commodity prices (1 series) Stock prices (1 series) Profits and profit margins (4 series)	Flows of money and credit (6 series) Credit difficulties (2 series)
ROUGHLY COINCIDENT INDICATORS (25 series)	Job vacancies (2 series) Comprehensive employment (3 series) Comprehensive unemployment (3 series)	Comprehensive production (3 series) Comprehensive income (2 series) Comprehensive consumption and trade (3 series)	Backlog of investment commitments (2 series)		Comprehensive wholesale prices (2 series)	Bank reserves (1 series) Money market interest rates (4 series)
LAGGING INDICATORS (11 series)	Long-duration unemployment (1 series)		Investment expenditures (2 series)	Inventories (2 series)	Unit labor costs (2 series)	Outstanding debt (2 series) Interest rates on business loans and mortgages (2 series)

Source: U. S. Department of Commerce, *Business Conditions Digest*, June 1971.

Lead times were 5, 0, 2, and 0 months respectively for the 1954, 1958, 1961, and 1970 cyclical troughs. Although the leads are highly variable, generally speaking they have been too long in expansionary periods to be helpful in signaling a need for policy change to prevent an oncoming recession. Furthermore, contractions have frequently come to an end and recovery has begun before a change in direction of the leading indicators is confirmed.

Adjustments in the Composite Because most of the components in the composite index are flows or changes in stock components that exhibit no secular trend, the composite index itself exhibits no secular upward trend. On the other hand, the components of the composite coincident index are primarily production and employment series that follow a secular trend similar to that of aggregate economic output.

To facilitate comparison of the leading composite with the coincident and lagging composites, the leading index has been adjusted. The adjustment technique was developed under the direction of Julius Shiskin, Chief Economic Statistician at the Bureau of the Census. In brief, the technique involves removing whatever trend exists in the leading composite and adding the trend exhibited by the coincident composite to the leading index. The statistical method is called "reverse trend adjustment" since a trend is added to the series rather than removed from the series in the usual statistical sense.²

Reverse trend adjustment of the composite index has also reduced the lead variability at cyclical peaks and troughs and has diminished the likelihood of false signals of recessions. Trend adjustment decreases lead times in expansions and increases lead times around troughs. It also moderates false signals of recessions that occur in periods of sustained expansion. In summarizing the advantages and limitations of reverse-trend adjustment, Shiskin states: "Reverse-trend adjustment promises to be another advance in the development of . . . techniques [that make statistical data serve practical ends]. No one should expect it to make the leading indicators error-proof forecasting tools, nor to eliminate the difficulties of interpreting current changes."³

Preliminary and Revised Composite Index A preliminary monthly report of the composite leading indicators is issued by the Commerce Department. At the time of release, only eight of the twelve individual series are usually available. Three of the four missing components are re-

ported on a monthly basis at a later date. As these figures become available, the composite index is revised to show the influence of these factors. The fourth component, corporate profits after taxes, is available on a quarterly basis only. This figure is linearly interpolated into a monthly series when it is reported by the source agency, and the composite index is again revised. Additional revisions are sometimes made as a result of changes in seasonal adjustment factors or when other more complete information is furnished by the source agency of the component series.

Initial reports for the composite index are issued with approximately a one month lag. The largest revisions for a given monthly index usually occur in the next one to two months. As a result, lead times should be at least two months, preferably longer, to be useful in anticipating turning points.

Performance Record Performance of the leading indicators has been measured by several different tests. The most common criteria include determination of average lead times and variability of lead times. Other common criteria are: the percentage of times an indicator or group of indicators within the composite group actually led the cycle, the percentage of times a series or group turned at a business cycle turning point, and the percentage of times a series or group turned without a turn in general business conditions.

Individual leading indicators, as a rule, are not as reliable for purposes of prediction as the composite group of indicators. Single components often have lead times that vary considerably from one cycle, or a phase of a cycle, to another. The index for the group as a whole is generally much smoother since erratic swings in individual components often offset one another.

As a result, the primary usefulness in analyzing individual components is to determine sectors of the economy that are likely to weaken in the near future. For example, a decline in contracts and orders for plant and equipment for several months will lead a decline in business expenditures for plant and equipment. Careful study of the components may also be helpful in determining other less obvious links between different types of economic activity, as suggested earlier in this article.

The performance of thirty leading indicators has been studied by Michael K. Evans over the post-War period through 1965.⁴ His requirements were

² Julius Shiskin, "Reverse Trend Adjustment of Leading Indicators," *The Review of Economics and Statistics*, 49, No. 1 (February 1967), 45-49.

³ *Ibid.*, p. 49.

⁴ Michael K. Evans, *Macroeconomic Activity: Theory, Forecasting, and Control* (New York: Harper & Row, Publishers, Inc., 1969), pp. 455-60.

rather restrictive in that he considered all series with mean leads of less than four months of little value in anticipating turning points. This procedure eliminated six series at the peaks and twenty-four series at the troughs. He also eliminated series with highly variable lead times by deleting those series with high variability compared to the average (mean) lead over the previous peaks and troughs. For example, a series that led one downturn by twenty months and another downturn by two months would have been eliminated by Evans since the variation in lead times from cycle to cycle was so large compared with the average lead for that series. High variance in lead times eliminated nineteen of the remaining twenty-four series at peaks and three of the six series remaining at troughs. Of those passing both tests, only two were efficient in predicting both peaks and troughs.

Evans' procedure illustrates one of the major reasons why the forecaster should be wary of using in-

