

EFFECTIVE AVERAGE U.S. CORPORATION INCOME TAX RATES

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ABSTRACT

This study computes effective average corporation income tax rates for IRS "minor industries" in mining and manufacturing for the 1963 tax year. Effective tax rates take into consideration the tax reductions that result from "special tax provisions" — those tax laws and rules which cause the actual tax structure to deviate from a simple basic corporation income tax structure.

The average effective tax rate for 110 industries for 1963 is 39 per cent. The deviation between this average and 52 per cent (the nominal rate on income in excess of \$25,000 in 1963) provides evidence of the pervasiveness of special tax provisions and allowances. The standard deviation is about 7 percentage points, indicating a non-uniform effect of special tax treatment on various industries. Several applications of these data are suggested.

I. Introduction

THIS study examines the disparate treatment of industries in the mining and manufacturing sector of the economy by the corporation income tax. The income tax burdens of different industries are compared, using estimated effective average corporation income tax rates for the 1963 tax year.¹

The effective average corporation income tax rate is the ratio of actual tax liabilities to true accounting profits. These liabilities and profits are derived from various ad-

justments to tax liabilities and accounting profits reported on corporation income tax returns. The derivation consists of first constructing a list of those special tax provisions which cause the actual corporation income tax structure to deviate from a "basic, simple income tax system" and then computing the reduction in taxable income that results from these special provisions. True accounting profits are then computed by adding to reported accounting profits the reduction in taxable income arising from special tax provisions. Actual tax liabilities are constructed in a similar fashion. These adjustments are necessary in order to delete tax liabilities that would not occur under the "basic, simple income tax system" and to add those that would occur but presently are excluded. A more precise definition of the effective average corporation income tax rate is developed in section II.

Many of these special provisions were enacted because of a desire by Congress to encourage some industries with specific incentives.² Therefore one should exercise extreme caution before interpreting any effective average tax rates reported in this paper as "unfair" or "undesirable." The corporations comprising the industries in this study have done nothing illegal in order to lower their effective average income tax rates. They have simply taken advantage — to differing degrees — of the multitude of special tax provisions and rulings that have been adopted over the years.

These special tax provisions have frequently resulted from pressures by special interest groups which have often been able to influence public policy decisions in the United States.³ These interest groups are

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¹This paper summarizes the main findings in Chapter IV of my unpublished Ph.D. thesis (Siegfried, 1972). A more detailed description of much of the material summarized herein can be found in that chapter.

²For example, the provision permitting immediate write-off of expenses for exploration and development costs in the petroleum industry was enacted to encourage these activities so that the level of domestic petroleum reserves would increase.

³See, for example, Mintz and Cohen (1971);

well-organized, have substantial financial resources at their disposal, are well informed on pending legislation, and are cognizant of the most effective mechanisms for influencing policy. The effectiveness of special interest groups is demonstrated by the provisions of the federal income tax law relating to capital gains, earnings in excess of \$25,000, accelerated depreciation, bad debt reserves of financial institutions, depletion allowances, etc. In addition to such general and industry-wide relief measures, many special tax provisions apply only to a single firm or to a small group of firms.⁴

Stern (1965 and 1973); Green (1972); or Lundberg (1969).

⁴Examples of special tax provisions are not difficult to find. Section 518 of the Revenue Act of 1951 permits special relief for any taxpayer "engaged primarily in the newspaper publishing business" which in a certain short time period "consolidated its mechanical, circulation, advertising and accounting operations with those of another newspaper in the same area" — a circumstance that applied to two Fort Wayne, Indiana, newspapers, the *Journal-Gazette* and the *Sentinel*. It is unlikely that any other newspapers in the country could qualify (Oakes, 1962).

It is no secret that a provision of the 1962 tax bill entitled "Income Tax Treatment of Certain Losses Sustained in Converting from Street Railway to Bus Operations" applied exclusively to the Twin Cities Rapid Transit Company of Minneapolis-St. Paul, Minnesota. The Twin Cities bill was championed by then Senator Eugene McCarthy (Congressional Record, 1962).

A dramatic example of the impact of an industry's influence on the tax structure is the mail blitz in 1962 opposing the proposal for withholding taxes on dividends and interest. The U.S. Savings and Loan League — the trade association of savings and loan companies — organized a massive letter-writing campaign by the users of savings and loan institutions. Letters to the League's 4,800 member institutions asked each one to write its customers suggesting that they write their senator indicating their opposition to the bill authorizing tax withholding for dividends and interest. The results were astounding: Senators Paul Douglas and John Sherman Cooper each received over 60,000 letters. At the beginning of the mail campaign, Savings and Loan League Officials indicated that they did not have the votes to defeat the withholding plan. After the mail blitz, however, the Senate Finance Committee voted eleven to five against the bill, and the Senate as a whole voted sixty-six to twenty against withholding (McCartney, 1962).

II. Definition of Effective Average Corporation Income Tax Rates

The construction of true accounting profits requires controversial, normative decisions concerning the legitimacy of many deductions and tax exclusions. This study makes such decisions in a manner generally consistent with the Treasury Department's treatment of tax deductions and exclusions for their purpose of computing the "tax expenditure budget," a concept first developed in 1967 by Stanley Surrey, then Assistant Secretary for Tax Policy, United States Treasury (Surrey, 1973). In a November 15, 1967 speech, Surrey said that ". . . through deliberate departures from accepted concepts of net income and through various special exemptions, deductions and credits, our tax system does operate to affect the private economy in ways that are usually accomplished by expenditures — in effect to produce an expenditure system described in tax language." Surrey recognized the difficulties inherent in determining (1) which tax rules are integral to a tax system in order to produce a balanced tax structure and the desired net income, and (2) which tax rules depart from that balanced structure and net income concept in order to provide relief, assistance, or incentive for a particular group or activity. When the Treasury prepared the first tax expenditure budget, for Fiscal Year 1968, items were included as tax expenditures on the basis of "the major respects in which the current income tax bases deviate from widely accepted definitions of income and standards of business accounting and from the generally accepted structure of an income tax" (U.S. Treasury, 1968, p. 327). A standard accepted in that analysis, which is crucial to the present study, is the assumption inherent in current tax law, that corporations are separate entities and subject to income taxation independently from their shareholders.

The Treasury's construction of an admittedly arbitrary list of provisions that do not conform to a basic, simple income tax structure does not settle the issue. Debate on what constitutes such a tax structure has

often been heated.⁵ Recently the Treasury has felt it necessary to state formally that its estimates of "tax expenditures" should not be interpreted as its identification of tax subsidies (Weidenbaum, 1972).

The debate over the proper definition of a basic, simple income tax structure has serious implications for this study. Since the present analysis is limited to the corporate mining and manufacturing sector, however, many of the controversial issues are irrelevant. Fortunately, there is more general agreement concerning the rules necessary to provide a balanced tax structure and proper measure of net income for corporations than for individuals. In addition, the analysis employed in this study can be applied to various normative definitions of a comprehensive income tax base and a desirable rate structure. Several alternative calculations are presented here for the convenience of readers who may have varying ideas as to what should be considered a special provision. Additional variations would not be difficult to generate.

