ing imputed income items to individuals or family units. These imputations affect both the size and the distribution of the tax burden.

Following this approach, a recent Tax Foundation study, Tax Burdens and Benefits of Government Expenditures by Income Class, 1961 and 1965 (New York: 1967), provides an estimated distribution of the corporation tax burden by family income size groups. On assumptions used in that study, Table 6 shows the estimated corporate tax burden under one method of treating imputed forms of income. Total (Federal) corporation tax receipts are taken as representing the tax “burden.”

Half of the receipts was allocated among family income classes on the assumption that their effect was to raise consumer prices. Half of the receipts was allocated on the assumption that

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### Table 6

**Estimated Corporation Tax Burden in Relation to Income of all Families**

**by Income Class 1961**

**Selected Assumptions and Definition of Income**

<table>
<thead>
<tr>
<th>Family Income Class (thousands)</th>
<th>(1) Allocated corporate tax burden</th>
<th>(2) Reported and imputed income</th>
<th>(3) Family money income</th>
<th>(4) Net national product, personal income basis</th>
<th>(5) Allocated tax burden as a percent of income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Col. (1)</td>
<td>Col. (2)</td>
<td>Col. (3)</td>
<td>Col. (4)</td>
<td>Col. (5)</td>
</tr>
<tr>
<td>Under $2</td>
<td></td>
<td>$ 602</td>
<td>$ 10,170</td>
<td>$ 13,742</td>
<td>5.9%</td>
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<tr>
<td>$2 - $3</td>
<td>909</td>
<td>15,928</td>
<td>21,489</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>$3 - $4</td>
<td>1,673</td>
<td>23,613</td>
<td>31,678</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td>$4 - $5</td>
<td>1,640</td>
<td>34,260</td>
<td>46,131</td>
<td>4.8</td>
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<td>$5 - $6</td>
<td>2,227</td>
<td>42,389</td>
<td>57,499</td>
<td>5.3</td>
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<tr>
<td>$6 - $7.5</td>
<td>2,862</td>
<td>63,001</td>
<td>86,474</td>
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<td></td>
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<tr>
<td>$7.5 - $10</td>
<td>3,356</td>
<td>73,620</td>
<td>100,911</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>$10 - $15</td>
<td>3,862</td>
<td>53,863</td>
<td>73,715</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>$15 and over</td>
<td>4,620</td>
<td>31,239</td>
<td>43,226</td>
<td>14.8</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21,751</td>
<td>348,083</td>
<td>474,865</td>
<td>6.2</td>
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</table>

---

a. Includes single person units.
b. The assumptions used in this table cover only one set of possible price effects (see footnote d) and one relating to income (see footnote g). Results of other assumptions can be derived from data in the original study.
c. Money income after personal taxes, as defined in the Bureau of Labor Statistics Survey of Consumer Expenditures 1960-1961. Money income includes wages and salaries, interest, dividends, rent and other income from services plus transfer payments such as social security and public assistance payments, gifts, inheritances and other “windfall” receipts.
d. The total “burden” is assumed to be measured by total (Federal) corporation income tax receipts. Half of these receipts was allocated among income classes in proportion to total consumption expenditures reported in the BLS Survey, and half in proportion to dividends received as reported in the BLS Survey.e. Net national product is used, rather than gross national product, on the assumption that the tax does not significantly affect the proportion of resources used to replace capital equipment. NNP equals GNP less capital consumption allowances.
f. Before personal taxes.
g. The difference between personal income and NNP in the aggregate was allocated among income classes in proportion to personal income; the assumption is that the “income” involved is used for general benefit purposes related to the size of a family’s “personal income.”

their effect was to reduce dividends paid. Thus all of the corporation tax burden was allocated to individuals. However, corresponding amounts of imputed “income” were also allocated to families by income class.

If the tax amounts, so allocated, were related to family money income alone, the corporation tax burden would amount to about 6.2 percent of family income (1961). When the difference between family money income and total net national product was imputed as income to individuals, the corporation tax burden amounted to 4.6 percent of income.

Given the assumptions concerning the burdens on consumers and shareholders, the pattern of distribution is much the same when related to the broad concept of income as when related to family money income alone. The burden of this tax is heavy on low income groups if a substantial part of the tax is assumed to be a cost reflected in prices. The estimated tax, as a percentage of income, was about 30 percent greater for families with incomes under $3,000 in 1961 than for families with incomes from $6,000 to $10,000. On the other hand, the estimated corporation tax burden for families with incomes over $15,000 in 1961 was more than double the average for all families.

