NBER WORKING PAPER SERIES

THE EFFECTIVE TAX RATE AND THE PRETAX RATE OF RETURN

Martin Feldstein

James Poterba

Louis Dicks-Mireaux

Working Paper No. 740

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge MA 02138

August 1981

The research reported here is part of the NBER's research program in Taxation and project in Capital Formation. Any opinions expressed are those of the authors and not those of the National Bureau of Economic Research.

NBER Working Paper #740
September 1981

The Effective Tax Rate and the Pretax Rate of Return

ABSTRACT

This paper presents new estimates of the taxes paid on nonfinancial corporate capital, on the pretax rate of return to capital, and on the effective tax rate. The basic time series show that both the pretax rate of return and the effective tax rate have varied substantially in the past quarter century.

An explicit analysis indicates that, after adjusting for different aspects of the business cycle, pretax profitability was between one and 1.5 percentage points lower in the 1970's than in the 1960's. The rate of profitability in the 1960's was also about one-half of a percentage point greater than the profitability in the 7 years of the 1950's after the Korean war.

Changes in productivity growth, in inflation, in relative unit labor costs, and in other variables are all associated with changes in profitability. None of these variables, however, can explain the differences in profitability between the 1950's, 1960's and 1970's.

Looking at broad decade averages, the effective tax rate and the pretax rate of return move in opposite directions, higher pretax profits occurring when the tax rate is high. There thus appears to have been no tendency for pretax profits to vary in a way that offsets differences in effective tax rates.

Martin Feldstein
James Poterba
Louis Dicks-Mireaux
National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, Massachusetts 02138

(617) 868-3905

Section 4 then examines whether there has been a trend in profitability in the postwar period or a tendency for profits to decline in the 1970's. Several factors that are potential determinants of corporate profitability, including productivity and the ratio of final product prices to intermediate input prices and unit labor costs, are then examined in section 5. There is no evidence that the broad fluctuations in the effective tax rate over the past 25 years induced offsetting changes in the pretax rate of return. Changes in the effective tax rate were therefore associated with correspondingly large changes in the net rate of return.

1. State and Local Taxes Paid by Nonfinancial Corporations

In measuring corporate profits, the national income and product accounts treat state and local property taxes very differently from the profits taxes levied by all levels of government.[1] Pretax profits are defined as profits before corporate income taxes but after all of the state and local property taxes paid by corporations. We believe that this method is conceptually incorrect and that it significantly distorts the measurement of the national rate of return on additions to the stock of corporate capital.[2]

Although all of the taxes paid by corporations are costs from the private viewpoint of the shareholders, these taxes do not represent social costs.

---

[1] The term "property tax" refers to taxes levied on the value of physical assets while "profits taxes" are levied on the income generated from these assets.

[2] The national income accounting convention of treating property taxes as a cost of production rather than as a tax on capital appears to be based on accepting the business accounting convention that the property tax is a "cost" because it is subtracted in calculating business profits; see Ruggles and Ruggles, 1956. A further reason offered in defense of the conventional national income accounting method is that the property tax is "an indirect tax" and therefore presumably has a very different incidence than the direct capital income taxes; see Ruggles and Ruggles, 1970. We believe that the property tax and the tax on profits cannot usefully be distinguished in either of these ways.

THE EFFECTIVE TAX RATE AND
THE PRETAX RATE OF RETURN

Martin Feldstein*
James Poterba**
Louis Dicks-Mireaux*

This paper presents new estimates of the pretax rate of return on nonfinancial corporate capital in the United States and on the effective rate of tax paid on that return. We then use these estimates to examine whether there has been any systematic decline in the rate of return and to study the sources of variation in profitability. Our estimates of the rate of profit during the past quarter century use the most recent national income account revisions and the latest estimates by the Department of Commerce and the Federal Reserve Board of the stocks of reproducible capital and land. In addition, we have developed our own estimates of the property tax paid by nonfinancial corporations to state and local governments, a significant component both of taxes and of pretax profits that was omitted in all previous studies.

These estimates of property taxes and their implications for the pretax rate of return are discussed in the first two sections of the paper. The effective tax rate reflects the taxes paid by corporations, their shareholders and their creditors to governments at all levels. Section 3 of the paper discusses the estimation of these taxes and the implied behavior of the effective tax rate.

---

*Harvard University and National Bureau of Economic Research. **Oxford University and National Bureau of Economic Research. This study is part of the NBER Study of Capital Formation. An earlier version of sections 1 through 3 appeared in NBER Working Paper 508R by Feldstein and Poterba. These sections were revised to reflect new national income and capital account data. Dicks-Mireaux participated in this revision and in sections 4 and 5. The authors are grateful to the NBER and NSF for financial support and to Lawrence Summers for comments. We benefited also from discussion of an earlier version of this paper at the ISPE-NBER Conference on Capital Taxation. The views expressed here are the authors' and not an official statement of the NBER.

082581

Similarly, the taxes paid by business to state and local governments do not represent charges for benefits received. From the national viewpoint, the marginal product of capital is therefore the total addition to national output and not that addition net of the taxes levied on capital or capital income. A correct measure of capital productivity therefore requires adding the state and local property taxes to the national income measure of pretax income.[1] This section presents alternative estimates of the state and local property taxes paid by nonfinancial corporations.

In 1979, state and local governments collected more than $32 billion in taxes on the capital or capital income of nonfinancial corporations. This includes the state personal income taxes on the dividends of shareholders as well as the state and local taxes on corporate property and profits. State and local taxes on the capital income of nonfinancial corporations now exceed 17 percent of real pretax capital income and 70 percent of that income net of all federal, state and local taxes. It is clear from these figures alone that recognizing state and local taxes is important for calculating the total effective tax rate on capital income as well as for assessing the pretax rate of return on corporate capital.