The effective average corporation income tax rates calculated in this study represent deviations from one definition of a standard effective average tax rate that would evolve from a basic, simple corporation income tax system. This income tax structure is defined by the tax provisions which remain after the "special" tax provisions are excluded. As shown in detail in section III, it consists of a single proportional tax rate of 52 per cent on taxable income for 1963 (the rate has since been lowered to 48 per cent). It provides for government sharing in losses as well as profits and permits the deduction of certain costs of operation (costs of materials, repairs, bad debts, rent paid on business property, other taxes paid, interest paid, certain amortization, economic depreciation and depletion costs, depreciation on advertising and research and development, employee benefits, labor costs, losses from theft, spoilage, etc., and the total compensation of officers). The basic tax structure also includes the foreign tax credit provision. (An alternative calculation

that excludes the foreign tax credit provision is also made.)⁶

⁶The effective average tax rates computed in this study are intended to represent the tax burden on an industry from the industry's point of view. In regards to most tax provisions this is consistent with the tax burden from the Treasury's point of view. The foreign tax credit is a significant exception. It permits corporations paying taxes to foreign governments to claim these taxes as a credit against their U.S. income tax liability up to the limitation of the U.S. tax rate on the foreign earnings. From the industry's point of view taxes paid to foreign governments are a one-for-one substitute for taxes paid to the U.S. government. If the foreign government does not collect taxes up to the statutory U.S. tax rate the industry will have to pay the difference to the U.S. Treasury. Only if the foreign country's rate of taxation exceeds the U.S. tax rate is there an incentive for firms to attempt to hold down foreign tax rates. At foreign tax rate levels up to the U.S. tax rate, domestic firms operating in foreign countries have no preference regarding the foreign country's tax rates. (Actually the problem is more complicated than this since restrictions on the foreign tax credit [for example, requiring some repatriation of profits] do limit the substitutability of foreign and U.S. taxes.) Under these conditions the foreign tax credit should be treated as part of the simple, basic tax structure. To consider the foreign tax credit as a special provision would be to discriminate between taxes paid to foreign governments on foreign earnings and taxes paid to the U.S. Treasury on domestic earnings. From the industry's perspective this does not seem sensible.

On the other hand, it has frequently been suggested that the extractive industries "abuse" the foreign tax credit provision. These industries, which would expect to pay royalties on the minerals they extract from the foreign country, prefer to substitute higher foreign taxes (so long as they are less than the U.S. rate) for higher royalty payments. This incentive occurs because royalties are a business *deduction* for tax purposes, while foreign tax payments are a *credit* against tax liabilities. If the foreign government changes a dollar of royalties into a dollar of taxes, the U.S. firms involved will be able to improve net after-tax income. The extent of this type of substitution between royalties and taxes has not, to my knowledge, been documented. Undoubtedly it occurs to some degree, but it is unlikely that foreign taxes substitute entirely for royalty payments. Therefore the proper treatment of the foreign tax credit involves a partial treatment as a "special" tax provision. Since there is no way to estimate which part of the foreign tax credit acts as a special provision and which part is simply the substitution of foreign taxes for U.S. taxes, two estimates are made, the first treating none of the foreign tax credit as a special provision, the second treating all of the foreign

⁵See, for example, the debate between Bittker (1969) and Surrey and Hellmuth (1969).

The deductions, exclusions, and special tax rates which are treated as "special" provisions in this study include: the surtax exemption on the first \$25,000 of taxable income; the excess of percentage depletion allowances over an estimate of cost depletion (i.e., that amount of amortization that would arise if depletion allowances were based on capital costs); the provision which permits treating long-lived advertising as a current expense rather than depreciating it over its extended lifetime; the Western Hemisphere Trade Corporation allowance, which permits a special deduction whose effect is to reduce the eligible corporation's tax rate by 14 percentage points; the special capital gains tax rate of 25 per cent; the special treatment of royalties from coal and iron ore deposits as capital gains; the special treatment of certain income of the timber industry as capital gains; the investment credit on qualified investments; the provisions permitting special deductions of expenses incurred for the exploration and development of mineral deposits; the deduction for exploration expenses on oil and gas properties found to be worthless; the provision which permits the immediate expensing of research and development expenditures instead of requiring them to be amortized over the useful life of the research and development output; the special exemption from income tax on the interest on state and local bonds, which creates a net transfer from the federal government to state and local governments and to bondholders; and special tax provisions which permit accelerated depreciation methods (in contrast with straight line depreciation) and the use of tax lives that are shorter than the economic lives of buildings and equipment.⁷

It is necessary to exclude the provision which taxed corporations (in 1963) on 15 per cent of their income received as dividends from domestic subsidiaries. The Treasury does not include this allowance as a "special" provision and that precedent is followed here. Double taxation provides a

tax credit as a special provision (not allowing it even as a deductible item).

⁷Details of the procedures can be found in Siegfried (1972), Chapter IV.

logical reason for eliminating this provision. This should not be interpreted as a judgment that the 15 per cent tax on intercorporate dividends is undesirable. Such a policy recommendation would require consideration of the incentive effects of the provision and their impact on efficiency as well as its redistributive implications.

A discussion of the details of the method of handling three of the more interesting and quantitatively significant provisions will serve to suggest the technique used for all of the special provisions.

1. *The \$25,000 surtax exemption.* The \$25,000 surtax exemption provides for different marginal tax rates on income above and below \$25,000. In 1963, corporations were subject to a tax of 30 per cent on all net income plus an additional 22 per cent surtax on income in excess of \$25,000 per year.⁸ The surtax exemption was initially intended to help small businesses (thus qualifying it as a special tax provision), but it has been abused to the extent that it often substantially reduces the taxes of certain large firms. By incorporating many subsidiaries, a number of large firms were able in 1963 to collect multiple surtax exemptions. The relatively low cost of incorporation encouraged this practice, since each additional \$25,000 surtax exemption saved a large corporation \$5,500 per year

⁸Unfortunately some tax returns for accounting periods ending between July 1, 1963, and June 30, 1964, applied to a period when different marginal tax rates were in effect. A two-stage reduction in the income tax rates for corporations was prescribed in the Revenue Act of 1964. The first stage was effective on January 1, 1964. Beginning on this date, the nominal tax was reduced from 30 to 22 per cent. The surtax, generally applicable to taxable income in excess of \$25,000, was raised from 22 to 28 per cent for January 1 through December 31, 1964. Thereafter, it was reduced to 26 per cent. For taxable years overlapping January 1, 1964, income tax was computed under both the old and new rates; the new rates and the actual tax liability for the year were then determined by prorating the two tentative income tax amounts according to the number of days in the tax year under each law. Therefore the applicable nominal marginal tax rate on income in excess of \$25,000 per year for the period of the current analysis is between 50 per cent and 52 per cent, probably closer to 52 per cent because of the tendency for most corporations to end taxable years concurrent with the calendar year.

(\$25,000 \times .22).⁹ The surcharge, besides providing an apparently unintended subsidy to many middle-size and larger firms, also distorted the corporate arrangements of many firms, perhaps at the expense of a loss in efficiency.