If most of the tax were assumed to affect shareholders, the patterns of distribution would become more progressive at the upper end of the income scale. The household survey data, used to allocate the tax burden in Table 6 indicate that in 1961 families with incomes over $15,000 per year accounted for only 5.6 percent of total current consumption expenditures. By contrast, these families accounted for about one-third of total dividends reported in the survey.5

Thus, to the extent the corporation tax is shifted forward, it is a regressive tax and the burden is heavy on low income groups. To the extent that this tax falls on dividends, it is in general a large burden for high income groups, although for many persons at low income levels also dividends are an important source of income.

To the extent the corporation tax has other effects, these impacts on individuals may be modified. A change in the corporation tax may be accompanied by a similar change in government expenditures and by a change in total national output. The corporation tax may largely affect business saving and investment with relatively little immediate effect on dividends or consumer prices. A change in business investment in turn may affect the general level of output and income, so that the effects of the tax include changes in all forms of income, not merely in dividends. In this way the burden on individuals may be more widely dispersed than is indicated by allocating the total revenue of this tax among families on the basis of consumer expenditures and dividends received.

Empirical Analyses of Tax Effects on Factor and Final Product Prices. In the early post-World War II years several attempts were made to utilize the large differences in the corporation income tax rate between the 1920’s, the 1930’s, and the late 1940’s to find evidence of shifting or lack of shifting of this tax.6

Rates of return before tax on corporate capital were substantially higher

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5. This is probably an understatement of the proportion of dividends received by upper income groups. Data from Statistics of Income (individual income tax returns) for 1961 indicate a substantially larger proportion of dividends went to taxpayers with adjusted gross income over $15,000.
6. See bibliography cited in footnote 4 above.
in the late 1940's than in the 1920's, and on this ground some writers concluded that the corporate tax was largely shifted to consumers. Presumably because of the tax, the stock of capital equipment was lower than it otherwise would have been, and the return on investment was consequently higher than it otherwise would have been. The difficulty in these simple comparisons is that during the 1930's and World War II, net investment was small for a long period, so that even without large changes in the corporation tax rate, the relative scarcity of capital could well have accounted for a large difference in rates of return.

Moreover, problems of measuring the stock of capital equipment—especially over a long period of inflation—raise questions about the comparability of data on rates of return.

Some studies pointed to the decline after 1929—and continuing for a time after World War II—in the share of profits in national income as an indication that the corporation tax burden was not shifted but fell largely on stockholders. An apparent decline in ratios of capital stock and stockholders equity to output accompanied this shift in factor shares. The problems of measuring capital stock and taking account of the impact of technological change on labor and capital here also make it difficult to find evidence of tax shifting in "factor shares" in national income or output. (For further discussion, see below pp. 56-60.)

In the early 1960's at least two notable studies attempted to analyze the problem of incidence in greater depth. Professor Harberger's study, "The Incidence of the Corporation Income Tax," (Journal of Political Economy, June 1962, pp. 215-240) was a more sophisticated theoretical approach together with a survey of data on the U.S. economy designed to buttress the realism of his major assumptions. The essential assumptions which he made were that the corporation tax applied to only a portion of the economy and that competitive flows of capital between the corporate and non-corporate sectors would tend to equalize the after-tax rate of return, but at a lower level than in the absence of this tax. Although the corporate tax would, as a result, have important price effects, the tax would reduce the share of output going to owners of capital, in non-corporate as well as corporate enterprise, and capital owners would thus bear the major part of the tax burden.

Harberger's analysis was mainly concerned with flows of capital between different types of industry. He did not examine in detail possible effects of the corporation tax on the national rate of saving, investment, output, and economic growth. His review of the statistical evidence led him to conclude:

... that even allowing for a rather substantial effect of the corporation income tax on the rate of saving leads to only a minor modification of my over-all conclusion that capital probably bears close to the full burden of the tax. (p. 236)

Harberger's analysis, on certain assumptions about the ease of substituting one factor of production for another and one product for another, also provided a basis for distinguishing between effects of the corporation tax on the distribution of income (or the question of "incidence" in his terminology), and effects on "economic efficiency" in the private sectors of the economy.

His estimates of the "efficiency costs" of the corporation tax relate to the reduction in level of capital stock used in the corporate sector as compared with the
non-corporate sector of the economy. The tax would have the effect of shifting capital from the former to the latter and also of reducing the net return on capital after tax in both sectors. This shift of resources resulting from the tax on corporate capital he estimated would mean a "waste" or "efficiency cost" on the order of $1.5 to $2.5 billion per year.7

In 1963 Professors M. Krzyzaniak and R. A. Musgrave published their study, *The Shifting of the Corporation Income Tax, An Empirical Study of Its Short-Run Effect Upon the Rate of Return*. As indicated by the subtitle, this study differed from Professor Harberger's analysis first in that it was a detailed, statistical study with little or no new theoretical analysis, and second that it put primary emphasis on the rate of return, rather than income shares, as the indicator or measure of tax shifting. It also emphasized short-run changes, while Harberger's analysis depended on shifts in investment and changes in capital stock in different sectors of the economy, which require longer time periods.