Nonfinancial corporations pay two types of state and local taxes that are based on capital or capital income: corporate profits taxes and property taxes. Since there are no official estimates of either type of tax paid by nonfinancial corporations, we now describe our own method of estimation.

---

[1] This expanded pretax profits differs from the social product of capital if there are externalitites, economic rents, nonconstant returns to scale, or monopoly power. This distinction will be ignored in the current paper.

The total corporate profits tax accruals of state and local governments for all types of corporations is calculated by the Department of Commerce and published in the National Income and Product Accounts.[1] The value for 1979 was $13.0 billion. We divide this amount between nonfinancial and financial corporations in the same ratio as the federal corporate income tax accruals are divided between these two types of corporations. In 1979, for example, nonfinancial corporations accounted for 80 percent of total federal corporate tax liabilities.[2] On the basis of this information, we estimate that the state and local corporate tax liability for nonfinancial corporations was $10.4 billion. Similar values for other years since 1948 are shown in column 1 of Table 1. Note that the tax rose from only $1.1 billion in 1960 to $2.8 billion in 1970 and $10.4 billion in 1979.

The total value of state and local property tax collections appears in the national income and product accounts (Table 3) but no distinction is made between the taxes levied on the property of nonfinancial corporations and the taxes levied on the property of households, unincorporated businesses and financial corporations. The total state and local property tax receipts for 1979 were $64.4 billion. Because calculating the share of property taxes levied on nonfinancial corporations is difficult, we present three different estimates based on three different assumptions. All three estimates are based on the Department of Commerce series of the replacement value of stocks of reproducible physical assets

---

1 Table 3.4 of the NIPA contains a detailed breakdown of state and local government receipts.

2 The total corporate profits tax liability is reported in Table B-19 of the 1981 Economic Report while the corresponding figure for nonfinancial corporations is reported in Table B-11. The Department of Commerce follows the same procedure, based on the NFC's share of federal profits, for allocating state and local profits taxes. Therefore, the profits tax liabilities data reported, which include federal, state and local taxes, reflect the share of NFC federal profit taxes in total profit taxes.

TABLE 1

State and Local Property Tax Base and Tax Payments

by Nonfinancial Corporations

	State and Local Corporate Profits Tax (1)	Property Subject to State and Local Property Tax: Total (2)	Property Subject to State and Local Property Tax: Nonfinancial Corporations (3)	State and Local Property Tax Collections: Total (4)	Nonfinancial Corporations*: Equal Rate (5)	Nonfinancial Corporations*: 3 to 1 Rate (6)	Nonfinancial Corporations*: 1 to 3 Rate (7)
1948	0.6	498.9	157.5	5.9	1.874	3.447	0.791
1949	0.6	531.6	170.5	6.6	2.130	3.893	0.903
1950	0.7	574.4	182.6	7.1	2.271	4.165	0.961
1951	0.8	638.8	200.5	7.7	2.415	4.452	1.018
1952	0.8	686.7	216.7	8.4	2.645	4.866	1.117
1953	0.7	719.3	228.8	9.1	2.893	5.305	1.224
1954	0.7	752.0	239.3	9.7	3.079	5.644	1.303
1955	0.9	802.9	254.7	10.4	3.314	6.083	1.401
1956	1.0	873.2	280.7	11.5	3.682	6.723	1.562
1957	0.9	934.0	306.5	12.6	4.138	7.494	1.765
1958	0.9	981.0	323.1	13.8	4.533	8.198	1.936
1959	1.0	1,033.8	336.8	14.8	4.825	8.765	2.055
1960	1.1	1,081.5	349.4	16.2	5.245	9.560	2.228
1961	1.1	1,121.6	360.0	17.6	5.643	10.310	2.393
1962	1.3	1,168.6	373.3	19.0	6.056	11.086	2.565
1963	1.4	1,214.7	386.3	20.2	6.439	11.806	2.724
1964	1.6	1,272.3	401.0	21.7	6.835	12.577	2.884
1965	1.7	1,353.1	426.1	23.2	7.302	13.440	3.081
1966	2.0	1,452.3	462.2	24.5	7.809	14.314	3.304
1967	2.1	1,556.3	502.3	27.0	8.702	15.866	3.696
1968	2.6	1,677.0	541.5	29.9	9.654	17.597	4.101
1969	2.9	1,824.5	590.5	32.8	10.604	19.312	4.507
1970	2.8	1,970.4	649.1	36.7	12.081	21.848	5.160
1971	3.2	2,117.7	700.2	40.4	13.373	24.149	5.718
1972	4.0	2,318.1	751.9	43.2	14.021	25.513	5.963
1973	4.7	2,638.9	832.8	46.4	14.628	26.905	6.175
1974	5.3	3,079.2	984.8	49.0	15.665	28.661	6.637
1975	5.8	3,469.9	1,134.8	53.4	17.458	31.664	7.442
1976	7.6	3,814.9	1,229.8	58.2	18.776	34.248	7.972
1977	9.0	4,273.5	1,348.2	63.4	20.003	36.794	8.443
1978	9.5	4,908.5	1,510.7	63.9	19.681	36.547	8.254
1979	10.4	5,626.3	1,710.6	64.4	19.581	36.529	8.186

All figures are in billions of dollars.