Counting as special tax provisions all surtax exemptions and not just multiple surtax exemptions implies that a basic corporation income tax structure should have only one marginal tax rate. This position is consistent with the assumption that corporations are separate entities and subject to income taxation independently from their shareholders. The normative assumption is that each entity should be taxed proportionately. This can be defended on the basis of a benefit principle of taxation, assuming that benefits (e.g., police protection, national defense) accrue to corporations in proportion to their true accounting profits, or on the basis of an ability-to-pay principle, ability-to-pay being represented by true accounting profits, assuming constant marginal utility of income.

No special calculation is required for the reduction in tax liabilities resulting from the surtax exemption provision. The data base for reported accounting profits includes all profits eligible for the surtax exemption. The reported tax liabilities already exclude the tax savings that result from the surtax exemptions.

2. *Excess of Percentage Depletion Allowance over Cost Basis Depletion.* To take into account the exhaustion of a mineral deposit as it is extracted, the Internal Revenue Code provides for an allowance for depletion of the value of the deposit when the minerals are sold or used in subsequent manufacturing or refining processes. The important aspect of the current depletion law is its provision for depletion allowances in excess of investment cost. Each year the taxpayer is permitted to use the larger of two alternative methods for

⁹The savings increased with the passage of the Revenue Act of 1964. The new surcharge rate is 26 per cent; the saving per multiple surtax exemption is thus \$6,500. However, another provision of the Revenue Act of 1964 provided for a penalty tax on multiple incorporations. This reduced the tax benefits from multiple incorporation.

computing deductions for the depletion of the value of a mineral deposit. The first method is a *pro rata* fraction of the capitalized *costs of the property*. The second method involves a deduction which is the smaller of either (1) a statutory percentage of the *gross value of production* from the property (less rents and royalties) or (2) 50 per cent of net income before the depletion deduction. The first method ("cost depletion") limits deductions over the life of a producing property to no more than actual investment outlays. The second method ("percentage depletion") permits total deductions that exceed actual investment outlays.

Percentage depletion allowances in excess of cost depletion apply to almost all of the extractive industries.¹⁰ They have been justified on the grounds that unusual risks are involved in mineral exploration and development and that a subsidy is necessary to finance and encourage new discoveries and expansion in these industries. While this may be true, it is not clear why the returns to this risk cannot be captured through the market as they are in other industries. The initial argument for percentage depletion was expansion of industries strategic for national defense. This theme has been reactivated in recent years, especially by the oil industry.

The present objective is to compute for each IRS "minor industry" in mining and manufacturing the difference between the actual depletion deduction and a cost depletion deduction that would occur in the absence of the percentage depletion provision. The Office of Tax Analysis has made historical estimates of the impact of the percentage depletion allowance on total

¹⁰Depletion allowances in 1963 ranged from 27.5 per cent for oil and gas to 5 per cent for clam shells, timber, gravel, peat, sand, clay, stone, and clay and shale used or sold for use in the manufacture of sewer pipe or brick. In between, a 23 per cent rate was applied to sulfur, uranium, alumina, bauxite, chromite, graphite, antimony, cobalt, lead, manganese, mercury, nickel, platinum, tin, titanium, tungsten, zinc, and various other less common materials. Asphalt and china clay used for refractory purposes were allowed a 15 percentage point depletion while a 10 per cent rate applied to some types of asbestos, lignite, coal, and salt.

depletion deductions claimed.¹¹ It estimated the magnitude of cost depletion if the mineral properties held at the time had been depleted on the basis of (1) their cost of acquisition and (2) a units-of-production method of allocating allowances over the service life of a mineral deposit. Because of the way in which the Treasury ascertained the investment cost base in that study — the actual cost of these investments while the percentage depletion provision was in force — we can use their estimate of the percentage of allowable depletion which exceeds cost-basis depletion¹² as a minimum estimate of the profits of the mineral extraction industry which are hidden from the tax base.¹³ Fortunately, the Treasury study from which the excess percentage depletion allowances are derived used as a counterfactual the cost-basis depletion of mineral properties. The investment cost for those properties was valued at prices which already reflected any distortion in demand

¹¹U.S. Treasury Department (1950). This study found that for the years 1946 and 1947 sample firms (about 75 per cent of total depletion deductions) "had an average allowable depletion deduction of 24.3 per cent of gross income from production, 22.1 percentage points being excess over cost basis; for 1947, the percentages were, respectively, 25.1 and 23.6" (p. 328).

¹²The 1946-1947 average percentage allowable depletion which exceeded cost-basis depletion was, for example, 84.0 per cent for metal mining, 88.0 per cent for crude oil and natural gas, 98.4 per cent for nonmetallic mining, 93.2 per cent for integrated petroleum refiners, and 64.8 per cent for integrated iron and steel producers.

¹³Firms in the business of extracting minerals from the ground are not necessarily the sole beneficiaries of preferential treatment from the percentage depletion provision. Changes in factor or product prices may permit suppliers or consumers to share in the transfer of income. In addition, lessors of mineral properties may take percentage depletion allowances on the royalty income from their properties. Operating companies must deduct the royalties paid from gross income before determining their depletion deduction.

The benefits to lessors of mineral properties are of no concern to the present analysis. Suffice it to say that lessors may claim percentage depletion allowances on their royalty income and also may have their royalty income inflated if the depletion allowance permitted to operating companies effectively lowers costs and results in an increased demand for mineral-producing properties.

that may have been caused by the existence of the percentage depletion provision. Thus, the gain to property owners from inflated rents on mineral producing properties is included in the Treasury's estimates of *cost-basis* depletion.

The estimate of underreported profits caused by the percentage depletion provision is given by

$$DEPL_i = \alpha_i \beta_i D_i$$

where

DEPL = underreported profits arising from the percentage depletion provision

α = the fraction of percentage depletion allowances which are excess over cost-basis depletion

β = the fraction of total depletion allowances computed using the percentage depletion method

D = total depletion allowance (percentage plus cost-basis) deduction for 1963

i = industry

Treasury estimates of excess depletion resulting from the percentage depletion allowance provide the fraction (α) of percentage depletion allowances that would result from cost-basis depletion of the same investments. Since the law still permits cost depletion, this fraction is applied only to depletion allowances that are computed using the percentage method. While this consideration is not too important quantitatively, the proportion of properties depleted using the units-of-production cost method does vary quite a bit across industries. A Treasury study (1960) reported the percentage of total corporate depletion allowance deductions which were computed using cost depletion and percentage depletion. Using these data it is possible to separate the total amount of depletion deductions reported for each IRS "minor industry" into those based on percentage and those based on cost depletion. The variable β is derived from these data.

Several potential biases in this estimate of underreported profits complicate the analysis. These include (1) the possibility that some of the advantage from the special

tax treatment is transferred to consumers through concessions (the possibility of some advantage being transferred to owners of factors has already been discussed), (2) the effect that depletion allowances may have on costs, and (3) the more serious matter that the depletion allowance creates behavioral incentives to increase output which in turn will affect the size of the depletion allowance. Each of these problems is discussed in greater detail in Siegfried (1972, pp. 103-107).