Musgrave and Krzyzaniak, for the most part, utilized corporation tax return data for the manufacturing sector of the economy from *Statistics of Income* (U.S. Treasury Department) for the period 1935 to 1959. They attempted to identify the significant variables, besides the corporate tax rate, that might influence the rate of return on capital; then through a multiple regression analysis, they estimated the influence of changes in the tax rate as compared with the effects of other variables.

Surprisingly, their statistical evidence indicated more than 100 percent shifting of the tax in terms of the rate-of-return indicator. Even Musgrave and Krzyzaniak apparently had difficulty accepting this implausible result. "... one wonders (they said) whether this high estimated value of shifting might not be due to shortcomings of the model and the data." (p. 47) But after examining several alternative explanations of the results, they concluded that the evidence supports "the hypothesis that an increase in the tax is shifted fully through short run adjustments to prevent a decline in the net rate of return, and that these adjustments are maintained subsequently." (p. 65)

Critics have emphasized the theoretical implausibility of these results. If a tax increase results in more than 100 percent forward shifting into prices, and a rate of return higher by more than the amount of the tax, it would appear that the levying of an increased tax has enabled the firm to make a larger net profit.

Critics have also demonstrated weaknesses in Musgrave and Krzyzaniak's methods of taking account of influences other than the tax rate on the rate of return. In a detailed critique, Richard Slitor showed that other ways of taking account of the influence of cyclical changes in business activity would substantially reduce the apparent degree of shifting.8

Indeed, his and other studies have shown that the major short-run determinant of corporate profits is the level of business activity in relation to the "capacity" of the economy. (This point is elaborated in Chapter III below.)

More recently, Harberger and others have reassessed the Musgrave-Krzyzaniak approach particularly with the purpose of providing better methods of handling "other influences." Their modifications, even more than those made by Slitor, indicate that when "other influences are adequately accounted for, the evidence does not support the hypothesis that the corporation tax is largely shifted in the short-run through changes in the rate of return on capital.

Using a different theoretical approach, Robert J. Gordon analyzed data on corporate returns and prices in U.S. manufacturing over the period 1925-1962 and concluded that there is strong support for the hypothesis that the corporation tax is not shifted in the short run.10

He assumed that corporations practice "mark-up pricing behavior," and examined Statistics of Income data for evidence that corporations raised mark-up margins in response to an increase in the corporate tax rate. His results showed no significant short-run relations between changes in corporate tax rates and mark-up margins in most industries, or profit shares in total income. He concluded that "corporate rates of return in manufacturing were improved by growing productivity of capital in much the same way that wages increased with the growing average productivity of labor." (p. 753)11

Conclusion

Because of the interrelationships between the aggregate variables in the economy—tax rates, tax revenues, government expenditures, the level of business activity and business investment, etc.—much more experimentation is needed in methods of measuring tax effects.

In particular, most of the empirical studies of the effects of taxes on prices—before-tax have been confined to a segment of the economy, usually the manufacturing sector. In dealing with limited parts of the economy, such studies have generally passed over the problems of imputed income.

It may be tentatively concluded that the Musgrave-Krzyzaniak attack on the problem, while it was a pioneering effort in exploring new techniques, did not successfully support the hypothesis of substantial short-run shifting of the corporation income tax.

Studies that have aimed at finding the significant determinants of total corporate profits before tax and dividends in the short run also suggest that the corporation tax has had little influence on these variables. The evidence suggests that corporate profits are a residual form of income in the short run and, as such, would bear the immediate impact of a change in the corporation tax. Chapter III examines a number of such studies.

In the long run, a variety of conditions may lead to some shifting of the corporation income tax. Harberger's analysis was a kind of half-way house in which the shifts in capital between sectors of the economy were the major avenue of tax effects. Other avenues of tax effects, including changes in total national output and in the relation of output to income received by individuals, need exploration.