Sources: Columns 1 NIPA Table 3.3. Remaining columns based on authors' calculations using data from Economic Report of the President (Tables B-11, B-19) and Balance Sheets of the U.S. Economy, tangible asset allocation table. See text for additional discussion.

and the Federal Reserve estimates of the current market value of land holding.[1]

More specifically, the total value of property that is subject to state and local property tax is calculated as the sum of plant and equipment, land, and residential structures minus the amounts of those types of assets owned by nonprofit institutions.[2] The total value of taxable property estimated for 1979 was $5,626 billion. Within this total, nonfinancial corporate business accounted for $1,711 billion or 30 percent of the total taxable capital stock.[3] Columns 2 and 3 of Table 1 present the two series of taxable capital stocks.

If all jurisdictions valued property for tax purposes at the replacement values and taxed all property at the same rate, it would be appropriate to assign state and local property taxes in the same ratio as the value of the property itself. In fact, however, effective tax rates differ substantially among jurisdictions and among property classes within jurisdictions. Within jurisdictions, business property tends to be taxed more heavily than residential

---

1 These estimates are presented in "Balance Sheets for the U.S. Economy," a periodical document of the Division of Research and Statistics of the Board of Governors of the Federal Reserve System. The figures used in the calculation presented in this paper are from the version dated April, 1981.

2 Data on land and reproducible fixed assets are presented in the table "Tangible Asset Allocations" of the document cited in the previous footnote. For 1979, the total value (including that held by tax-exempt non-profit institutions) was $5843 billion. State and local jurisdictions differ in their treatment of inventories; to be conservative, we exclude inventories from the tax base and thereby reduce the fraction of property taxes assigned to nonfinancial corporations.

3 Including inventories would raise the total taxable capital stock by $655 billion to $6281 billion; for nonfinancial corporations, the increase would be $539 billion to $2250 billion. This expanded definition would raise the share of nonfinancial corporate property from 0.30 to 0.36. This may seem a surprisingly small share of capital owned by NFCs; most of the remaining property is housing (41 percent) and agricultural land (8 percent).

property or agricultural land[1]; this implies that nonfinancial corporations bear more than a proportionate share of the total property tax. The variation in effective tax rates among jurisdictions could either strengthen this tendency or reverse it. Because of this uncertainty, we present three separate calculations. The first assigns property taxes in the same ratio as the value of the property; if the variation in tax rates among jurisdictions is uncorrelated with the mix of property types, this "equal tax" assignment is a conservative understatement of the property tax paid by non-financial corporations. The second method assumes that the effective tax rate on nonfinancial corporate property is three times the effective tax rate on other property.[2] The third method assumes the opposite imbalance: the effective tax rate on other property is three times the rate on the property on non-financial corporations. (The second and third calculations are almost certain to bound the true value.) For 1979, these two assumptions imply that nonfinancial corporations may pay as much as 56.7 percent of the total state and local property tax or as little as 12.7 percent.

Column 4 of Table 1 reports the total state and local property tax collections while columns 5, 6, and 7 report the property taxes assigned to nonfinancial corporations by the three assumptions. Note that the basic assumption of method 1 (i.e., the assumption that nonfinancial corporations pay the same effective tax rate as other property owners) implies that NFCs paid $19.6 billion in property taxes during 1979.

---

[1] The effective tax rate has two components: the assessment-price ratio and the tax rate on assessed value. The 1977 Census of Governments Taxable Property Values and Assessment-Sales Price Ratios reports the assessment price ratio on commercial and industrial property to be higher than that on any other class of property. Netzer's (1973) comments indicate that the equal effective tax rate assumption probably understates the taxation of business property.

[2] This implies that, for 1979, nonfinancial corporations paid 56.7 percent of the property tax even though they only had 30.4 percent of taxable property.

2. Expanded Profits and the Rate of Return on Capital

Several recent studies have estimated the total pretax return to capital with appropriate adjustment for the effects of inflation on the traditional accounting measures of corporate income.[1] The common procedure in all of these studies is to define total capital income as the sum of (1) corporate interest payments and (2) corporate profits with a capital consumption adjustment and inventory valuation adjustment.[2] The rate of profit is then calculated as the ratio of this measure of total capital income to the replacement value of the corporate capital stock defined to include fixed capital, inventories and land.[3] This rate of profit is the marginal product of capital if there are constant returns to scale and no economic rents or monopoly profits.

These estimates rely on the work by the Department of Commerce during the past decade that led to their publication of estimates of economic depreciation and of the replacement cost of fixed business capital.[4] The Federal Reserve Board's "Balance Sheets for the U.S. Economy" incorporate these Commerce Department estimates and also provide unpublished Commerce Department estimates of the market value of inventories and their own estimates of the market value

---

[1] See Nordhaus (1974), Feldstein and Summers (1977) and Holland and Myers (1979).

[2] There is no need to adjust for changes in the real value of corporate debt (due to inflation or interest rate changes) since any gain by the equity owners represents an equal loss to the creditors and leaves total capital income unchanged.

[3] Land is, of course, included at an estimated market value. Lovell (1978) presents estimated profit rates that include only plant and equipment in the capital stock; since inventories and land represent about 35 percent of the total NFC capital stock, this measure is very seriously incorrect.

[4] These data are more fully described in the April, 1976 issue of the Survey of Current Business.

of land. The capital stock is defined on a "net" basis[1] and capital income is defined in the corresponding way.

Columns 1 and 2 of Table 2 present this conventional measure of total corporate income and the implied net rate of return.[2] Column 3 expands the measure of total corporate income by including the estimate of the state and local property taxes paid by nonfinancial corporations on the assumption of equal effective rates of property tax on all types of property, i.e., column 3 is the sum of column 1 of Table 2 plus column 5 of Table 1. The corresponding rate of return, calculated by dividing column 3 by the same capital stock series that is used to go from column 1 to column 2, is presented in column 4.