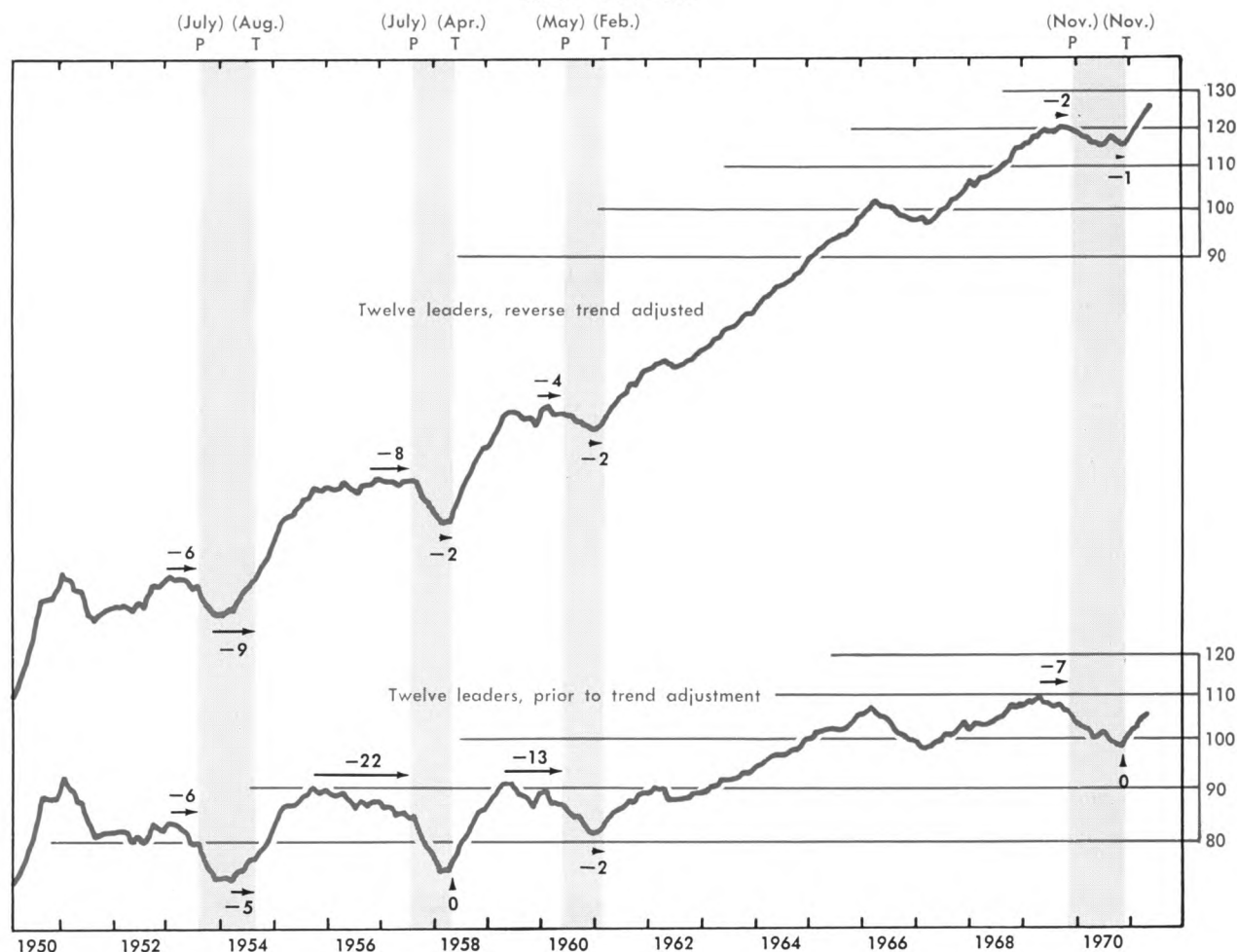
dividual series in predicting future economic conditions. Many analysts have cautioned against the use of individual time series for the purpose of anticipating turning points. As mentioned earlier, the primary research value in studying separate components is to discover and analyze links between different types of economic processes.

Evans continued his study of the thirty leading indicators with an investigation of false signals. In his sample of four false downturns (1952, 1956, 1959, and 1962), he found that only four of the thirty leading indicators in his sample gave no false signals; three others had relatively small declines compared to their average declines in actual recessions. Fifteen of the indicators signaled one or less false turns.

Adding the 1967 false downturn to Evans' results changes them very little. Three showed no appreciable turn, and eight other indicators declined

Chart 1
COMPOSITE INDEX OF TWELVE LEADING INDICATORS

Index: 1967 = 100



Source: U. S. Department of Commerce, *Business Conditions Digest*, June 1971.

less than their average decline in actual recessions. (Two are no longer reported in *BCD*.)

Since components of the NBER short list of twelve leading indicators were selected because of their better-than-average performance record and economic significance in previous cyclical periods, the short list has been more reliable than Evans' list of thirty indicators. The performance record of the twelve leading indicators is summarized in Table II.

Average lead times at peaks varied between sixteen months for new housing permits to six months for both plant and equipment contracts and orders and change in value of inventory for manufacturing and trade establishments. Average lead times at troughs were considerably shorter. Again, new housing permits exhibited the longest lead time with an average of seven months. The ratio of price to unit labor cost in manufacturing was the only leading indicator in the group that failed to show a positive mean lead time over the five post-War recessions.

False signals were registered by eight of the twelve indicators in non-recessionary downturns. One indicator exhibited four false signals, and two others exhibited three false signals.

The only indicator that failed to signal a recession was contracts and orders for plant and equipment. The indicator fluctuated around a flat trend line prior to the 1960-1961 recession but failed to show any appreciable decline prior to the turning point.

The composite index of twelve leading indicators had a mean lead time of five months around peaks and a mean lead time of four months around troughs. It did not fail to signal any of the post-War recessions, but it did falsely signal a recession in 1952 and 1967.

The 1952 and 1967 downturns in business activity were the weakest non-recessionary periods in the post-War era. Indeed, declines in real GNP were recorded in two quarters in the 1951-1952 slowdown and in one quarter in 1967. Of the non-recessionary slowdowns since the War, only the 1962 period failed to experience at least one quarterly decline in real GNP. Real growth did, however, fall to an annual rate of 2.2 percent by the end of 1962. Hence, it is clear that the false signals given by the leading indicators in the non-recessionary post-War periods did in fact signal slowdowns in economic activity, even though these slowdowns were not severe enough to be classified as recessions.

Summary The major contribution of the leading indicators is to help forecasters and policymakers to recognize turning points in general economic conditions before they actually occur. Their record of performance suggests that they have been reasonably reliable in anticipating downturns. One of the obvious weaknesses of the indicators, however, has been their inability to determine the magnitude of expected slowdowns. The percentage decline in the leading indicators is not highly correlated with the severity of subsequent declines in economic activity.

Inconsistent lead times also pose a problem to users of leading indicators. Lead times at peaks are usually longer than lead times at troughs, and specific indicators are not consistent from peak to peak and trough to trough. There is little doubt, however, that the leading indicators are useful—where model builders have had little success—in determining the timing of prospective changes in economic activity.

Clyde H. Farnsworth, Jr.

Table II

PERFORMANCE RECORD OF TWELVE LEADING INDICATORS, 1945-1971

Series Name	Mean Lead Time,* Peaks (mos.)	Mean Lead Time,* Troughs (mos.)	False Signals (No.)	Failure to Signal (No.)	Average** Score (percent)
Average workweek, production workers, manufacturing	11	2	3	0	66
Average weekly initial claims, State unemployment insurance	15	1	2	0	73
New building permits, private housing units	16	7	2	0	67
Net business formation	15***	2	2	0	68
New orders, durable goods industries	7	3	2	0	78
Contracts and orders, plant and equipment	6	2	2	1	64
Change in book value, manufacturing and trade inventories	6	1	4	0	65
Industrial materials prices	12	4	2	0	67
Stock prices, 500 common stocks	9	5	2	0	81
Corporate profits after taxes	9	2	2	0	68
Ratio, price to unit labor cost, manufacturing	14	0	1	0	69
Change in consumer installment debt	13	3	3	0	63
Composite index, reverse trend adjusted	5	4	2	0	

*The 1948-49, 1953-54, 1957-58, 1960-61, 1969-70 recessions were used to determine lead times.