11. Gordon also made a "cross-section" study of ten groups of industries (two-digit groups in the Standard Industrial Classification), relating his tax-shifting measure to industry concentration ratios. (The concentration ratios were an average over certain years of the percentage of sales accounted for by the largest four firms.) This type of analysis also failed to support the hypothesis of short-run shifting of the corporation tax, although it showed evidence of some relationship between tax shifting and the degree of concentration.
III.
Effects on Profits, Corporate Savings, Dividends, and Investment

Several lines of investigation, not directly concerned with problems of tax incidence, have contributed insights on the effects of the corporation tax both for the short run and the long run.¹

How should we define the “burden” when output changes? Using the definition of tax burden suggested earlier, i.e., the share of output diverted to, or through, government, no one may be worse off as a result of an increase in taxes. The question of diverting some share of increased output to various public or private uses is somewhat different from the question of diverting current income of individuals to governmental uses. More alternatives are available with a larger output and a changing technology. Moreover, with a larger range of alternatives in the level and make-up of national output, it is more difficult to specify the particular alternatives that may be sacrificed through additional government expenditures. This applies both to short-run models of the economy and to analyses of economic growth.³

Another feature of recent models of economic activity is an emphasis on explaining what is happening in major sectors of the economy. Housing construction is separated from business investment in plant and equipment, because these forms of investment are

¹ The “short run” may be defined as a period in which changes in the stock of capital are small enough to be neglected. The “long run” is a period in which the proportions of capital to other factors of production may be presumed to adjust to changes in prices, taxes, etc. Unfortunately, it is difficult to identify actual times when “long run” adjustments may be assumed to be largely completed.


³ Definitions of incidence which assume continuous full employment are not only of doubtful relevance to policy problems, but also are difficult to make “operational” for purposes of statistical estimation. Professor Musgrave noted that once changes in the level of output are admitted as part of the problem, “... the entire problem of incidence appears in a new light. Incidence now deals with the distributional consequences of alternative bundles of stabilization policies. These bundles may involve alternative packages of taxes, or they may involve alternative mixes of tax and monetary restriction, or still other combinations may enter.” (The Theory of Public Finance, New York, 1969, p. 217.)
Chart 3

GNP COMPONENTS ON THE INCOME SIDE
Calendar Years 1947-1967

*Obtained by deducting from GNP the following: capital consumption allowances, indirect business taxes, and personal income from productive services.

**Divided by ten for plotting purposes.

Source: U.S. Department of Commerce.
largely influenced by different sets of variables. Federal government operations are distinguished from those of state and local governments. Financial institutions and changes in the money supply may be separately introduced. A non-financial corporate sector is distinguished from the personal or household sector.

It is in terms of different types of decision-making sectors that progress is being made in the empirical analysis of the effects of taxes, as well as of other governmental policies. The effects distinguished may not be immediately related to the effects on the real incomes of particular groups of individuals—the traditional question of tax incidence. However, the effects of taxes on the level of output, the composition of output, and on major categories of income, whether or not distributed to individuals, constitute leading considerations in the choice of alternative tax policies.

In this chapter, we examine first the short-run influences on corporate profits, dividends, corporate savings, and business investment, and attempt to find evidence of the role of the corporation income tax. We then examine long-run trends in "income shares" for evidence of corporation tax effects.

**Determinants of Corporate Profits**

Post-World War II changes in major types of factor incomes indicate that corporate profits is by far the most volatile element in the short run. As an examination of Chart 3 suggests, the remarkable fact is the relative stability, through business cycles, in most other items on the income side of the accounts.

The post-World War II data suggest that year-to-year changes in total corporate profits can be explained largely as a residual, reflecting changes in GNP itself. If the stable items on the income side of the accounts are subtracted from GNP, a close approximation to actual corporate profits is obtained (see dashed line for corporate profits in Chart 3).

If changes in GNP are most immediately reflected on the income side of the accounts in changes in corporate profits, percentage changes in profits should be closely related to percentage changes in GNP and by some multiple of the latter. A correlation between percentage changes in corporate profits and in GNP published in *The Conference Board Record* showed that over the period 1953-1966, the quarterly percentage change in profits was about 4.8 times the quarterly percentage change in GNP, and that the relationship between these two variables was close.

A somewhat closer relationship can be obtained by using a more volatile index of business activity, such as the index of industrial production. As shown in Chart 4, over the whole 20-year period 1948 through 1967, about 70 percent of the variation in percentage changes in corporate profits is associated with (or can be "explained" by) percentage changes in the index of industrial production.

Using the index of industrial production as an "independent variable" (rather than GNP) also makes it possible to introduce an index of prices or costs as an additional variable. As shown in Charts 5A and 5B (where a logarithmic relation is substituted for relations between percentage changes), a noticeable improvement can be made in the estimated (or "explained") corporate profits by using as independent variables both the index

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4. Slightly more than two-thirds of the variation in corporate profits could be "explained" by percentage changes in GNP. (*Conference Board Record*, August, 1968, p. 32.)
Chart 4
PERCENTAGE CHANGES IN CORPORATE PROFITS RELATED TO PERCENTAGE
CHANGES IN INDEX OF INDUSTRIAL PRODUCTION
Seasonally Adjusted Quarterly Data 1948-1967

Note: The calculated relationship between the two series is $Y = -1.0307 + 2.2713 X$, where $Y$ is the quarterly percentage change in corporate profits (excluding profits originating in the rest of the world and inventory valuation adjustment) and $X$ is the quarterly percentage change in the index of industrial production. ($R^2 = .896$) (A technical appendix with further statistical details on this and the following charts is available on request.)