3. *Expensing of Advertising Expenditures.* The practice of treating long-lived advertising as a current expense may, under certain conditions, lead to the understatement of reported taxable profits, since immediate write-off of these expenditures contributes to minimizing Federal (as well as state and local) income tax liabilities.

Leonard Weiss (1969) has demonstrated that three factors determine the magnitude of the gains to firms from the immediate advertising write-off provision: (1) the level of advertising, (2) the rate of growth of advertising expenditures, and (3) the annual rate of depreciation of advertising. If this is the case, and if advertising expenditures are growing at differential rates in different industries, then we can expect the gains to firms to vary substantially from industry to industry.

The Treasury does not compute a tax-expenditure item for the advertising expensing provision. It does, however, estimate the tax-expenditure generated by the tax provision which permits expensing of research and development expenditures in the year when they are incurred. Thus the Treasury recognizes that benefits from research and development expenditures generally accrue for well over one year. Most observers of the decay of advertising effectiveness find a similar time pattern for benefits from advertising.¹⁴ All the evidence (except one study of the automobile industry) points to an economic life of advertising well beyond the year in which the advertising expenditures are incurred.

Consistency with the Treasury's treatment of research and development expendi-

tures requires treating the immediate write-off for advertising expenditures as a special tax provision also. The procedure used to estimate the understatement in true accounting profits resulting from this write-off is based on Weiss's study. It is given by the equation:

$$ADSE_i = A_{it} - (1 - \lambda) \sum_{j=0}^t (\lambda^j A_{i,t-j}) - \lambda^5 A_{i,t-5}$$

where

ADSE = underreported profits arising from the advertising expensing provision.

A_t = investment in advertising in year t

λ = the ratio between year-end net value of an intangible investment and its value at the start of the year. The annual depreciation rate is therefore $(1 - \lambda)$.

i = industry

The computed effective average tax rates apply to 1963 only, and consequently several adjustments to the corporation income tax data provided in the *Source Book of Statistics of Income* for taxable years ending July 1, 1963, through June 30, 1964, are required. These adjustments include the removal of carryforward tax loss credits claimed in 1963 which originated in earlier years, and an estimate of the 1963 net deficits that were carried back to 1960, 1961, and 1962, or forward to years later than 1963.

The sample data consist of the corporation income tax returns for all corporations in mining and manufacturing for 1963. These include both firms with and without net income. Firms without net income should be included in the sample even though they can be expected to pay zero taxes and simultaneously reduce their industry's aggregate net income. This appears to bias the effective average tax rates upward. However, excluding firms without net positive income would, if the calculations were repeated over subsequent years, sys-

¹⁴A survey of this literature is available in Weiss (1969), pp. 423-424.

tematically understate effective average tax rates over a longer period. In years when firms incurred losses they would not be included in the sample. In prior or subsequent years, if the same firms reported a net positive profit, they would contribute to total industry profits but pay fewer taxes than would be expected on the basis of their net profits because the losses from 1963 could be carried back three years or forward five years as deductions from positive net income. Another reason for retaining firms without net income in the sample is that some secondary data sources used to estimate the quantitative impact of several of the special tax provisions did not provide a breakdown between firms with and without net income. Finally, the Treasury does not consider the rule requiring the government to share in losses (carryforward and carryback loss rule) as well as in profits to be a special provision. It apparently concludes that a loss-sharing provision is part of a basic income tax structure. This study adheres to that conclusion.

III. *Estimated Effective Average Tax Rates*

Effective average corporation income tax rates based on estimated true accounting profits are presented in Table 1. Because some of the adjustments for underreported profits are based on controversial assumptions, a set of six effective corporation income tax rates is produced and reported.

Reporting the tax rates at various stages of partial adjustment of the data allows the reader the option of choosing that effective tax rate which he considers to be most meaningful. In addition, the various tax rates permit an evaluation of the relative impact of particular adjustments on the tax rates. The tax rates are defined using the following symbols:

t = 1963 effective average corporation income tax rate

Y = reported total receipts less deductions (excluding income of controlled foreign corporations but including dividends received from foreign corporations)

TL = 1963 reported actual income tax liability before investment and foreign tax credits

T_d = estimated reduction in tax liabilities of other years (than 1963) from the carryback and carryforward of 1963 deficits

T_c = estimated reduction in 1963 tax liabilities from carryforward of pre-1963 deficits

T_{15} = estimated tax liability on the 15 per cent of domestic dividends received which were taxable in 1963

$DIVREC$ = reported total domestic dividends received in 1963

$DEPL$ = estimated underreported profits arising from excess percentage over cost-basis depletion

$EXDD$ = estimated underreported profits arising from the expensing provision for exploration, development, and dry hole costs

$DEPR40$ = estimated underreported profits arising from the use of accelerated depreciation methods and too-short service lives for tangible assets; building life = forty years

$ADSE$ = estimated underreported profits arising from the advertising expensing provision, using exponential, six-year depreciation as the counterfactual

RD = estimated underreported profits arising from the research and development cost expensing provision; using straight-line, five-year depreciation as the counterfactual

SL = estimated underreported profits arising from the income tax exemption of interest earnings from state and local securities

$INVCRE$ = 1963 reported investment credit allowance

FTC = 1963 reported foreign tax credit

T = tax liabilities

P = "profits"

i = index to distinguish various definitions of T, P, and t.

The six tax rates reported in Table 1 are defined by the following formulae:

$$t_1 = \frac{T_1}{P_1} = \frac{TL}{Y}$$

$$t_2 = \frac{T_2}{P_2} = \frac{T_1 - T_d + T_c}{Y}$$

$$t_3 = \frac{T_3}{P_3} = \frac{T_2 - T_{15}}{Y - \text{DIVREC}}$$

$$t_4 = \frac{T_4}{P_4} = T_3 / (P_3 + \text{DEPL} + \text{EXDD} + \text{DEPR40} + \text{ADSE} + \text{RD} + \text{SL})$$

$$t_5 = \frac{T_5}{P_5} = \frac{T_4 - \text{INVCRE}}{P_4}$$

$$t_6 = \frac{T_6}{P_6} = \frac{T_5 - \text{FTC}}{P_4}$$

Tax rate t_1 is the ratio of the actual reported 1963 income tax liability (before credits) to reported total receipts less deductions.¹⁵ This effective average corporation income tax rate varies across industries principally because of variations in the ratio of deficits to positive profits. Firms incurring deficits reduce accounting profits in an industry, but no corresponding reduction appears in tax liabilities since the government shares in losses by permitting firms to reduce their positive taxes in *other* years rather than sending them a direct negative tax payment. Tax rate t_1 can also vary across industries as a result of different proportions of net taxable income being subject to the over-\$25,000 surtax or the long-term

¹⁵It would be incorrect to label this tax rate the "actual effective tax rate" since in reality tax credits serve to make the rate actually paid for 1963 less than t_1 . In addition, the effects of some of the special tax provisions are contained in t_1 (e.g., the \$25,000 surtax exemption, special capital gains tax rate) while the effects of others are not (e.g., excess depletion, expensing of advertising expenditures). Thus there is no convenient label that can be used to describe the meaning of t_1 .

capital gains tax rate of 25 per cent. Additional variations in t_1 are created by net operating loss carryforwards into 1963, the deduction for domestic dividends received, and the Western Hemisphere Trade Corporation deduction.