**Based on a range of 0 to 100%. See Geoffrey H. Moore and Julius Shiskin, *Indicators of Business Expansions and Contractions* (New York: NBER, 1967).

***Index of net business formations was not available in determining lead time prior to the 1948 peak.

Source: U. S. Department of Commerce, *Business Conditions Digest*, June 1971.

Income Distribution and Its Measurement

PART I: DISTRIBUTION AMONG THE FACTORS OF PRODUCTION

Economic analysis in recent years has focused increasingly on the question of income distribution. There are a number of reasons for this resurgence of interest in a subject which occupied much of the attention of nineteenth century economists. In the first place, public concern over the problem of poverty has stimulated efforts to determine whether the gap between the poorest stratum and the rest of an increasingly affluent society is narrowing or widening. Second, recent experience with inflation and unemployment has generated a suspicion in some quarters that these two economic evils may have resulted in a significant redistribution of purchasing power among socioeconomic groupings. Then, too, the steadily increasing emphasis on human capital in economic analysis has pointed up the connection between education and productivity on the one hand and income on the other, suggesting that wide disparities in income levels might indicate large long term losses of output for society. Finally, the increasing quantity and quality of national income data has enabled researchers to undertake empirical evaluation of long accepted but largely untested theoretical models of distributive shares.

Analysts tackling the subject generally distinguish between *size* distribution and *functional* distribution of income. *Size* distribution refers to the division of income among families and individuals classified by income brackets. *Functional* distribution denotes the division of the national income among the factors of production—land, labor, capital, and entrepreneurship—that combine to produce it.

The paragraphs that follow outline the evolution of distributive share analysis in economic thought, discuss the behavior of the functional distribution of income in the United States, and describe some of the methods and measures employed by researchers who study it. A second article, to appear in a future issue of the *Monthly Review*, will discuss the size distribution of income.

EARLY DISTRIBUTIVE SHARE ANALYSIS

Traditionally, economists have devoted more attention to the functional than to the size distribution of income. Early nineteenth century economic analysis was dominated by the view, associated largely with David Ricardo, that the study of distributive shares held the key to the understanding

of the entire economic mechanism, including the forces determining the rate and character of economic growth. To the Classical Economists of nineteenth century England, who took their cue largely from Ricardo, the distribution of income served three purposes. It divided the recipients into mutually exclusive economic groups, identified by their function in the production process; it served as an indicator of the relative welfare of the respective groups; and it defined the social classes that would play key roles in the economic evolution of the nation. Economic development was looked upon as a drama in which the actors were grouped by economic function, serving specified socioeconomic roles. For example, the working class not only supplied labor but, through procreation, insured the existence of labor supplies in perpetuity. The industrial class was associated with accumulation and the capital-supplying function, while the landed aristocracy exercised stewardship over land, a scarce and increasingly remunerative resource. On the basis of this model, British economists predicted that excessive procreation by the laboring class would combine with diminishing returns in land cultivation to bring bare minimum subsistence wages to labor, zero profits to capitalists, riches to landowners, and eventually cessation of growth for the economy as a whole.

Karl Marx, writing later in the century, also identified each factor of production with a distinct social class. Following the classical tradition, his analysis assumed that no income recipient could belong to more than one economic group, supply more than one type of productive resource, nor receive more than one type of factor income. A laborer could not simultaneously be a capitalist, nor a capitalist a laborer. In Marx's scenario, accelerating antagonism between an ever growing laboring class doomed to subsistence wages and an increasingly exclusive and wealthy capitalist class meant the eventual end of traditional capitalist socioeconomic organization, along with its political superstructure. By the time Marx systematized his model of class conflict, however, a new breed of classicists were weaving an intricate analysis demonstrating that the free market would achieve distributive justice and

(Continued on page 10)

CHARTS 1 AND 2 Consumer credit, which finances nearly 20% of the value of all consumer purchases, is comprised of short- or intermediate-term loans for automobiles, household appliances, and other personal debts. Although consumer spending is determined primarily by current and expected levels of income, changes in the volume of consumer credit, along with changes in saving, have often contributed to some short-run movements in consumption. Normally, as income rises, so does spending, saving, and the accumulation of debt. Sudden changes in income, however, often result in adjustments in saving and debt accumulation in order to maintain spending. On the other hand, during periods of uncertain economic conditions, consumers may postpone current spending and increase saving while curtailing debt accumulation. All these phenomena have occurred in recent years.

From 1965 through the first half of 1968, rapid economic expansion was accompanied by similar increases in consumer spending, saving, and credit. Following the surtax of July 1968, the expected slowdown in consumer spending did not materialize. Instead, consumers relied more heavily on consumer

credit and decreased their rate of saving in order to maintain spending levels. This pattern continued into the tight money period of 1969. The saving rate increased sharply in the third quarter of 1969 and continued to rise in 1970. Faced with uncertainty over inflation, unemployment, and political problems, consumers reduced their borrowing in relation to disposable income. During the first quarter of 1971, however, consumer spending regained some of its lost strength, despite a drop in consumer credit outstanding. Again consumers appeared to rely on a reduced saving rate to finance current spending.

CHART 3 Consumer credit is composed of installment and noninstallment credit. Noninstallment credit, the smaller of the two components, consists of single-payment loans, charge accounts, and service credit. Single-payment loans and charge accounts, although decreasing slightly during the economic

slowdown of 1969-70, have shown substantial net increases over the past three years. Service credit was singularly unaffected by the slowdown and has continued to increase steadily since 1968.

CHART 4 More than 80% of all consumer credit outstanding is extended on an installment basis, with repayment scheduled in more or less equal monthly installments running over a specified period. Automobile paper, other consumer goods paper, repair and modernization loans, and personal loans are the major components of installment credit. Automobile loans, the largest and most volatile component, make up approximately 38% of all installment credit. Automobile credit expanded rapidly throughout 1968, tapered off in 1969 and 1970, then declined during the General Motors strike in the fourth quarter of 1970. Other components of installment credit continued to expand throughout this

period; however, their small increase was not sufficient to offset the drop in automobile paper in the fourth quarter of 1970. In the first quarter of 1971 the surge in automobile sales following the strike was not accompanied by an increase in automobile paper outstanding, suggesting that many new car sales were financed from past savings rather than credit.