Source: U.S. Department of Commerce and Federal Reserve Board. Computations by Tax Foundation.
CORPORATE PROFITS RELATED TO INDEX OF INDUSTRIAL PRODUCTION AND INDEX OF LABOR COST PER UNIT OF OUTPUT IN MANUFACTURING

Seasonally Adjusted Quarterly Data 1948-1967

Note: The calculated relationship between corporate profits (total corporate profits excluding profits originating in the rest of the world and inventory valuation adjustment) and the index of industrial production is

$$\log Y = 0.4411 + 1.0557 \log X,$$

where $Y$ is corporate profits and $X$ is the index of industrial production. ($R^2 = 0.8958$)

Note: The calculated relationship between corporate profits, the index of industrial production, and the index of labor cost per unit of output in manufacturing is

$$\log Y = 1.4325 + 1.4875 \log X_1 - 1.3888 \log X_2$$

where $Y$ is corporate profits, $X_1$ is the index of industrial production, and $X_2$ is the index of labor cost per unit of output in manufacturing. ($R^2 = 0.957$)
of industrial production and the index of labor cost per unit of output in manufacturing. A rise in labor cost per unit of output is associated with a fall in profits. (Further statistical details are provided in a technical appendix which is available on request.)

No improvement in the explanation of quarterly changes in corporate profits for the period 1948-1967 was obtained by including the effective corporate tax rate (the percentage of tax liability to total corporate profits) as an "independent" variable. However, a direct relation between the effective corporate tax rate and short-run changes in corporate profits could not be expected unless changes in the corporation tax were quickly shifted forward into prices. The very fact that short-run changes in corporate profits can be explained as a residual item on the income side of the national accounts tends to contradict the proposition that short-run shifting of this tax into prices occurs. A residual item would tend to absorb changes in any tax levied on it. 5

5. A residual item on the income side of the accounts would be likely initially to absorb a change in any taxes levied on business costs.

<table>
<thead>
<tr>
<th>Table 7</th>
</tr>
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<tbody>
<tr>
<td>Corporate &quot;Cash Flow,&quot; Dividends, Payout Ratio, and Effective Tax Rates</td>
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<tr>
<td>Calendar Years 1947-1967</td>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash flows</th>
<th>Dividends</th>
<th>Payout ratio</th>
<th>Effective tax rate</th>
</tr>
</thead>
<tbody>
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<td>1947</td>
<td>$26.0</td>
<td>$ 6.3</td>
<td>24.3%</td>
<td>35.9%</td>
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<tr>
<td>1948</td>
<td>29.7</td>
<td>7.0</td>
<td>23.6%</td>
<td>35.5%</td>
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<td>1949</td>
<td>26.5</td>
<td>7.2</td>
<td>27.2%</td>
<td>36.0%</td>
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<td>1950</td>
<td>33.7</td>
<td>8.8</td>
<td>26.1%</td>
<td>41.8%</td>
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<td>1951</td>
<td>31.8</td>
<td>8.6</td>
<td>27.0%</td>
<td>50.8%</td>
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<td>31.0</td>
<td>8.6</td>
<td>27.7%</td>
<td>49.9%</td>
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<td>33.5</td>
<td>8.9</td>
<td>26.6%</td>
<td>50.0%</td>
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<td>35.5</td>
<td>9.3</td>
<td>26.2%</td>
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<tr>
<td>1955</td>
<td>44.4</td>
<td>10.5</td>
<td>23.6%</td>
<td>44.4%</td>
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<tr>
<td>1956</td>
<td>46.1</td>
<td>11.3</td>
<td>24.5%</td>
<td>44.5%</td>
</tr>
<tr>
<td>1957</td>
<td>46.8</td>
<td>11.7</td>
<td>25.0%</td>
<td>44.9%</td>
</tr>
<tr>
<td>1958</td>
<td>44.3</td>
<td>11.6</td>
<td>26.2%</td>
<td>45.9%</td>
</tr>
<tr>
<td>1959</td>
<td>52.0</td>
<td>12.6</td>
<td>24.2%</td>
<td>45.5%</td>
</tr>
<tr>
<td>1960</td>
<td>51.6</td>
<td>13.4</td>
<td>26.0%</td>
<td>46.2%</td>
</tr>
<tr>
<td>1961</td>
<td>53.5</td>
<td>13.8</td>
<td>25.8%</td>
<td>45.9%</td>
</tr>
<tr>
<td>1962</td>
<td>61.3</td>
<td>15.2</td>
<td>24.8%</td>
<td>43.7%</td>
</tr>
<tr>
<td>1963</td>
<td>64.8</td>
<td>16.5</td>
<td>25.5%</td>
<td>44.3%</td>
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<tr>
<td>1964</td>
<td>72.3</td>
<td>17.8</td>
<td>24.6%</td>
<td>42.4%</td>
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<tr>
<td>1965</td>
<td>81.7</td>
<td>19.8</td>
<td>24.2%</td>
<td>41.0%</td>
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<tr>
<td>1966</td>
<td>88.3</td>
<td>21.5</td>
<td>24.3%</td>
<td>41.2%</td>
</tr>
<tr>
<td>1967</td>
<td>88.6</td>
<td>22.8</td>
<td>25.7%</td>
<td>41.2%</td>
</tr>
</tbody>
</table>