Tax rate t_2 reflects income tax liabilities on *net* 1963 income. First, the tax deduction due to prior years' deficits carried into 1963 is added back to tax liabilities. Then the reduction in prior and future years' tax liabilities arising from 1963 deficits carried to those years is estimated and subtracted from the 1963 tax liability figure—a reduction from 1963 reported tax liabilities.

Tax rate t_3 reflects the elimination of the tax on 15 per cent of dividends received from domestic subsidiaries of corporations. Under 1963 statutes, corporations could deduct 85 per cent of such dividends before computing tax liabilities. Tax liabilities are adjusted to remove the tax on the remaining 15 per cent of dividends received from domestic subsidiaries. Profits are reduced by the full 100 per cent of domestic dividends received because this income has already been counted at its source, and it was decided earlier in this study that it would not constitute part of a comprehensive tax base.

To derive tax rate t_4 , "underreported" profits are added to reported profits. "Underreported" profits are those arising from excess percentage over cost depletion, expensing of development, exploration and dry hole costs, excess depreciation, advertising cost expensing, research and development cost expensing, and tax-exempt interest income. Variations in these special tax provisions across industries cause a large change in the correlation of effective average tax rates t_3 and t_4 .

Tax rate t_5 reflects deletion of the investment tax credit from tax liabilities. Tax rate t_6 eliminates the other principal tax credit item, the foreign tax credit, from tax liabilities.¹⁶

Before comparing the effective average U.S. corporation income tax rates t_1 through t_6 , it is necessary to delete several specific industries from the sample. Corporations

¹⁶See note 6 for an appraisal of the foreign tax credit as a special tax provision.

TABLE 1

NET INCOME, INCOME TAX (BEFORE CREDITS), AND EFFECTIVE CORPORATION
INCOME TAX RATES BY IRS "MINOR INDUSTRY" FOR 1963
(MILLIONS OF DOLLARS AND PERCENTAGE POINTS)

IRS Code	Industry Description	Net Income (\$ x 10 ⁶)	Income Tax (\$ x 10 ⁶)	t ₁	t ₂	t ₃	t ₄	t ₅	t ₆
1010	Iron Ores	32.64	44.94	137.7	7.7	7.6	1.8	-0	-26.4
1020	Copper, Lead, Zinc, Gold, Silver Ores	178.69	75.84	42.4	44.4	47.3	32.8	31.1	20.6
1098	Misc. Metal Mining	-6.72	3.03	-45.1	63.3	62.6	-20.9	-21.1	-23.3
1100	Coal Mining	65.63	34.77	53.0	35.1	41.5	22.6	18.2	18.2
1310	Crude Petroleum, Natural Gas & Liquids	728.94	383.82	52.7	50.5	51.4	24.3	24.1	2.4
1380	Oil & Gas Field Services	79.24	44.62	56.3	47.0	47.4	60.5	54.4	44.3
1410	Stone & Gravel	105.99	48.34	45.6	44.8	45.3	27.7	24.4	24.4
1498	Misc. Nonmetallic Minerals, Ex. Fuels	28.24	24.76	87.7	49.4	51.5	18.9	16.2	13.2
2010	Meat Products	170.44	82.44	48.4	43.8	44.2	34.2	31.8	31.2
2020	Dairy Products	300.10	157.35	52.4	47.3	47.9	43.0	40.0	37.7
2030	Canned & Frozen Foods	253.23	134.13	53.0	49.9	50.1	47.8	45.7	43.1
2040	Grain Mill Products	362.11	177.68	49.1	48.9	49.1	42.8	41.2	36.2
2050	Bakery Products	168.01	91.62	54.5	49.8	50.1	45.8	43.2	43.1
2060	Sugar	181.35	89.00	49.1	48.4	49.7	47.7	45.4	43.6
2070	Confectionery Products	141.71	72.77	51.4	50.6	50.7	47.1	46.2	44.8
2082	Malt Liquors & Malt	191.77	97.94	51.1	50.8	51.2	45.6	42.8	42.8
2084	Wines, Brandy, Brandy Spirits	15.47	8.06	52.1	50.2	50.3	42.2	40.9	40.9
2085	Distilled Liquors	131.81	64.37	48.8	51.0	51.3	46.9	45.2	45.2
2086	Bottled Soft Drinks & Flavoring	272.13	130.79	48.1	46.9	48.0	38.6	37.1	30.5
2091	Vegetable and Animal Oils	45.10	24.45	54.2	42.7	45.0	29.7	26.5	26.4
2098	Food & Kindred Products, N.E.C.	175.35	91.74	52.3	49.2	49.5	37.5	36.4	34.6
2099	Food & Kindred Products, N.A.	175.84	90.10	51.2	51.2	51.2	49.5	47.9	46.5
2100	Tobacco Manufactures	647.61	335.05	51.7	51.7	51.8	48.5	47.9	47.6
2211	Broad Woven Fabric Mills, Cotton	156.56	84.69	54.1	49.7	50.1	46.4	43.1	42.8
2212	Broad Woven Fabric Mills, Man-Made Fibers	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2213	Narrow Woven Fabric Mills, Cotton	167.73	88.41	54.1	49.7	50.1	46.4	43.1	42.8
2214	Narrow Woven Fabric Mills, Man-Made Fibers	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2215	Woolen and Worsted Spinning	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2216	Woolen and Worsted Weaving	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2217	Woolen and Worsted Finishing	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2218	Knit Goods Manufacturing	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2219	Textile Mill Products, N.E.C.	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2220	Textile Mill Products, N.A.	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2221	Wool Spinning	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2222	Wool Weaving	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2223	Wool Finishing	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2224	Woolen and Worsted Spinning	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2225	Woolen and Worsted Weaving	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2226	Woolen and Worsted Finishing	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2227	Knit Goods Manufacturing	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2228	Textile Mill Products, N.E.C.	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2229	Textile Mill Products, N.A.	100.95	52.21	51.7	51.0	51.2	49.0	47.0	46.4
2230	Men's & Boy's Clothing	166.97	82.80	49.6	48.1	48.5	46.8	45.7	44.6
2231	Women's, Children's Infant's Clothing	140.40	73.77	52.5	41.2	41.6	42.7	41.5	40.9
2232	Men's & Boy's Footwear	166.97	82.80	49.6	48.1	48.5	46.8	45.7	44.6
2233	Women's, Children's Infant's Footwear	140.40	73.77	52.5	41.2	41.6	42.7	41.5	40.9
2234	Men's & Boy's Accessories	166.97	82.80	49.6	48.1	48.5	46.8	45.7	44.6
2235	Women's, Children's Infant's Accessories	140.40	73.77	52.5	41.2	41.6	42.7	41.5	40.9
2236	Men's & Boy's Hats	166.97	82.80	49.6	48.1	48.5	46.8	45.7	44.6
2237	Women's, Children's Infant's Hats	140.40	73.77	52.5	41.2	41.6	42.7	41.5	40.9
2238	Misc. Apparel & Accessories	27.08	15.39	56.8	44.2	44.5	41.4	40.5	40.3
2239	Misc. Fabricated Textile Products	34.86	17.35	49.8	40.2	40.6	40.9	39.1	38.5
2239	Apparel & Fabricated Textile Prod., N.A.	5.48	2.88	52.5	52.1	52.1	58.5	56.2	55.8
2410	Logging, Lumber & Basic Wood Prod.	199.05	62.98	31.6	29.5	29.8	35.2	31.0	30.9
2430	Millwork, Veneers, Plywood, Prefab.	125.05	50.04	40.0	37.8	38.0	37.5	34.8	34.7
2498	Misc. Wood Products, Ex. Furniture	40.16	15.50	38.6	34.1	34.5	34.9	32.7	32.6
2510	Household Furniture	165.22	84.13	50.9	46.2	47.1	46.2	44.7	44.6
2590	Furniture & Fixtures, Ex. Household	72.60	41.57	57.3	44.9	45.3	42.8	41.1	40.9
2611	Pulp Mills	36.95	17.99	48.7	49.4	49.6	51.0	47.9	41.8
2614	Paper, Paperboard, Bldg. Materials	534.68	242.73	45.4	46.2	46.9	44.4	40.3	37.6
2640	Converted Paper & Paperboard Prods.	244.42	132.99	54.4	50.0	50.2	49.0	47.4	44.5
2650	Paper Boxes & Containers	105.33	58.72	55.7	47.4	47.9	45.0	41.6	41.1
2711	Newspapers	458.56	216.99	47.3	47.7	49.7	49.4	48.1	47.3
2712	Periodicals	89.53	54.98	61.4	48.2	50.2	40.3	39.1	36.5
2715	Book Publishing	168.28	84.66	50.3	47.8	49.1	43.8	42.9	42.4
2720	Business Form Printing	259.18	135.81	52.4	46.6	47.0	45.4	41.9	40.9
2780	Bookbinding	55.93	28.00	50.1	42.8	44.7	45.9	43.1	42.3
2799	Printing, Publishing, N.A.	2.79	1.26	45.1	40.2	40.4	79.4	77.1	77.1
2811	Basic Chemicals	435.08	225.15	51.7	50.4	51.1	41.6	38.7	34.8
2812	Plastic Materials & Synthetics	1074.36	497.51	46.3	44.7	51.7	44.2	41.7	39.9