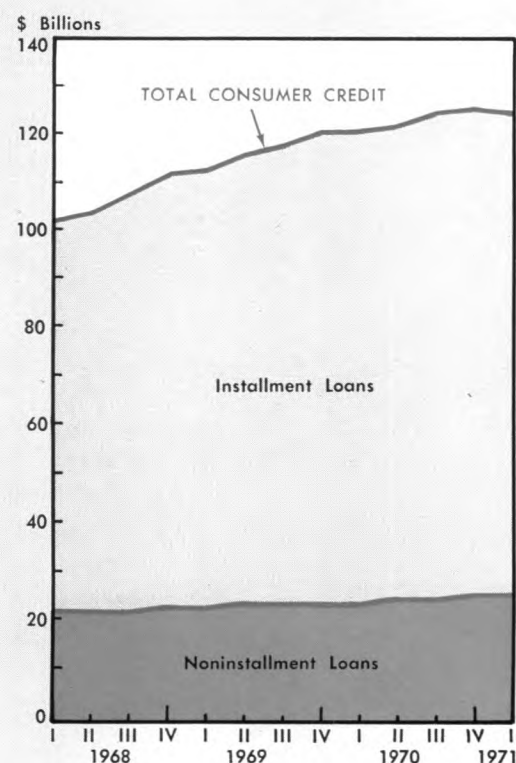
CHART 5 Installment credit extended reached a peak of 16.8% of disposable income in the second quarter of 1969 and then decreased slowly until the first quarter of 1970. The decline in this percentage was caused primarily by the decrease in automobile sales and the consumer's desire for cheaper, smaller cars.

After hitting a low point of 14.6% of disposable income in the second quarter of 1970, repayments of installment debt rose steadily through the first quarter of this year and exceeded extensions in the fourth quarter of 1970, primarily because of the work stoppage in the industry in that quarter.

Jane N. Haws

Chart 1

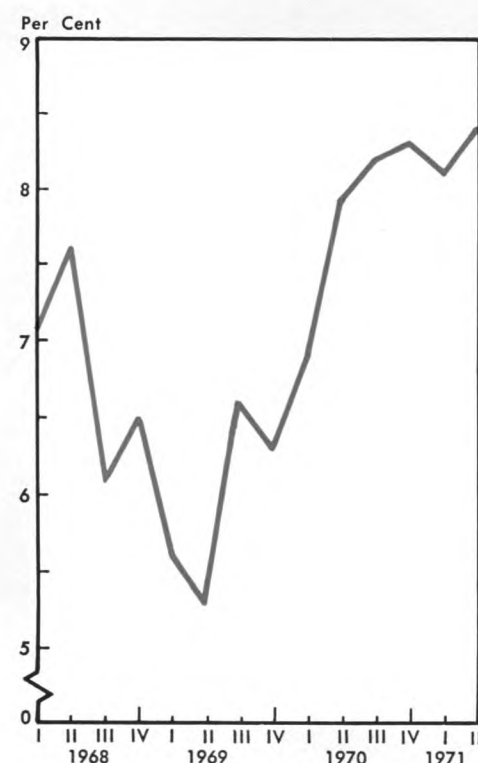
COMPONENTS OF CONSUMER CREDIT OUTSTANDING



Source: Federal Reserve Bulletin.

Chart 2

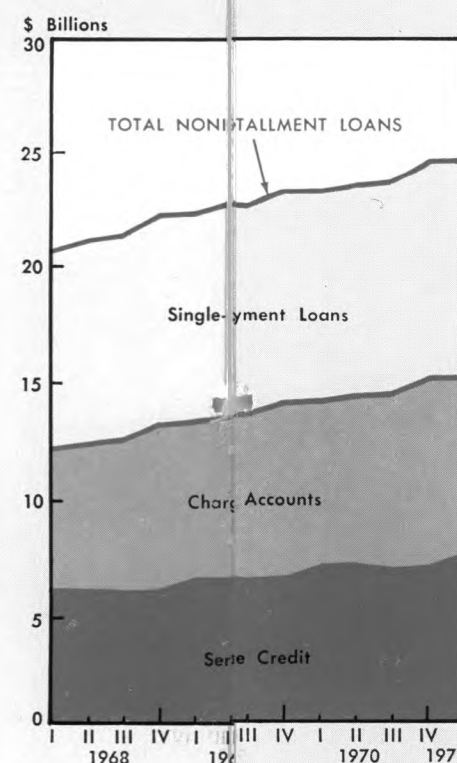
PERSONAL SAVING AS A PERCENTAGE OF DISPOSABLE PERSONAL INCOME



Source: Survey of Current Business.

Chart 3

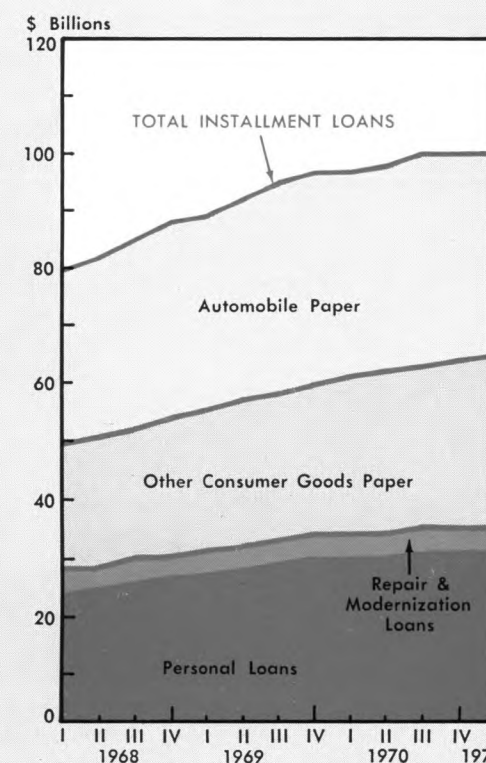
COMPONENTS OF NONINSTALLMENT LOANS OUTSTANDING



Source: Federal Reserve Bulletin.

Chart 4

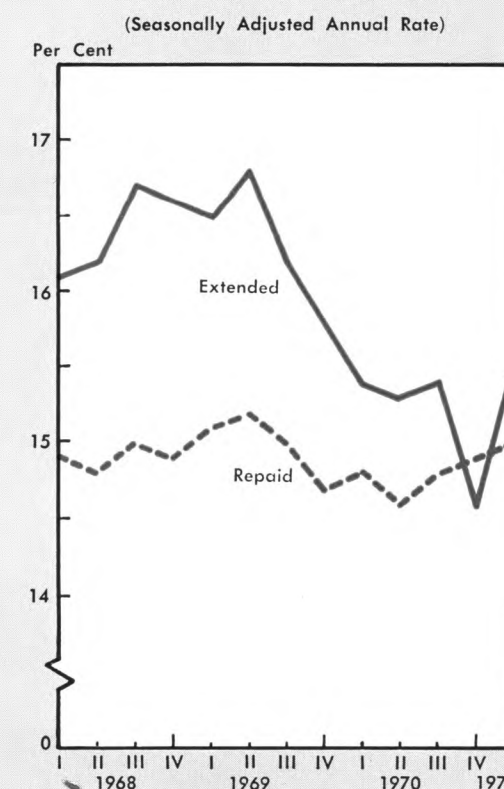
COMPONENTS OF INSTALLMENT LOANS OUTSTANDING



Source: Federal Reserve Bulletin.