a. Corporate profits after taxes plus corporate capital consumption allowances.
b. Percentage of dividends to cash flow.
c. Percentage of tax liability to corporate profits before tax excluding inventory valuation adjustment. Includes State income tax liabilities.

Dividends

A series of studies of corporate financial policies over the past decade has consistently shown a close relation between dividends paid and corporate “cashflow,” i.e., corporate profits after tax plus capital consumption allowances.

Tax depreciation policy has changed so radically over the past 15 years that it seems reasonable to assume that corporate management, in determining dividend policy, looks at gross income after taxes, rather than at net income, which is directly affected by changes in depreciation methods. Not only economic research but much literature in corporate accounting and finance testify to the importance of cash flow in determining both dividends and corporate saving.

As shown by Table 7 dividends have fluctuated around an average of 24 percent of cashflow over the past two decades, and the variation from this average has been small. The effective corporate tax rate (tax liability/corporate profits before tax) was about 36 percent in the years 1947 to 1949. It rose to over 50 percent during the Korean War, and fell to an average of 46 percent for the period 1954-1963, and to 41 percent in the years 1965-1967.

The constancy in the payout ratio is evident not only for all corporations, but also for nonfinancial corporations, and for the manufacturing segment of corporate industry.6

Thus changes in cashflow may be considered the chief determinant of corporate dividends. Since more than half of cashflow consists of capital consumption allowances, which show almost no cyclical variation, the cyclical variation in cashflow is less than that in corporate profits before tax. The cyclical variation in dividends is less than in cashflow, so that the “payout” ratio rises during recessions and falls during expansion periods.

The corporation tax serves to reduce cashflow if there is little or no forward shifting of the tax. The preceding section indicated that there is little or no effect of the corporation tax on profits before tax in the short run. The presumption then is that an increase in the corporate tax would have some effect in reducing corporate profits after tax, and thereby on cashflow and dividends. Conversely, a decrease in this tax should increase cashflow and dividends.

The notable fact about dividends, however, is their relative stability in the face of large fluctuations in corporate profits. This suggests that the effect of changes in profits before tax, and the tax itself, on dividends operates with considerable lag.7 It also indicates that the immediate effect of the corporation tax is largely on undistributed profits, or corporate saving.

Table 7 shows that changes in dividends continue to be very closely related to changes in cashflow. Despite recent changes in the corporation tax rate and in tax depreciation policy, the relationship between cashflow and dividends appears to be largely unaffected.

The fluctuations in the payout ratio are clearly related to the level of business activity (Chart 6). An increase in the payout ratio is to be expected during

7. The FED-MIT quarterly econometric model relates dividends to a weighted average of cashflow over the preceding seven quarters. (Federal Reserve Bulletin, January, 1968, p. 40.)
Chart 6
CORPORATE CASHFLOW, PROFITS, DIVIDENDS, UNDISTRIBUTED PROFITS, PAYOUT RATIO, AND INDEX OF UTILIZATION IN MANUFACTURING
Seasonally Adjusted Quarterly Data 1948-1967

Source: U.S. Department of Commerce and Federal Reserve Board.
recessions because the general corporate practice is to maintain a stable dividend policy. 8

For the purpose of the present study, the relationship between dividends and cashflow was estimated using quarterly

8. Dr. John Brittain, in his study Corporate Dividend Policy (The Brookings Institution; 1966), explored a number of possible explanatory models of dividend policy covering mostly the period 1929-1960. His work suggested that the individual income tax, as well as interest rates, played an important part in determining a "target" payout ratio. With the growing importance of institutional investment and more widespread ownership of corporate stock, one would doubt the continued significance of individual income tax rates in dividend policy. The data for the years 1963 through 1967 do not lend support to the significance of individual income tax rates and interest rates in determining dividend policy. On the basis of Brittain's estimates, changes in these variables in the last four years should have increased the target payout ratio by nearly 10 percentage points. The actual payout ratio has remained approximately constant.