IRS Code	Industry Description	Net Income	Income Tax	t ₁	t ₂	t ₃	t ₄	t ₅	t ₆
2830	Drugs	726.28	365.96	50.4	49.9	50.5	44.0	43.4	39.6
2841	Soap	305.81	152.28	49.8	48.7	50.3	38.2	37.5	32.1
2842	Toiletries	169.61	90.61	53.2	51.1	51.3	45.5	45.0	41.0
2850	Paints, Gum & Wood Chemicals	190.42	96.71	50.8	49.1	50.9	44.8	43.9	41.7
2870	Agricultural Chemicals	50.69	27.59	54.4	39.7	40.4	27.7	24.8	24.8
2898	Misc. Chemical Products	290.39	142.05	48.9	48.4	49.2	42.6	40.4	37.5
2899	Chemical Products, N.A.	603.47	301.61	50.0	50.0	51.1	50.5	47.7	44.0
2911	Petroleum Refin. Without Extraction	46.05	20.18	43.8	49.3	54.5	26.8	25.0	22.5
2912	Petroleum Refining With Extraction	2548.22	927.91	36.4	36.6	46.8	20.9	19.8	3.3
2998	Misc. Petroleum & Coal Products	65.43	30.27	46.3	46.6	46.8	37.0	34.6	34.2
3010	Tires & Tubes	340.98	170.60	50.0	50.6	51.5	46.1	42.9	35.3
3020	Rubber Products, Ex. Tires & Tubes	113.12	54.11	47.8	47.9	48.8	44.9	42.7	42.3
3098	Misc. Plastic Products	66.99	49.05	73.2	45.1	45.6	32.0	28.3	28.1
3140	Footwear, Ex. Rubber	103.51	54.61	52.8	48.5	49.8	44.1	42.4	42.3
3198	Leather Tanning & Finishing	47.90	23.18	48.4	37.1	37.5	33.8	32.5	32.4
3210	Glass & Glass Products	317.61	158.89	50.0	48.7	50.6	47.1	45.1	44.0
3240	Cement	139.41	74.34	53.3	51.0	51.5	38.8	33.8	33.4
3250	Structural Clay Products	70.07	36.09	51.5	47.6	48.4	42.1	39.9	35.4
3260	Pottery	19.13	9.60	50.2	48.6	48.9	48.2	46.6	44.7
3270	Concrete, Gypsum, Plaster	235.06	117.19	49.9	46.5	46.7	36.0	33.2	32.4
3298	Misc. Nonmetallic Mineral Prod.	179.12	88.24	49.3	49.4	50.0	44.0	41.6	35.4
3310	Blast Furnaces, Steel Works, Etc.	1355.01	685.48	50.6	50.0	51.0	45.7	42.1	41.4
3330	Nonferrous Primary Metals	372.87	101.35	27.2	22.5	22.8	23.9	21.5	5.2
3398	Misc. Primary Metals	41.85	22.74	54.3	45.4	45.8	39.2	37.0	31.3
3399	Primary Metals, N.A.	4.95	2.22	44.8	46.5	46.5	46.8	43.9	43.2
3410	Metal Cans	102.00	50.96	50.0	50.2	50.2	39.2	36.7	35.7
3420	Cutlery & Hand Tools	200.96	98.51	49.0	48.9	49.4	45.6	44.5	39.7
3430	Heating & Plumbing Apparatus	137.29	70.91	51.6	49.5	49.6	46.8	45.6	39.7
3440	Fabricated Structural Metal Prod.	195.87	111.67	57.0	45.8	46.3	41.3	39.2	38.2
3450	Screw Machine Products	107.99	44.57	41.3	44.2	44.4	42.9	40.7	40.5
3461	Metal Stampings	112.43	54.41	48.4	47.0	47.1	42.0	39.6	38.0
3462	Metal Coating & Engraving	30.23	13.75	45.5	40.6	40.9	35.3	32.6	32.6
3498	Wire & Metal Products, N.E.C.	257.71	136.01	52.8	47.0	47.3	42.9	40.9	40.7
3499	Fabricated Metal Products, N.A.	10.59	4.69	44.2	43.2	43.7	40.2	38.4	34.9
3510	Engines & Turbines	75.57	40.90	54.1	50.9	51.3	39.3	38.1	37.9
3520	Farm Machinery	193.15	92.12	47.7	48.9	50.5	41.1	39.3	34.1
3530	Constr., Mining, Mat. Handling Equip.	482.97	243.85	50.5	49.9	51.0	47.4	46.4	44.1
3540	Metalworking Machinery	287.54	140.65	48.9	47.2	47.5	46.2	44.2	42.9
3550	Special Industry Machinery	210.09	106.11	50.5	46.3	47.1	40.7	39.2	35.3
3560	General Industry Machinery	329.23	170.97	51.9	49.9	50.2	48.4	47.1	45.1
3570	Office & Computing Machinery	665.90	345.99	52.0	51.5	51.7	40.2	39.3	38.6
3580	Service Industry Machinery	77.75	55.76	71.7	49.6	50.1	43.3	41.6	40.7
3598	Misc. Machinery, Ex. Electrical	83.45	46.66	55.9	42.1	42.2	36.6	33.7	33.6
3599	Machinery, Ex. Electrical, N.A.	18.86	10.24	54.3	44.6	49.6	57.3	54.1	52.0
3611	Elec. Transmission & Distrib. Equip.	583.78	306.50	52.5	51.6	51.6	47.7	46.4	45.3
3612	Electrical Industry Apparatus	107.38	59.71	55.6	51.2	51.3	46.9	45.4	45.0
3630	Household Appliances	238.22	124.98	52.5	51.5	51.7	44.3	43.4	35.9
3650	Radio & TV Receivers	174.77	99.53	56.9	51.3	51.7	44.0	42.5	40.9
3661	Communication Equip.	133.12	70.70	53.1	51.9	52.0	37.0	35.9	27.9
3662	Electronic Components	121.15	93.15	76.9	50.2	50.5	25.5	23.8	22.6
3691	Lighting & Wiring Equip.	85.54	44.16	51.6	49.2	49.4	45.2	44.0	43.6
3698	Electrical Machinery, N.E.C.	104.19	49.98	48.0	49.7	49.9	47.7	46.6	43.3
3699	Electrical Machinery, N.A.	63.91	31.57	49.4	49.7	50.8	50.5	46.3	42.1
3711	Motor Vehicles & Parts	4931.07	2540.25	51.5	51.4	51.8	44.2	43.4	41.4
3721	Aircraft, Complete Missiles	465.55	237.33	51.0	50.7	50.9	46.4	43.9	43.4
3722	Aircraft & Missile Parts & Subassemblies	228.82	121.94	53.3	50.2	50.6	48.1	44.9	44.3
3730	Ship & Boat Building & Repair	19.86	16.75	84.3	56.3	57.8	44.0	42.2	42.2
3791	Railroad Equipment	92.79	45.93	49.5	49.4	50.7	49.2	45.9	42.9
3798	Transportation Equip., N.E.C.	50.47	26.28	52.1	50.3	50.7	43.0	42.3	42.2
3810	Scientific & Mechanical Measuring Inst.	234.68	123.05	52.4	50.3	50.4	42.2	40.4	39.3
3830	Optical, Medical & Ophthalmic Goods	128.19	62.58	48.8	47.6	48.2	37.3	35.9	33.0
3860	Photographic Equip. & Supplies	349.56	188.88	54.0	51.9	52.0	44.0	42.7	41.5
3870	Watches & Clocks	25.98	11.89	45.8	51.4	51.4	40.0	39.1	38.1
3910	Jewelry & Silverware	39.32	18.31	46.6	45.3	45.7	44.4	43.6	43.6
3920	Toys & Sporting Goods	71.81	52.30	72.8	49.8	50.3	41.5	40.2	39.9
3930	Ordnance, Ex. Missiles	20.18	11.83	58.6	43.7	44.3	41.3	40.2	39.8
3991	Costume Jewelry	1.82	3.36	184.6	87.5	87.5	62.6	62.1	62.1
3998	Other Manufacturing	212.94	113.22	53.2	48.0	48.5	44.8	43.5	41.6
3999	Manufacturing, N.A.	14.37	9.26	64.4	51.1	51.4	266.5	258.3	251.9