Chart 5

INSTALLMENT CREDIT AS A PERCENTAGE OF DISPOSABLE INCOME



Source: Federal Reserve Bulletin.

Income Distribution and Its Measurement

(Continued from page 7)

harmony by providing each factor of production with a reward just equal to its contribution to total output. Each of these nineteenth century doctrines implied that the lines separating the factors of production also marked the division of social classes. Only later, with an increasingly widespread ownership of property and a growing degree of social mobility did this identification of social classes and economic function disappear from professional analysis. Today economists find it useful to retain the original division of the factors of production, but without the presumption of social class identification.

In recent decades the focus of distributive share analysis has shifted away from discussions of welfare. The blurring of factor ownership classes has forced the virtual abandonment of functional distribution as a welfare indicator. The factors of production, although analytically separate and distinct, are now seen as overlapping at the ownership level. Modern economists, unlike their classical predecessors, recognize that individuals often own and supply several types of productive resources. For example, it is not unusual to find the same individual receiving wage income from his employer, rent income from property leased to tenants, interest income from bonds and savings deposits, and dividend income from equity shares in the capital assets of corporations.

Contemporary income distribution analysis focuses on explanations of the alleged constancy of relative shares. This focus derives largely from economists' study of the Cobb-Douglas aggregate production function. A production function expresses the technological relationship between output and the associated inputs used in the production process. The Cobb-Douglas production function relates national output to only two factors of production, labor and capital, and implies that factor-income shares will be constant regardless of the amounts of the two inputs existing in the economy. In the Cobb-Douglas model, changes in the ratio of labor to capital resulting from dissimilar growth rates of the two inputs would have no effect on factor shares. The widespread acceptance of this model among economists has helped to foster the presumption of constant factor shares.

DISTRIBUTIVE SHARES IN 1970

The statistical series which most closely corresponds to the economist's concept of factor shares is

published by the Department of Commerce in the *Survey of Current Business*. This series shows the distribution of the national income (prior to government taxes and transfers) by type of payment. The percentage breakdown for 1970 is as follows:

Employee Compensation	75.0%
Proprietors' Income	8.4%
Corporate Profit	9.6%
Interest	4.2%
Rental Income of Persons	2.8%
Total	100.0%

The lion's share of national income goes to employees, with corporate profits and proprietors' income running a distant second and third, respectively, and interest accounting for most of the remainder.

The relative size of the slice of the national income pie claimed by labor resources is especially noteworthy in view of the vital and conspicuous role played by capital resources in the production process. One might expect capital resources to claim a large part of the income generated by the world's most "capitalistic" economy. However, a quick calculation from the above figures indicates that approximately 82% of the national income pie was distributed to labor resources, leaving only 18% to be claimed by capital resources. This estimate was made by counting employee compensation as labor-resource income and all profits, interest, and rent as capital-resource income, and by dividing proprietors' income into labor and capital income in the proportion which the share of employee compensation bears to the combined shares of profits, interest, and rent (75.0 to 16.6). Too much faith should not be placed on the accuracy of these figures. For example, probably 3 or 4 percentage points of the 75 percentage point employee compensation share consists of salaries of corporation executives, not usually considered as labor income in the ordinary sense. Furthermore, the allocation of proprietors' income is arbitrary. Nevertheless, the order of magnitude of the estimates is correct and it may safely be said that, in 1970, between three-fourths and four-fifths of the national income pie went to sellers of labor services.

MEASUREMENT AND INTERPRETATION

Although the Department of Commerce's classification of distributive shares is the best the economist has to work with, it is imperfectly suited to his needs. For example, two of the income claims, proprietors' income and corporate profits, are classified by type of business institution rather than by type of economic resource to which payment is made. This

and other discrepancies between theoretical concepts and empirical measures create a host of problems for the researcher in his analysis of the behavior of relative shares. Some of the major problems are discussed below.

Impure Income Categories The Commerce Department's measures of employee compensation, proprietors' income and property income (corporate profits, interest, and rent) are comprised of heterogeneous income elements whereas the wage, rent, interest, and profit components of economic theory are conceptually homogeneous and distinct. Economic theory defines wages as the payment for human effort exerted in the production process; rent as the return to non-reproducible resources supplied in fixed amounts by nature; interest as the return to non-human, reproducible means of production; and profits as the residual reward to entrepreneurship for risk-bearing, coordinating, and innovating activity. In the national income accounts, however, the employee compensation category includes indeterminable amounts of "interest" yield on investment in education and training plus rent on unique ability, in addition to pure wage income. The employee compensation category may also include some entrepreneurial type income because the salaries of top corporation executives are included.

The other national income categories are also a mixture of income elements and thus do not correspond precisely to their theoretical counterparts. The rent share recorded in the national income accounts is comprised mainly of rental income on housing and other leased structures. Very little of it represents the return to scarce natural resources, the theoretical concept of rent. Moreover, only rental income going to *persons* is recorded. Rental income received by corporations is excluded.

Some of the measured interest income consists of interest on consumer debt as well as the yield on tangible capital equipment—the interest concept of economic theory. Finally, neither the corporate profits nor proprietors' income categories consist solely of pure economic profit. The former includes some rent and interest income received by corporations, and the latter includes the implicit wage, rent, and interest income on the labor, land, and capital owned by proprietors and employed in their own enterprises.

Apportioning Proprietors' Income Systematic study of functional shares also encounters a difficulty in splitting proprietors' income into its labor and capital income components. One of the key objectives of empirical research on income distribution

is to test the frequently stated hypothesis of the "remarkable constancy of relative factor shares." As previously mentioned, the hypothesis of constant relative shares is based upon certain theoretical economic models embracing only two factors of production labor and capital. In order to test the hypothesis of factor-share constancy, researchers must consolidate the national income categories into the two groups recognized by the theory. Little difficulty is experienced in consolidating rent, interest, and corporate profits into a capital income component, and assigning employee compensation to the labor income component. But the allocation of proprietors' income, which is an amalgam of labor and capital (including profits) returns, is a different matter.

The question of how the proprietors' share should be divided is one of the most vexing and controversial in the study of income distribution. Three positions have been taken regarding the disposition of proprietors' income. According to one view, it is virtually impossible to identify the labor and capital components and therefore, any separation must be completely arbitrary. Advocates of this view hold that the analysis of relative shares should be limited to those sectors of the economy not dominated by unincorporated forms of business enterprise.

A second view argues that proprietors' income is too important to ignore and that it should all be assigned to the labor share category. Proponents of this view rationalize that a large part of proprietors' income goes to self-employed professionals (doctors, accountants, architects, lawyers) and to proprietors of retail trade establishments, all engaged in predominantly labor type activities.