For the 32 year period from 1948 through 1979, the total pretax rate of return (column 4) averages 11.5 percent. By contrast, the conventional return based on capital income after state and local property tax payments is only 10.3 percent. The failure to add state and local property taxes back into the total return to capital caused previous estimates to understate the rate of return by about 1.2 percentage points or nearly 11 percent. The estimates for overlapping decades (also shown in Table 2) indicate that this difference has remained fairly constant over the post-war period with some tendency for a larger gap in the second half of the period than in the first half.

---

[1] The capital stock is measured net of depreciation in contrast to a gross capital stock from which scrapping is deducted. All of the estimates in the present paper are therefore comparable to the "net" profitability series in Feldstein and Summers (1977) and not to the "gross" profitability series.

[2] These figures differ from the r_N series in Feldstein and Summers (1977) because of data revisions. Data revisions affect the earlier years in the series because of the new estimates of the values of land and inventories.

TABLE 2

Corporate Income and Rates of Return on Nonfinancial Corporate Capital

	NIPA Corporate Income (1)	NIPA Rate of Return (2)	Total Corporate Income (3)	Total Rate of Return*: Equal Rate (4)	Total Rate of Return*: 3 to 1 Rate (5)	Total Rate of Return*: 1 to 3 Rate (6)
1948	26.5	12.8	28.4	13.7	14.4	13.2
1949	24.0	10.8	26.1	11.8	12.6	11.3
1950	30.5	12.9	32.7	13.9	14.7	13.3
1951	34.5	13.1	36.9	14.0	14.8	13.5
1952	31.5	11.0	34.2	12.0	12.8	11.4
1953	31.3	10.5	34.2	11.4	12.2	10.9
1954	30.1	9.7	33.2	10.7	11.5	10.1
1955	40.0	12.2	43.4	13.2	14.1	12.6
1956	37.5	10.4	41.2	11.4	12.2	10.8
1957	37.0	9.4	41.2	10.5	11.3	9.9
1958	32.8	8.0	37.4	9.1	10.0	8.5
1959	43.3	10.2	48.1	11.3	12.2	10.7
1960	40.8	9.2	46.1	10.4	11.4	9.7
1961	42.2	9.3	47.8	10.5	11.5	9.8
1962	50.1	10.6	56.2	11.9	12.9	11.1
1963	56.0	11.4	62.5	12.7	13.8	12.0
1964	63.0	12.3	69.8	13.6	14.7	12.9
1965	73.8	13.5	81.1	14.8	16.0	14.1
1966	79.5	13.4	87.3	14.7	15.8	13.9
1967	77.6	11.9	86.3	13.3	14.4	12.5
1968	83.3	11.9	93.0	13.3	14.4	12.5
1969	80.6	10.5	91.2	11.9	13.1	11.1
1970	69.7	8.3	81.7	9.8	10.9	8.9
1971	80.2	8.9	93.5	10.4	11.6	9.6
1972	91.8	9.5	105.8	11.0	12.2	10.1
1973	101.7	9.5	116.3	10.8	12.0	10.0
1974	93.2	7.2	108.9	8.4	9.5	7.7
1975	116.9	7.9	134.3	9.1	10.0	8.4
1976	136.8	8.6	155.6	9.7	10.7	9.1
1977	159.6	9.1	179.6	10.2	11.2	9.6
1978	174.5	8.9	194.1	9.9	10.7	9.3
1979	181.9	8.1	201.4	9.0	9.7	8.4
1950-59	-	10.7	-	11.7	12.6	11.2
1955-64	-	10.3	-	11.5	12.4	10.8
1960-69	-	11.4	-	12.7	13.8	12.0
1965-74	-	10.5	-	11.8	13.0	11.1
1970-79	-	8.6	-	9.8	10.8	9.1
1948-79	-	10.3	-	11.5	12.5	10.8

The amounts in columns 1 and 3 are in billions of current dollars.

Sources: Calculations based on data from NIPA Table 1.13, Federal Reserve Board <u>Balance Sheets</u>, and Table One of the present paper.

Columns 5 and 6 present alternative estimates of the net rates of return based on the two extreme assumptions about the property tax rate on nonfinancial corporations and other types of property. The assumption that the non-financial corporations pay a property tax rate equal to three times the rate paid on other property yields the series shown in column 5 and implies that the conventional estimate of the rate of return understates the true value by about 2.2 percentage points. Conversely, the extreme assumption of 'undertaxation' of nonfinancial corporate property implies that the conventional estimate understates the true rate of return by about 0.5 percentage points (column 6). It seems safe to conclude that the truth lies somewhere between these extremes and that the conventional estimate of the rate of return has been too low by between one and two percentage points, implying that the true value exceeds the conventional estimate by between 10 and 20 percent.

3. Effective Tax Rates

The effective tax rate on the capital income of nonfinancial corporations depends on the federal, state and local taxes that are paid by the corporation itself and by the corporation's shareholders and creditors. These include the corporate income taxes, the property tax, the personal tax on dividends and capital gains, and the personal and corporate taxes on the interest income received by the creditors of the nonfinancial corporations.

In an earlier paper, Feldstein and Summers (1979) calculated the effective tax rate on the capital income of nonfinancial corporations. In contrast to previous studies that were limited to the corporate rate, the Feldstein-Summers analysis also included the federal taxes on dividends, capital gains and interest. They defined the effective tax rate as the ratio of the combined tax liability to the real pretax capital income. The present study redefines this tax rate in two fundamental ways. The total tax burden is expanded to include the state and local taxes discussed in Section 2 as well as the state and local taxes paid by shareholders and creditors. The real capital income of the nonfinancial corporations is also expanded by including the state and local property taxes. Since the effective tax ratio is less than one, adding equal amounts to the numerator and denominator (i.e., the state and local taxes paid by the corporations) would raise the ratio. In fact, the numerator is increased by more than the denominator (because of the taxes paid by individuals) so the effective tax ratio rises even more. In addition to this fundamental change in the definition of the effective tax rate, we also take this opportunity to make several smaller improvements in the previous Feldstein-Summers procedure.[1] A description of the tax rate data calculations is provided in the Appendix.