Another recent study tested the hypothesis that business investment in plant and equipment was an influence on the payout ratio: presumably a high level of investment would tend to reduce the ratio of profits paid out. The study found, however, that business investment contributed little to explaining changes in the payout ratio. (Stephen J. Turnovsky, "The Allocation of Corporate Profits between Dividends and Retained Earnings," Review of Economics and Statistics, Vol. 44, No. 4, November 1967, pp. 583-589.)
data for the period 1948-1967 (Chart 7). Since the payout ratio fluctuates through the business cycle, dividends were also related to a newly available index of business activity which contains no trend, namely the Federal Reserve index of utilization in manufacturing. Introducing this index as an additional variable provides a slightly improved explanation of changes in dividends.

Changes in the effective corporate profits tax rate over the past 20 years have shown no significant relation to changes in dividend payments or to the payout ratio. Changes in the corporate tax rate add nothing directly to the "explanation" of dividends as a function of cashflow. The corporation tax may affect cashflow through its possible effects as an element in fiscal policies affecting

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**Chart 8**

**UNDISTRIBUTED PROFITS RELATED TO CORPORATE CASHFLOW AND INDEX OF LABOR COST PER UNIT OF OUTPUT IN MANUFACTURING**

Quarterly 1948-1967

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**Note:** The calculated relationship between undistributed corporate profits, corporate cashflow, and the index of labor cost per unit of output in manufacturing is

\[
\log Y = 5.4365 + 1.2954 \log X_1 - 3.261 \log X_2
\]

where \(Y\) is undistributed corporate profits, \(X_1\) is corporate cashflow, and \(X_2\) is the index of labor cost per unit of output in manufacturing. (\(R^2 = .8966\))
business activity, but it appears to have little or no direct, short-run effect on dividends.

Undistributed Corporate Profits

Since short-run changes in corporate profits before tax can be explained as a residual income item, and dividends show little cyclical fluctuation, the residual nature of profits must show up primarily in undistributed profits. The cyclical fluctuations in the latter are in fact much larger than in total corporate profits (Chart 6).

Given the relative stability in dividend payments, the same variables that explain short-run changes in corporate profits before tax also explain short-run changes in undistributed corporate profits, but with a multiplied effect. Changes in business activity result in very large relative changes in undistributed profits because this is the ultimate residual item on the income side of business accounts (Chart 8).

Because of the relative stability in dividend payments, the corporation income tax also plays an important role in multiplying the relative short-run fluctuations in undistributed profits. Because the base of the tax includes dividends, changes in the tax base will be reflected more sharply in undistributed profits. For illustrative purposes, let us assume that dividends are stable through a business cycle at $15 billion, while total corporate profits fluctuate by 20 percent around an average of $50 billion, i.e., from a low of $40 billion to a high of $60 billion. Profits after tax would correspondingly fluctuate by 20 percent, from a low of $20 billion to a high of $30 billion. Undistributed profits, however, would fluctuate by 50 percent, from a low of $5 billion to a high of $15 billion, around an average of $10 billion. (The figures are roughly representative of the magnitudes of these variables in late 1950's and early 1960's.)

Given the large cyclical fluctuations in corporate profits, and the relative stability in dividend payments, the corporation tax, even at a fixed rate, has a large effect on short-run changes in corporate savings. The tax serves to multiply the effect of cyclical influences on corporate profits. The degree of multiplication depends on the rate of the corporation tax and the average ratio of dividends to profits before tax.

Through its effect on undistributed profits, the corporation tax may be a significant factor tending to increase cyclical fluctuations in business investment. Internal sources of funds decline rapidly in a recession and increase rapidly during a period of business expansion. The choking off of internal savings during a recession may intensify a fall in business investment. The rapid expansion of corporate savings in a boom period may permit business investment to rise further than it otherwise would.

Business Investment

One of the most controversial and difficult problems in economic research in the past two decades has been the nature of the "investment function," that is, the significant determinants of the level of business investment.

In their study, *The Investment Decision: An Empirical Inquiry* (Cambridge, Mass., 1957), John R. Meyer and Edwin Kuh found, for a cross-section analysis of firms in the period 1946-1950, that there was a discontinuity in the effect of sources of funds—the size of internal funds was an important determinant of investment when the economy was op-
erating below capacity. However, "In the long-run... investment consistently tended to be more closely related to technological needs, as defined by the capacity utilization variable, than to financial requirements." A later study by one of the same authors also concluded that at capacity levels the major determinant of investment expenditures was the "capacity-output relationship." A series of other studies have also shown that the central factor in corporate investment decisions is the need to expand capacity as full utilization is approached. These studies have typically failed to find adequate ways of taking into account the prospective return on investment as an independent variable. Simple approaches to estimating the effect of changes in the corporation tax rate did not seem to yield significant results. Yet a corporation tax rate of nearly 50 percent must be an important influence on investment if business management looks primarily at the net rate of return after taxes in making decisions on investment projects.