A third view, adopted by the majority of researchers in the field of income distribution, is opposed to the complete allocation of proprietors' income to labor because such a procedure implies that the property used by the self-employed in their work has a zero yield. Advocates of this position hold that alternative procedures can be used to obtain a reasonably accurate disentanglement of the constituent parts of proprietor income. Suggested techniques include (1) dividing the shares in the same ratio as they are divided in the corporate sector, and (2) imputing to each self-employed person a labor income equal to the annual wages of a worker and a capital income equivalent to the market yield on assets similar to those owned by the self-employed.

Imputation of Government-Sector Income Another problem arises from the way in which product and income originating in the government sector is measured. Government output cannot be valued at

market price because, unlike private output, it is not sold on the market. Instead, it is valued at labor cost of production. That is, in the official statistics, the value of output and income produced in the public sector consists solely of the public payroll. The output contributions of government-owned land and capital are not measured. In short, government product, as officially measured, is 100% labor-intensive. The overstatement of employee contribution to public output may exert an upward bias in labor's share as the relative importance of the government sector in the total economy increases.

The conceptual problems discussed in this section make the task of interpreting movements in income shares treacherous. Observed changes in the shares may be the result of measurement bias rather than of real forces. These hazards weaken the reliability of empirical investigation. It may be hard to determine from the discrepancies between measured and predicted movements of factor shares whether it is the theory or the measurement that is in error.

LONG-TERM TRENDS

Formidable measurement problems notwithstanding, the bulk of the research on functional income distribution has been devoted to explaining the secular behavior of relative factor shares. Table I shows estimates of the percentage distribution of national income since 1900. The data for the period since 1929 were developed by economists in the Department of Commerce. Data for earlier years are the estimates of several scholars, including Simon Kuznets of Harvard, D. Gale Johnson of the University of Chicago, and Irving Kravis of the University of Pennsylvania.

The table indicates that over the century the measured wage share has risen substantially, largely at the expense of the proprietor share and only slightly at the expense of the combined shares of interest, rent, and corporate profits. Although the relative shares, as measured, display a moderate degree of stability over the 25-year post-World War II period, the figures in Table I do not reveal the "remarkable constancy" which economists often proclaim as the most conspicuous characteristic of distributive shares.

Most of the research effort has been devoted to investigation of the trend in labor income. The disparate trends of corporate profits (up from 7% to 12%), interest (down from 5.5% to 3.5%), and rent (down from 9% to 3%) have received relatively little study. Researchers, in their eagerness to test the conclusions of two-factor economic models,

Table I

DISTRIBUTIVE SHARES (PER CENT) OF TOTAL IN U. S. NATIONAL INCOME, 1900-1970

(Decade Averages of Shares for Individual Years)

Decade	Em- ployee Com- pen- sation	Pro- prieters' Income	Cor- porate Profits	Interest	Rent	Total
1900-1909	55.0	23.7	6.8	5.5	9.0	100
1910-1919	53.6	23.8	9.1	5.4	8.1	100
1920-1929	60.0	17.5	7.8	6.2	7.7	100
1930-1939	67.5	14.8	4.0	8.7	5.0	100
1939-1948	64.6	17.2	11.9	3.1	3.3	100
1949-1958	67.3	13.9	12.5	2.9	3.4	100
1954-1963	69.9	11.9	11.2	4.0	3.0	100
1963-1970	71.7	9.6	12.1	3.5	3.2	100

Source: Irving Kravis, "Income Distribution: Functional Share," *International Encyclopedia of Social Sciences*, Volume 7 (New York: MacMillan and Free Press, 1968), p. 134. Reprinted with permission of the Publisher from THE INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES, David L. Sills, Editor. Copyright 1968 by Crowell Collier and MacMillan, Inc.; *Business Conditions Digest*.

have tended to consolidate all non-labor shares into a "property income" category whose overall stability conceals the divergent behavior of its constituent parts.

Explanations of the Trend of Labor's Share How do the experts account for the secular rise in labor's relative share as measured in the national income accounts? Two alternative explanations have been offered. The first emphasizes structural alterations in the product-mix and industry-mix of the economy. This explanation, which appears in the work of E. F. Denison of the Brookings Institution and D. Gale Johnson, implies that the data can be reconciled with the theory of constant shares by showing that income distribution would remain unchanged in the absence of shifts in the composition of output. The second explanation, advanced by Irving Kravis, stresses the differing supply and demand conditions in the markets for labor and capital. Each of these explanations is discussed in greater detail below.

Structural Changes The major structural shifts affecting labor's share include (1) the rise in the proportion of wage earners to proprietors as the corporate form of enterprise increasingly supplanted the individual proprietorship, (2) the growth in the importance of the government sector, and (3) the shift from land-intensive agriculture production to the production of labor-intensive services. Empirical techniques have been devised to measure the influence

of each of these factors on the growth of labor's share.

To estimate the effect of the shift from proprietorship to corporate form of enterprise, researchers divide proprietors' income into its labor and non-labor ("property") components, using any of several statistical procedures. The simplest procedure is to split proprietor income in the same ratio which labor income bears to property income in the rest of the economy. A more sophisticated method (a) assigns a value to each proprietor's labor equal to the annual wages of a hired worker, (b) estimates the annual return on proprietors' property from the observed market yield on similar assets, and (c) adjusts the total of estimated labor and property income components proportionally to agree with reported proprietor income. The shift out of self-employment into wage employment explains some of the rise in labor's share but still leaves approximately seven to ten percentage points (depending on the method used to split proprietors' income) of the rise unexplained.¹

The growth of the government sector accounts for much of the remainder. The effect of the rising relative importance of the government on labor's relative share is estimated by subtracting the government's contribution to national income from both national income and employee compensation. Identical amounts are excluded from both the income and the wages categories because, as previously mentioned, government output is valued solely at the cost of labor input and thus the wage share in the value of government output is 100%.

After the exclusion of the government's contribution to income and the division of proprietors' income into its labor and property components, the relative shares of labor and capital do indeed display a high degree of long-term stability. Kravis' estimates indicate that since 1900, labor's *adjusted* share (including proprietors' labor income and excluding government) has remained within the narrow range of 69% to 76%.²

Finally, the effect on labor's share of the declining importance of agriculture in the product-mix is measured by comparing labor's actual share with what it would be if the relative importance of the different sectors had remained unchanged. It should

be noted that part of the effect of the declining importance of agriculture is also captured in the estimate of the effect of the shift from unincorporated to incorporated business.

In summary, significant adjustments must be made to estimates of factor shares derived from national income statistics before they will square with the theorists' oft-proclaimed "remarkable constancy of the relative shares," which applies to a theoretical construct whose share definitions find no precise counterpart in national income statistics.

Secular Changes in Input Supply and Demand An alternative explanation of labor's rising share goes behind the facade of "structural changes" to focus on the changing conditions of demand and supply in labor and capital markets. This explanation, associated chiefly with Irving Kravis, lumps all non-labor income into one category (capital income) and emphasizes *total* demand for labor and capital rather than the *structural* changes discussed above.