Table 3 presents each of the components of the total effective tax rate. The effective tax rate is expressed as a percentage of what we shall call the "adjusted real capital income" of the nonfinancial corporations. This adjusted income is the total pretax capital income of the nonfinancial corporations adjusted for the corporation's losses on non-interest bearing financial assets (cash, demand deposits and net trade credit). These losses are calculated as the product of the percentage change in the personal consumption deflator and the total value of these non-interest bearing assets.[2] We adjust

---

1 The calculation by Feldstein and Summers was concerned in part with evaluating the effect of an increase in the rate of inflation. The marginal tax rate on nominal profits created this way can differ in minor ways from the tax rate on nominal profits that results from an expansion of the capital stock, e.g., because of the special rules affecting life insurance companies. In the present paper we are not concerned with these special effects of changes in the inflation rate. See also footnote 1, page 20.

2. Annual series for these assets, calculated from the Federal Reserve "Balance Sheets," are presented in columns 1 and 2 of Appendix table A-1. The inflation rate for each year is computed as the first quarter to first quarter change in the personal consumption expenditure deflator.

TABLE 3

Components of the Total Effective Tax Rate on Nonfinancial Corporate Capital Income

Year	Adjusted Real Capital Income	Contributions to Total Effective Tax Rate: Federal Corporate Tax	State and Local Corporate Tax	State and Local Property Tax	Tax on Dividends	Tax on Real Capital Gains	Tax on Nominal Capital Gains	Tax on Interest	Total Effective Tax Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1953	33.5	53.0	2.2	8.6	8.5	0.7	0.7	1.0	74.7
1954	32.9	45.4	2.1	9.4	8.7	0.8	0.6	1.2	68.1
1955	42.9	45.0	2.1	7.7	7.7	1.2	0.8	1.0	65.4
1956	40.4	47.4	2.4	9.1	8.7	1.1	1.3	1.1	71.1
1957	39.8	45.7	2.3	10.4	9.0	1.1	1.6	1.5	71.6
1958	36.5	42.1	2.3	12.4	9.7	0.8	0.9	2.0	70.3
1959	47.2	41.7	2.2	10.2	8.0	1.2	1.0	1.8	66.0
1960	45.2	40.1	2.3	11.6	8.6	1.0	0.7	2.1	66.5
1961	47.3	38.9	2.3	11.9	8.3	0.9	0.4	2.3	65.0
1962	55.4	34.9	2.3	10.9	7.5	1.4	0.7	2.2	59.9
1963	61.6	34.7	2.3	10.4	7.5	1.4	0.5	2.0	58.9
1964	69.1	32.4	2.3	9.9	6.6	1.5	0.5	2.0	55.2
1965	80.0	31.8	2.2	9.1	6.2	1.7	0.7	1.9	53.5
1966	85.6	32.2	2.3	9.1	6.4	1.8	1.0	2.3	54.9
1967	84.9	30.2	2.5	10.3	6.8	1.6	1.0	2.7	55.0
1968	90.5	34.0	2.9	10.7	7.2	1.6	1.5	3.2	61.1
1969	88.2	34.3	3.2	12.0	7.2	2.2	2.8	4.3	66.1
1970	78.5	30.8	3.6	15.4	7.7	1.8	3.5	6.6	69.5
1971	90.5	29.4	3.6	14.8	6.7	2.0	3.1	5.9	65.4
1972	103.1	28.7	3.9	13.6	6.2	2.0	2.3	5.4	62.1
1973	111.8	31.5	4.2	13.1	5.8	2.9	3.2	6.1	66.8
1974	99.0	37.1	5.3	15.8	6.8	4.0	6.4	9.3	84.7
1975	125.2	28.3	4.6	13.9	6.4	2.6	6.6	7.8	70.3
1976	149.0	30.2	5.1	12.6	6.5	2.2	3.3	6.3	66.2
1977	171.4	29.4	5.3	11.7	6.2	2.6	3.5	5.9	64.6
1978	184.0	31.4	5.2	10.7	6.6	3.0	4.6	6.6	68.1
1979	187.2	31.7	5.5	10.5	6.9	2.6	4.2	8.0	69.4

Column 1 is in billions of currents dollars. All other columns are percentage rates.
See appendix for data sources.

these for inflation because they represent a real loss to the corporation without being a real gain to any explicit provider of corporate capital; i.e., the loss on net trade credit is similar to a price reduction, the loss on cash is a gain to the government, and the loss on demand deposits is a gain to commercial banks.

The adjusted real capital income series presented in the first column of Table 3 is based on the assumption of equal effective property tax rates. This series therefore differs from the figures in column 3 of Table 2 only because of the inflation adjustment. A comparison of these two series shows that the adjustment reduces the measure of real corporate income by about seven percent.

Column 2 presents the NFC federal corporate income tax payments as a percentage of this adjusted real capital income. The corresponding state and local corporate tax payments are shown in column 3. It is noteworthy that the state and local payments were only about five and a half percent of the federal payment in the 1950's but have recently risen to fifteen percent of the federal tax. Column 4 presents the state and local property tax payments (based on the equal effective rate assumption). The series shows a general upward trend but appears to have peaked in the early seventies and to be in decline since then. These three taxes have been grouped together because they are all collected directly from the corporation. The combined tax rate for these three types of taxes has dropped from 58.6 percent of adjusted real capital income in the first five years of this sample[1] (1953 through 1957) to 47.2 percent in the five years ending in 1979.