Debate over the investment tax credit and liberalized depreciation in the early 1960's resulted in more attention being given to the rate of return by students of the "investment demand function." In particular, the work that went into the Brookings Quarterly Econometric Model of the United States, explicitly made the rate of return on capital a determinant of "desired capacity" and, in turn, of the demand for investment. The empirical work following this formulation, and taking account of recent corporate tax changes, indicated that the rate of return on capital after taxes was a significant influence on the aggregate rate of investment.

The Federal Reserve-MIT econometric model of the U.S. economy also incorporates the corporation tax rate and other features of the tax law as determinants of the "equilibrium capital-output" ratio.

It would appear that the need for increased capital equipment as output grows is the major determinant of the "full employment" level of investment. Different tax rates and interest rates will influence the "desired" capital-output ratio at any level of output, but these may be obscured in the short-run by changes in the level of output.

However, if a "permanent" tax change is made that influences the "desired" or equilibrium capital-output ratio, then the rate of investment at "full utilization" will be altered. Given a close tie between investment, technological change, and productivity, the rate of economic growth can be significantly influenced by a change in the tax structure.

Investment is the bridge between short-run and long-run effects. Short-run effects on the level of output and income are very important because of their large potential magnitude. Business investment and corporate profits could fall by $10 billion or more in one year, and output by a larger amount. (For example, gross corporate product—the corporate sector of GNP—fell by $9 billion (at an annual rate) from the first quarter of 1960 to the first quarter of 1961, and

corporate profits before tax also fell by $9 billion over the same period.)

These magnitudes are large as compared with a recent estimate of the "efficiency cost" the corporation income tax, namely about $2 billion a year (see above, pages 41, 42), and also as compared with the annual amount "normal" growth in corporate output.

Over the period 1948 to 1967, gross corporate product in current dollars grew at an annual rate of about 6 percent per year, and corporate profits at an annual rate of about 5 percent per year. (In constant dollars, the rate of growth of gross corporate product has been slightly over 4 percent per year.) At the 1968 level of profits, the long-run growth would be about $41 1/2 billion per year. The growth in business investment in plant and equipment would be about $3 billion a year at these long-term rates of increase.

A fairly small change in these magnitudes, if they constituted a permanent change in the growth rate, could make a substantial difference to output and productivity over a period of years. A good deal of technological change is closely tied in to business investment. A number of recent economic studies have attempted, without much success, to disentangle how much of technological improvements are "embodied" in new plant and equipment. Whatever the direct relation between new equipment and new technologies, the application of new knowledge is usually implemented through new investment.

Trends in Income Shares

The long-run effects of the corporation tax should show up in the trends in different types of income, although here also the other factors at work obscure the effects of the tax. Relatively few changes in the corporation tax rate have occurred since World War II.

The post-World War II data show a surprising stability in some income shares, and substantial change in others. Table 8 shows a breakdown of GNP on the income side of the accounts. This contrasts with the usual procedure of examining factor shares in terms of national income "at factor cost." If the analysis of incidence in Chapter II is essentially correct, the use of national income at factor cost omits significant effects of taxes.

As indicated in Table 7 (page 49), the last two decades provide four periods of different levels of corporation tax rates. The first was the immediate post-World War II period when the effective rate of the tax was about 36 percent. The second was the Korean War period when the effective rate was about 50 percent. The third was the period 1954 to 1962 when the rate averaged about 46 percent. Finally the reductions under the Revenue Act of 1964, as well as the investment tax credit, lowered the effective rate to about 41 percent.

Throughout most of the post-World War II period corporate profits before tax did not grow as fast as did GNP. Part of this slow growth in profits was due to a rapid growth in depreciation allowances from the very low level of the late 1940's. However, even with adjustments for changes in depreciation methods, profits grew more slowly than did GNP in the period 1947 to 1961 (Chart 9). Since 1961, capital consumption allow-

Chart 9
CORPORATE PROFITS SHARE OF GROSS CORPORATE PRODUCT
UNDER ALTERNATIVE DEPRECIATION METHODS,
NONFINANCIAL CORPORATIONS
Selected Years 1929-1966

NIA vs. alternatives based on historical cost depreciation

NIA vs. alternatives based on current price depreciation

Percent

1929 47 50 55 60 65

Note: "NIA" refers to national income accounts concept.