In addition to explaining the rise in labor's share, Kravis' demand-supply approach reconciles the following developments that have occurred in the American economy since the early 1900's: (1) a six-fold rise in the capital stock, (2) a doubling of the man-hour inputs, (3) a more than threefold rise in the real wage rate, and (4) a virtually unchanged real rate of return on capital. Kravis concludes that these trends are due primarily to differences in the responsiveness of the supplies of labor and capital to increases in demand as well as to the tendency for businessmen to substitute relatively low-price capital for relatively high-price labor.

These conclusions are illustrated by the demand and supply diagrams in Chart 1. The long-run supply of labor-hours (S_L) is depicted as less responsive to a rise in the price of labor-hours than is the long-run supply of capital (S_K) to a rise in its price. Economic growth over the century has increased the demand for labor and capital. However, because of the differing supply conditions, the increased demand for labor has greatly affected labor's *price*, whereas the increased demand for capital is reflected in the rise in capital's *quantity*. Because of the lack of responsiveness of the supply of labor-hours to changes in demand, businessmen have had to quadruple the real wage rate to induce the additional labor into employment. The rise in the wage rate relative to the price of capital has also induced businessmen to substitute capital for labor in production and may have stimulated the search for new, capital-using (labor-saving) technology as well. The substitution of relatively cheap capital for relatively dear labor is mani-

¹ I. B. Kravis, "Income Distribution: Functional Share," *International Encyclopedia of the Social Sciences*, Vol. 7 (New York: MacMillan and Free Press, 1968) p. 134. Note that if all of proprietors' income share were lumped with the employee compensation share in Table I, then the resulting "labor's share" would indeed exhibit virtual long-run constancy. A few economists, using this procedure, argue that the statistics strongly support the theory of constant shares.

² I. B. Kravis, "Relative Income Shares In Fact and Theory," *American Economic Review* 49 (December 1959) p. 928.

fested by the sixfold rise in the amount of capital employed versus the mere doubling of man-hours employed. Labor income (price of x quantity of labor) has increased more than capital's income (price of capital \times quantity of capital) because the rise in labor's price relative to capital's price has exceeded the rise in the quantity of capital relative to the quantity of labor.³

THE CYCLICAL BEHAVIOR OF DISTRIBUTIVE SHARES

Although relatively little research has been done on the short-run movements of distributive shares, many economists believe that the evidence is sufficient to establish a definite cyclical pattern for the employee compensation, fixed income (rent and interest), and corporate profit shares. The wage and fixed income shares appear to rise in periods of falling economic activity and to decline in periods of expansion. The share of profits, on the other hand, apparently rises in prosperity and falls in depression.

³ More precisely, labor's income share relative to capital's share may be expressed as $LI/KI = (P_L \times Q_L) / (P_K \times Q_K) = (P_L/P_K) (Q_L/Q_K)$ where LI and KI represent the incomes of labor and capital, P_L and P_K their respective prices, and Q_L and Q_K their respective quantities. Labor's relative share has risen because the price ratio (P_L/P_K) has risen by a greater percent than the percentage fall in the quantity (Q_L/Q_K) ratio.

These cyclical patterns were most conspicuous in the 1930's. During the contraction of 1929-1932, the shares of wages and interest spurted but the profits share fell sharply. With the progress of recovery after 1933, the wage and interest shares sagged and the share of corporate profits rose.

These same cyclical patterns appear in the post-World War II period, although with diminished intensity. Table II shows the percentage income shares at the peak and trough dates of all post-war cycles, as established by the National Bureau of Economic Research. The table clearly reveals the pro-cyclical behavior of corporate profits share and the counter-cyclical behavior of the employee compensation, rent, and interest shares. In each cycle, the corporate profits share was higher at the peak than at the trough. In all but one of the cycles the employee compensation, interest, and rent shares were higher at the trough than at the peak.

Overhead Costs, Unit Profits, and Distributive Shares Economists have advanced several hypotheses to account for the observed cyclical behavior of the relative shares. The most plausible hypothesis holds that the pro-cyclical behavior of profits' share results from the relation between profits per unit of output and unit overhead costs.

Chart 1

INPUT DEMAND AND SUPPLY CURVES

Economic growth shifts upward the demands for labor and capital, increasing the incomes of both. Incomes in 1900 are shown as the smaller, cross-hatched rectangles. Incomes in 1970 as the larger, green rectangles. Labor income has increased more than capital income.

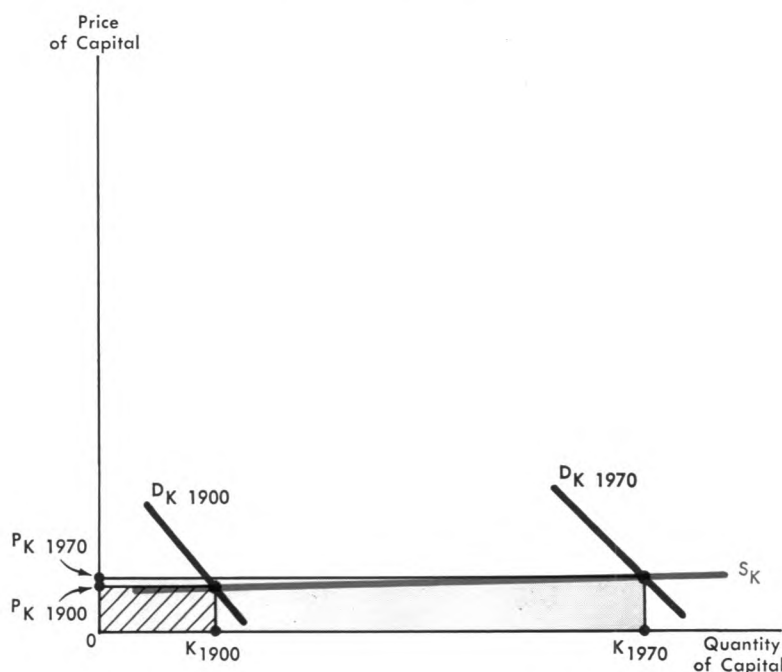
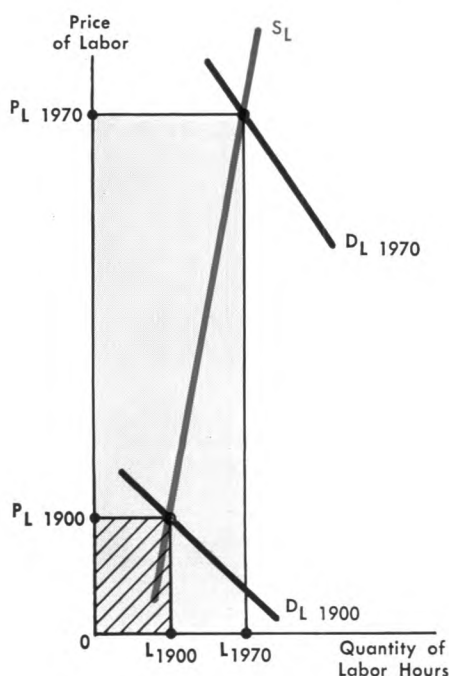