---

1 Data limitations on the marginal tax rate series used later in the calculation precluded extension of the effective tax rate series to the years before 1953.

The effective tax rate on dividends depends on the distribution of dividends among different classes of investors (households, pension funds, life insurance companies, etc.) and the average effective tax rate for each class of investor. The present study uses the Flow of Funds data on equity ownership to distribute dividends among classes of investors for each year since 1953.[1] Brinner and Brooks (1979) have calculated the tax rate on dividends received by individuals, including the state and local taxes; this rate averaged 43.2 percent for the years 1953 through 1979 and was 49 percent for 1979.[2] Individuals account for approximately 93 percent of the equity that the Flow of Funds sector statements of assets and liabilities classsify as belonging to "households"; the remaining "household" equity is owned by nonprofit organizations (foundations, universities, etc.) and trusts.[3] We make the conservative assumption that the dividends received by these "other household institutions" are untaxed. For the remaining dividend recipients, we follow the procedure of Feldstein and Summers (1979) and assume that insurance companies and banks pay a

---

1 This assignment assumes that equity in nonfinancial corporations is distributed in the same way as total equity and that dividends are distributed in proportion to total equity. This represents an improvement over Feldstein and Summers (1979) where the 1976 pattern of ownership was used to assign dividends in all years of the period.

2 To compute the federal tax on dividends, Brinner and Brooks constructed a weighted average of individual taxrates, using the fraction of dividends received by each taxable income class each year and the corresponding statutory marginal rates. State dividend taxes are estimated by assuming that the marginal rate on dividends is 1.5 times the average state personal tax rate, which can be computed from NIPA aggregates. Columns 3 and 4 of Appendix table A-1 provide the separate series for the federal and state taxes, which were kindly provided by Brinner and Brooks.

3 The 93 percent refers to 1975 and is based on a calculation described in Feldstein and Summers (1979); see Securities and Exchange Commission (1977), p. 11. Our calculation assumes 93 percent for all years.

tax rate equal to fifteen percent of the corporate tax rate[1] (i.e., 0.069 for 1979) and that pension funds, foreign equity owners, and other miscellaneous investors pay no tax. The relevant weighted average of these tax rates implies an overall tax rate on dividend income in 1979 of 34.9 percent.[2] Since the ratio of dividends to "adjusted real capital income" was 25.2 percent in 1979, the taxes on dividends added 6.9 percentage points (0.349 x 0.252 = 0.069) to the total tax as a percentage of adjusted real capital income. The series for all years is presented in column 5 of Table 3. The relative stability of this tax component reflects the underlying stability of the dividend-income ratio and the effective tax rate on dividends.[3]

The appropriate effective rate of capital gains tax reflects the distribution of equity ownership among different classes of investors and the fact that the capital gains tax is payable only when the asset is sold. The distribution of equity ownership has already been described in the previous paragraph. For the sample years before 1969, individual capital gains were taxed at half the individual's statutory rate on dividends, but subject to an "alternative" maximum rate of 25 percent. However, gains are taxed only if realized and the effective tax rate is reduced by the postponement of realization.[4] For the period between 1969 and 1978, the effective tax rate on

---

1 In calculating their taxable income, corporations are allowed to exclude 85 percent of the dividends received from other corporations.

2 The complete series of dividend tax rates is presented in column 5 of Appendix table A-1.

3 There is, of course, some decrease in the series after the tax cuts of 1963 and 1964 but the difference is quite small.

4 A gain can permanently escape being "realized" for tax purposes if the asset is bequeathed since the new owner is permitted to "step us" his basis for future tax liabilities to the market value at the time that the asset is received.

capital gains was raised in a number of ways: the use of the alternative tax was limited, the value of the loss offset was reduced, the "untaxed" portion of capital gains was subject to a minimum tax, and the amount of income qualifying for the maximum tax on personal services income was reduced. There is no way to provide an accurate evaluation of the weighted average capital gains tax rate for each year in our series. Instead, we shall make what we regard as the quite conservative assumption that households paid an effective rate of tax of only 5 percent on accruing capital gains except during the years 1969 through 1978 when the rate was 7.5 percent. Insurance companies and banks are taxed at a 30 percent statutory rate on capital gains realizations. We assume an effective rate of 15 percent on accruing gains because of the effect of deferral. Finally, we assume that pensions, foreign shareholders, and other "miscellaneous" investors pay no tax on capital gains. The overall effective tax rate on capital gains implied by these values was .044 in 1979 and .062 in 1978 (before the tax change).[1]

The capital gains tax rate must be applied to two kinds of capital gains: the rise in the real value that results from retained earnings and the rise in the nominal value that results from the general increase in the price level. The national income account estimate of retained earnings is deficient because it ignores the real gain that the equity owners make at the expense of the creditors. For example at the beginning of 1979 the net debt of nonfinancial corporations[2] was $738.2 billion. The 9.9 percent rise in the personal

---

1 A complete series of capital gains tax rates is shown in column 6 of Appendix table A-1. Note that while interest and dividends tax calculations are based on taxes which were actually paid, the capital gains tax rate is an estimate of the present value of the future tax liability which will be due when the gains are realized.

2 Computed from the Flow of Funds tables published by the Federal Reserve Board.

consumption expenditure deflator implied a gain to the equity owners of \$73.1 and an equal loss to the creditors.[1] The gain on outstanding debt must be added to real retained earnings[2] for each year to calculate the real increase in equity value.[3] Multiplying this real increase in equity values by the capital gains tax rate and dividing the product by adjusted real capital income gives the additional tax component shown in column 6 of Table 3. This source of tax is responsible for only between one percentage point and four percentage points of the total effective tax rate.