Source: Columns 3-4 from Source Book of Statistics of Income, 1963-64, Internal Revenue Service, U.S. Department of Treasury, Washington, D.C.

Columns 5-10 derived using methods and data described in text.

whose activities are considered too varied to be assigned specific IRS "minor industry" codes are assigned instead "not allocable" codes in the appropriate two-digit major group or industry division. In general, these industries are small relative to the other "minor industries" in the sample. Consequently their tax rates are particularly sensitive to shifts in their component firms, which occur frequently. The computed effective tax rates are sensitive to other years' activities because of the adjustments for deficits, loss carryforwards, and advertising expensing; so the non-comparability between years is important. Therefore not allocable industries are eliminated from the sample.

Four other IRS "minor industries" are omitted from the comparison. Miscellaneous Metal Mining is eliminated because it realized an aggregate net deficit for 1963. Costume Jewelry, and Oil and Gas Field Services are eliminated from the sample because they realized an effective average tax rate greater than 52 per cent, which indicates an error in the computation of underreported profits. Costume Jewelry is the smallest IRS "minor industry" in mining and manufacturing and consequently its effective average tax rate is very sensitive to shifts of firms into and out of it or small (in absolute terms) errors in computing the value of underreported profits. The source of the paradox for Oil and Gas Field Services is not obvious, but it may be rooted in an erroneous estimate of the underreported profits arising from excess depreciation allowances. Iron Ores is eliminated because it showed a meaningless negative effective average tax rate. With the elimination of the ten "not allocable" industries and these four additional industries, the remaining sample is comprised of 110 IRS "minor industries."

The simple means of the effective average corporation income tax rates t_1 through t_6 for the truncated sample are reported in Table 2. Because the tax rates in Table 2 are simple means, they do *not* represent the single tax rate which, if applied uniformly to a comprehensive tax base, would yield the same total tax revenue as the actual 1963 tax structure. To estimate such a tax rate the relative magnitude of the different indus-

TABLE 2
1963 EFFECTIVE AVERAGE CORPORATION
INCOME TAX RATE MEANS AND
STANDARD DEVIATIONS

Tax Rate	Simple Mean ^a (percentage)	Standard Deviation (percentage)
t_1	51.98	8.24
t_2	47.18	4.82
t_3	48.05	4.66
t_4	41.43	6.63
t_5	39.40	6.82
t_6	37.19	8.50

^aArithmetic mean of 110 IRS "minor industries," each weighted equally.

Source: Table 1.

tries must be taken into consideration. When this is done, the single uniform tax rates that would raise the actual 1963 tax revenue under assumptions corresponding to t_4 , t_5 , and t_6 are 31.2 per cent, 29.9 per cent, and 26.1 per cent respectively. That is, if the comprehensive tax base included all of the profits currently excluded from taxation as a result of the special provisions considered in this study, and if the investment tax credit and the foreign tax credit were abandoned, a single proportional tax rate of 28.3 per cent would be sufficient to maintain tax revenue levels.