Table II

DISTRIBUTION OF NATIONAL INCOME SHARES (PER CENT) AT THE
CYCLICAL PEAK AND CYCLICAL TROUGH DATES IN
FIVE POST-WAR CYCLES

	1948 IV P	1949 IV T	1953 III P	1954 II T	1957 III P	1958 II T	1960 II P	1961 I T	1969 IV P	1970 IV T
Employee Compensation	63.1	65.4	68.7	68.4	69.9	70.4	70.7	71.5	74.1	75.4
Proprietors' Income	17.5	16.4	13.0	13.2	12.1	12.9	11.2	11.5	8.6	8.4
Corporate Profits	15.0	13.3	13.2	12.6	12.4	10.5	12.4	10.9	10.4	9.1
Rental Income	3.6	4.1	4.2	4.6	4.1	4.3	3.8	3.9	2.8	2.9
Net Interest	0.8	0.9	0.9	1.3	1.5	1.8	1.9	2.2	4.0	4.3
Total Shares	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Business Conditions Digest.

This relation varies with changes in aggregate output. During economic expansions, increased production induced by rising aggregate demand enables firms to spread overhead (i.e. fixed) costs—including the wages of overhead labor as well as rent and interest expenses—over a greater volume of output. Overhead costs per unit of output fall and profit margins rise, thereby enlarging the profits share and diminishing the labor, interest, and rent shares in the value of each unit of output. In recessions, output falls and unit overhead costs rise, thereby squeezing the profits share and enlarging the other shares.

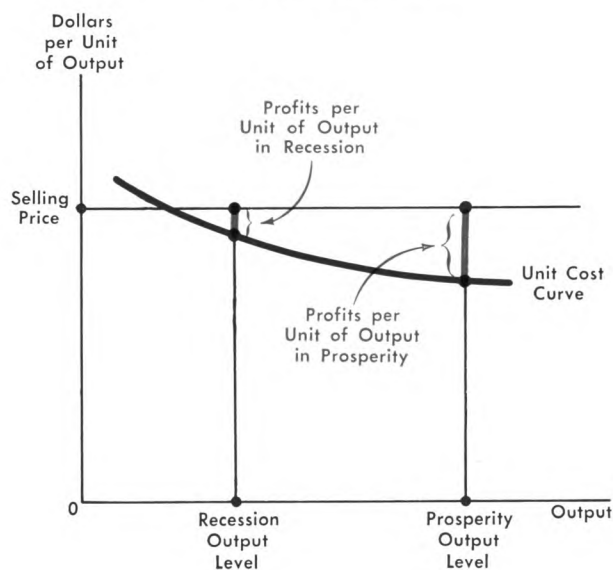
This hypothesis implies that a substantial portion of labor income is a component of the overhead costs of hiring firms. Many economists believe that a sizeable part of the labor force is of the overhead variety. Overhead labor includes supervisory and administrative personnel as well as top management officials whose salaries are largely independent of their firms' output volume. Overhead labor also includes employees retained or "hoarded" by employers in the face of cutbacks in output, either because they possess specialized skills or because employers have made contractual commitments (such as a guaranteed annual wage) to them. Workers may also be retained because employers wish to avoid costs (e.g., severance pay) of laying-off labor as well as the costs of rehiring and retraining workers when business conditions improve.

More precisely, the relation between profits, price, and costs per unit of output can be expressed as: selling price per unit of output equals unit overhead costs plus other unit costs plus unit profits. Overhead costs consist of certain contractually fixed costs (such as insurance, property taxes, rent, and interest on bonded indebtedness) and fixed depreciation

charges as well as the cost of overhead labor. As previously mentioned, unit overhead costs fall as output increases. The category labeled "other unit costs" consists largely of the costs of materials and of unskilled and semi-skilled labor. These unit costs are virtually constant because the firm can adjust its material and unskilled labor inputs in roughly the same proportion as output changes. When output contracts by, say 10%, firms can lay off 10% of their unskilled labor. Employers are less averse to laying off unskilled and untrained workers than professional and highly skilled workers, because the latter are harder to find and the costs of training their replacements would be very high.

Chart 2

UNIT COSTS, SELLING PRICE, AND UNIT PROFITS
AT DIFFERENT OUTPUT LEVELS FOR A
HYPOTHETICAL FIRM



The remaining component of selling price is profits per unit of output. As illustrated in Chart 2, this unit profit component is larger at higher outputs where the cost component of price is smaller. The chart shows the unit cost curve of a hypothetical firm, as well as the price at which it sells its product. The hypothetical unit cost curve is composed of (falling) unit overhead costs plus (constant) other unit costs. As depicted in the chart, profits per unit of output, i.e., the difference between price and unit costs, are larger at the prosperity level of output than at the recession output level.

Several qualifications to the preceding analysis should be noted. The discussion assumed that selling price, wage rates, and productivity remain unchanged over the cycle. In actuality, prices, wages, and productivity tend to expand, albeit at different rates, during the upswing. Changes in those variables cause the curves shown in Chart 2 to *shift*. Rising prices shift the price line. Rising wages and productivity shift the cost curve. Rising wages, which tend to raise the cost curve, may be offset by rising productivity, which tends to lower the cost curve. During the first half of an upswing, productivity growth tends to more than offset wage increases, thereby shifting the cost curve downward. Moreover, firms enjoying some degree of monopoly power may respond to the increase in aggregate demand by raising prices as well as output. Thus, rising prices may combine with falling unit costs (both a shift in the curve and a rightward movement along it) in prosperity to raise unit profits and profits' share.

The favorable influence of prosperity on unit profits is likely to diminish as the expansion proceeds, however. During the later stages of prolonged booms, several forces combine to raise unit costs. As the labor market becomes tight, wage increases accelerate, productivity growth slows, and the unit cost curve shifts upward. Operating rates of plant and equipment reach and then surpass their most efficient levels. These two factors—capacity limitation and wage increases in excess of productivity growth—cause unit costs to rise faster than selling price, thereby encroaching on unit profits. The proportion of profits to the value of output declines. The erosion of profits' share relative to labor's share during the later stages of a business expansion is well-documented. Official figures show that in all but one of the post-World War II cycles the share of corporate profits was lower and the share of employee's compensation higher in the quarter of peak economic activity than in the three quarters immediately preceding the peak.

The Wage Lag Hypothesis An alternative hypothesis that has been advanced in explanation of the shift in favor of profits' share in the upswing and in favor of labor's share in the downswing is the so-called *wage lag* hypothesis. According to this hypothesis, sticky money wages lag behind price increases during booms and price decreases during slumps. Twenty years ago, economists thought the wage lag was the most important factor accounting for the counter-cyclical behavior of labor's share. Recent empirical work has cast doubt on the strength of this effect, however.

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