An additional capital gains tax liability results from the nominal increase in the value of corporate assets that accompanies a general rise in the price level. We abstract from the year-to-year stock market fluctuations and calculate the nominal rise in the value of the capital stock as the product of the capital stock at the beginning of the year and the rise in the GNP deflator .

1 Of course, the equity owners "paid for" some of this gain in the form of higher interest rates and, to that extent, national income account profits are lower. The issue here is clarifying the real allocation of the income between debt and equity and identifying the way in which this extra component of real income is taxed.

2 The real retained earnings are, of course, after the inventory valuation and capital consumption allowance adjustments.

3 This real increase in equity value is presented in column 7 of Appendix table A-1. We assume that an extra dollar of real retained earnings raises the market value of equities by one dollar. This abstracts from year-to-year fluctuations in stock market valuation. It also ignores the arguments of Auerbach (1978), Bradford (1979) and King (1977) that the capitalization of future tax liabilities may cause a dollar of retained earnings to raise share prices by less than one dollar.

during the year.[1] Multiplying this nominal increase in equity values by the capital gains tax rate and dividing the product by the adjusted real capital income gives the additional tax component shown in column 7 of Table 3. This source of tax was responsible for less than 1.5 percentage points of effective tax rate until the late 1960's but the rise in inflation since then has made this a more significant factor. In the five years ending in 1979, the accrued capital gains tax on this nominal increase was equivalent to an average tax on total income of 4.4 percent.

The final component of the total effective tax rate is the tax borne by the creditors of the nonfinancial corporations. Although there are federal, state, and in some cases, local taxes on interest income, we follow the very conservative procedure of including only the federal tax.[2] Feldstein and Summers (1979) used the Flow-of Funds accounts for 1976 to estimate the distribution of the net liabilities of nonfinancial corporations among households, pensions, commercial banks, savings banks, life insurance companies, government accounts, and a number of smaller categories. We use the relative weights implied by this analysis and also follow Feldstein-Summers in setting the household tax rate on this interest income at 35 percent, the mutual savings bank

---

[1] The GNP deflator is too broad an index while the fixed nonresidential investment deflator is too narrow (because it excludes inventories and land); however both indices rose almost exactly the same amount over the 17 year period and behaved quite similarly from year to year. Note that the equity owners receive the nominal gain on the entire capital stock and not just on the equity fraction. The value of the beginning-of-year capital stock for each year, found in the "Balance Sheets" document, is presented in column 8 of Appendix table A-1. The calculation abstracts from the depressing effect on share prices of unanticipated changes in inflation; see Feldstein (1980) and the other research cited therein.

[2] We do this because of the difficulty of calculating the state and local taxes on interest income, especially the taxes paid by financial corporations.

rate at 24 percent, and the rate for private pensions, government accounts, and "miscellaneous" creditors at zero. Life insurance companies are taxed under a special set of tax rules that make their effective rate depend essentially on the yield on their portfolio as well as the statutory corporate tax rate. We apply these rules to calculate a different tax rate for every year based on the prevailing Baa bond rate.[1] For commercial banks, nonlife insurance companies, and finance companies, we make the conservative assumption that one-third of their interest income is completely sheltered from all corporate taxes.[2] The combined tax rate on interest income[3] multiplied by the annual interest payments of nonfinancial corporations and the product divided by their adjusted real capital income gives the interest component of the total effective tax rate that is presented in column 8 of Table 3. This component contributed less than 2.5 percentage points to the total effective tax rate until 1966 but the rising interest rates since then raised this component to more than seven percentage points in 1979.

The combined total effective tax rate on the capital income of the nonfinancial corporate sector - i.e., the sum of federal, state, and local taxes on capital and capital income divided by the adjusted real capital income - is shown in column 9. This tax rate reached 69.4 percent in 1979; taxes took more than two-thirds of the total pretax income. Since 1973, the rate has

---

1 These rules (known as the Menge formula) imply that there is one marginal tax rate on the increase in income that occurs when interest rates rise and a different and lower marginal tax rate on the increase in income from an increase in the size of the portfolio. Because of their focus on the effect of inflation, Feldstein and Summers calculated the former; we calculate the latter.

2 This is equivalent to assuming that a larger portion is converted to capital gains or just postponed. The untaxed income is, of course, subject to further tax as the dividends and retained earnings of these financial corporations. We assume the same dividend-payout ratio, .461, as Feldstein and Summers.

3 This rate is presented in Column 9 of Appendix Table A-1.

exceeded 64 percent every year. By comparison, the rate was as low as 54 percent in the mid-1960's. The effective tax rates in the period from 1975 to 1979 were back to the same high level that prevailed in the early 1950's before accelerated depreciation, the investment tax credit, rate reductions, etc. This increase in effective tax rates occurred because of the interaction of inflation with existing tax rules and despite several statutory changes that, in themselves, would reduce the effective tax rate.[1]

Table 4 compares alternative effective tax rates and the implied net rate of return. Column 1 represents the combined effective tax rate from column 9 of Table 3. The real net rate of return on nonfinancial corporate capital is equal to the product of the pretax rate of return on capital (presented in column 4 of Table 2) and one minus the effective tax rate.[2] This return is shown in column 2 of Table 4. The real net rate of return for 1979 was only 2.7 percent. For the most recent five years, it averaged only 3.1 percent. The contrast with the mid-1960's is striking; in the five years from 1963 through 1967, the real net return averaged 6.2 percent. Columns 3 and 4 show the effective tax rates corresponding to the two alternative assumptions about state and local property taxes.[3] If the property of nonfinancial corporations is taxed

---

[1] The nature of the interaction between inflation and effective tax rates is discussed in Feldstein (1979) and Feldstein and Summers (1979).