The simple correlation coefficients between the unweighted tax rates appear in Table 3. It appears that the adjustment with the greatest impact on the tax rates is the correction for underreported profits. This adjustment tends to reduce the mean and

TABLE 3
SIMPLE CORRELATION COEFFICIENTS
BETWEEN 1963 EFFECTIVE AVERAGE
CORPORATION INCOME TAX RATES

	t_1	t_2	t_3	t_4	t_5	t_6
t_1	1.000					
t_2	.474	1.000				
t_3	.453	.957	1.000			
t_4	-.023	.512	.409	1.000		
t_5	-.023	.540	.438	.989	1.000	
t_6	.085	.485	.370	.933	.923	1.000

increase the dispersion. The relatively low correlation between t_3 and t_4 , .409, indicates that the reductions in effective tax rates are not realized uniformly across industries. There is virtually no correlation of effective tax rates t_4 , t_5 and t_6 with tax rate t_1 , the effective tax rate computed using reported accounting profits as the income measure and actual annual tax liabilities before credits as the tax measure. This suggests that the easily calculated ratio, t_1 , is an unsatisfactory proxy for the concept of effective corporation income tax rates adopted here.

Table 4 lists those industries whose 1963 effective average U.S. corporation income tax rate (t_5) is more than one standard deviation from the mean effective tax rate for all 110 industries. Most of the industries at the lower tail of the distribution are

striking aspect of the distribution is the low tax rates of Crude petroleum, Natural gas & liquids, and Petroleum refining with extraction. These two industries together earned \$3.3 billion in reported receipts less deductions for 1963. Only Motor vehicles and parts earned more (\$4.9 billion) and only two other industries earned more than \$1.0 billion (Blast furnaces, steel works, etc. earned \$1.4 billion and Plastic materials and synthetics earned \$1.1 billion). Industries at the upper tail of the distribution do not appear to share any common characteristic.

IV. Summary and Conclusion

This paper estimates effective average corporation income taxes for IRS "minor

TABLE 4
1963 EFFECTIVE AVERAGE CORPORATION INCOME TAX RATES (t_5)
FOR INDUSTRIES WITH RATES MORE THAN ONE STANDARD
DEVIATION FROM THE ALL-INDUSTRY MEAN
(Mean = 39.40, Standard Deviation = 6.82)

IRS "minor industry" code	Industry Description	Tax Rate (t_5) (Percentage)
1498	Miscellaneous Nonmetallic Minerals	16.2
1100	Coal Mining	18.2
2912	Petroleum Refining with Extraction	19.8
3330	Nonferrous Primary Metals	21.5
3662	Electronic Components	23.8
1310	Crude Petroleum, Natural Gas & Liquids	24.1
1410	Stone and Gravel	24.4
2870	Agricultural Chemicals	24.8
2911	Petroleum Refining Without Extraction	25.0
2091	Vegetable and Animal Oils	26.5
3098	Misc. Plastic Products	28.3
2410	Logging, Lumber and Basic Wood Products	31.0
1020	Copper, Lead, Zinc, Gold, Silver Ores	31.1
2010	Meat Products	31.8
3198	Leather Tanning and Finishing	32.5
2070	Confectionary Products	46.2
3530	Constr., Mining, Mat. Handling Machinery	46.4
3611	Electrical Transmission & Distribution Equipment	46.4
3260	Pottery	46.6
3698	Electrical Machinery, N. E. C.	46.6
2212	Broad Woven Fabric Mills, Man-Made Fibers	47.0
3560	General Industry Machinery	47.1
2640	Converted Paper and Paperboard Prods.	47.4
2100	Tobacco Manufactures	47.9
2611	Pulp Mills	47.9
2711	Newspapers	48.1

Source: Tables 1 and 2.

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industries" in mining and manufacturing for the 1963 tax year. The simple average of these tax rates, considering the foreign tax credit provision to be part of the basic income tax structure (t_n), is 39 per cent. The gap between 39 per cent and 52 per cent provides some indication of the pervasiveness of special tax provisions and allowances. The standard deviation around the effective average tax rate, about 7 percentage points, indicates that special tax treatment does not have a uniform relative impact on all industries.

Effective average corporation income tax rates by industry may have several useful applications. For example, the correlations between the effective tax rates suggest that some difference may exist among industries in their ability or desire to influence tax policy. This hypothesis has been investigated in another study (Siegfried, 1972) employing a model which included the logical environmental factors which may affect the behavior of American firms in the political arena. Hypotheses were explored concerning the association of firm size, market concentration, industry size, geographical dispersion of an industry's employment, and its profit rate with the effect of political influence. Low effective average corporation income tax rates were used as an index of successful political influence. Elasticities of the effective average corporation income tax rate were computed with respect to the structural variables for a variety of plausible economic-political-behavior models. Analyses of this type may be useful for bringing some hard, albeit partial, evidence to bear on the issue of the social and political implications of firm size.

A second important application of the effective average corporation income tax rates compiled in this study is in the analysis of "tax subsidies." This concept has received considerable attention recently in government and academic circles. Indeed, the Joint Economic Committee recently held hearings on this issue and published a compendium of papers (U.S. Congress, 1972) on the economics of federal subsidy programs. Most of the analysis to date has focused on the amount of tax subsidies arising from specific tax provisions rather than on the distribution of their impact across

industries. If one considers each of the special tax provisions as a subsidy to those eligible taxpayers who avail themselves of the opportunity to reduce their taxes, then one can compute the dollar value of total subsidies granted to specific industries by combining the direct subsidies that appear in the federal budget with these indirect subsidies that do not. These indirect subsidies amount to the value of true accounting profits times the difference between the average tax rate and 52 per cent.

A third potentially useful application for the effective average tax rates is suggested by the imaginative analysis of Arnold Harberger (1959). Harberger attempted to assess the extent to which the corporation income tax distorts the structure of the American economy through its biases against the corporate form of organization and against equity capital vis-a-vis borrowed capital. His method of analysis utilized a ratio of corporation income taxes to the total returns to capital, regardless of their nature or source. Variations in this ratio across sectors were interpreted as distortions in the decision-making environment confronting consumers and production managers. These distortions cause a welfare loss in the economy. Harberger was reasonably successful in providing a crude estimate of the magnitude of this welfare loss for the 1953-55 period.

The effective corporation income tax rates computed in the present paper could provide several improvements in the type of analysis suggested by Harberger. Empirically, estimates of effective tax rates by narrower industries than those categories adopted by Harberger would be useful. Some of the necessary assumptions in the analysis (e.g., unitary elasticity of substitution between capital and labor) are more acceptable when used with market definitions that are closer to economically meaningful markets. Conceptually, the variation in tax treatment among industries resulting from special tax provisions contributes as much to distortions confronting consumers as does the discriminatory treatment applied to the corporate form of organization. The mean effective average tax rates reported in Table 2 suggest that this consideration may be empirically important.

A fourth possible application of the tax rates goes beyond the field of economics. The effective average corporation income tax rates reported in this study may prove to be a useful data base for students of pressure group politics. Combined with similar indexes of the success of interest group actions on other public policies (e.g., effective rates of protection from international competition, or relative benefits from procurement activities), the effective tax rates may provide a point of departure for systematic analysis of this important area of interaction between business and government. This area holds vast implications for the future prosperity of the union between American capitalism and democracy.

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