[2] This is equal to the marginal real net return to providers of capital if the pretax return to capital is the marginal return to capital and if the effective tax rate is an effective marginal rate. As we have already noted, the pretax return to capital may differ from the marginal return if these are non-constant returns to scale, economic rents or monopoly profits. The effective tax rate may differ from the marginal effective tax rate if the marginal allocation of saving is different from the average saving pattern. In particular, the marginal tax rate will exceed the average rate if individuals are limited in the amount of low tax rate saving that they can do by such things as the limits on pensions and Keogh contributions.

[3] These alternative assumptions require changes in both the numerator, for taxes paid, and the denominator, for pre-tax income, of the effective tax rate ratios.

TABLE 4

Alternative Effective Tax Rates

and the Real Net Rate of Return

Year	Total Effective Tax Rate (1)	Real Net After Tax Rate of Return (2)	3 to 1 Property Tax Rate Assumption (3)	1 to 3 Property Tax Rate Assumption (4)	Federal Effective Tax Rate (5)
1953	74.7	2.9	76.4	73.4	72.8
1954	68.1	3.4	70.4	66.3	65.1
1955	65.4	4.6	67.5	63.8	62.8
1956	71.1	3.3	73.1	69.5	68.5
1957	71.6	3.0	73.8	69.8	68.8
1958	70.3	2.7	73.0	68.0	66.5
1959	66.0	3.8	68.6	63.9	62.4
1960	66.5	3.5	69.4	64.1	62.3
1961	65.0	3.7	68.2	62.4	60.5
1962	59.9	4.8	63.2	57.2	54.9
1963	58.9	5.2	62.2	56.3	54.1
1964	55.2	6.1	58.6	52.5	50.0
1965	53.5	6.9	56.8	50.9	48.6
1966	54.9	6.6	58.1	52.4	50.1
1967	55.0	6.0	58.5	52.2	49.6
1968	61.1	5.2	64.2	58.5	56.2
1969	66.1	4.0	69.1	63.5	61.3
1970	69.5	3.0	65.9	66.5	63.9
1971	65.4	3.6	69.1	62.2	59.1
1972	62.1	4.2	65.9	58.9	55.5
1973	66.8	3.6	70.1	64.1	61.5
1974	84.7	1.3	86.5	83.2	82.8
1975	70.3	2.7	73.3	67.7	65.6
1976	66.2	3.3	69.4	63.6	61.0
1977	64.6	3.6	67.8	62.0	59.3
1978	68.1	3.1	70.8	66.0	64.3
1979	69.4	2.7	71.9	67.4	66.1

See the appendix for data definitions.

more heavily than other property (column 3), the estimated effective tax rate rises by about three percentage points. Conversely, if nonfinancial corporations are taxed more lightly than other property (column 4), the effective tax rate falls by about two and one-half percentage points.[1]

The last column of Table 4 ignores state and local taxes completely and reports the effective federal tax rate defined as the ratio of the total federal tax to the real capital income net of the state and local taxes paid by the corporations.[2] This effective federal rate shows the same general movement over time as the effective total rate. In the five years ending in 1979, the rate averaged 63 percent - twelve percentage points higher than in the years 1963 through 1967.

4. Is the Rate of Profit Falling?

The average value of the pretax rate of return was 9.8 percent in the 1970's and thus substantially lower than the corresponding averages of 12.7 for the 1960's and 11.1 for the period from 1953 to 1959. Does the lower rate of return in recent years reflect a fundamental fall in the rate of profit or has it just been a cyclical or temporary change?

In a previous paper, Feldstein and Summers (1977) attempted to answer that question with data for a period ending in 1976. That study concluded that there was no statistical support for the view that there had been a gradual decline in the rate of return over the postwar period but found that the average return between 1970 and 1976 was some 1 to 2 percent lower than would have been

---

1 Note that the real net rate of return of column 2 is independent of the assumption about the effective property tax rate.

2 This is an updated version of the effective tax rate series reported in Feldstein and Summers (1979), Table 5. The series reported there included state and local profit taxes as well as federal taxes.

predicted on the basis of fluctuations in capacity utilization alone. The authors also cautioned that factors that contributed to the lower rate of return in the 1970's were likely to be transitory so that the fall in the return might also be only temporary.

In this section of the present paper we return to that earlier question with a procedure that has been improved in several ways. First, the real rate of return variable (R) is based on the recently revised national income account figures and reflects also our new estimates of the taxes paid to state and local governments. Second, we have extended the sample from 1976 to 1979. Third, as we explain below, we have developed a richer set of variables to measure the cyclical condition of the economy. Finally, we consider several other factors that were associated with the fluctuation in the rate of return during the past quarter century.

Equation 4.1 repeats the basic specification of the earlier Feldstein-Summers paper with the new sample and data. The variable R is the real pretax rate of return shown in column 4 of Table 2. The TIME variable is an annual trend beginning in 1953 and DUM70 is a binary variable equal to 1 in the ten years beginning in 1970 and equal to zero in all previous years. The capacity utilization variable, UCAP, is the Federal Reserve Board's index of capacity utilization. The equation is estimated with a first-order autoregressive transformation and the autoregressive parameter is shown as a coefficient of $\hat{\mu}_{-1}$. Standard errors are shown in parentheses.

$$(4.1) \qquad R = -1.19 + \underset{(0.070)}{0.030}\ TIME - \underset{(1.035)}{2.035}\ DUM70 + \underset{(0.058)}{0.150}\ UCAP + \underset{(0.027)}{0.53}\hat{\mu}_{-1}$$

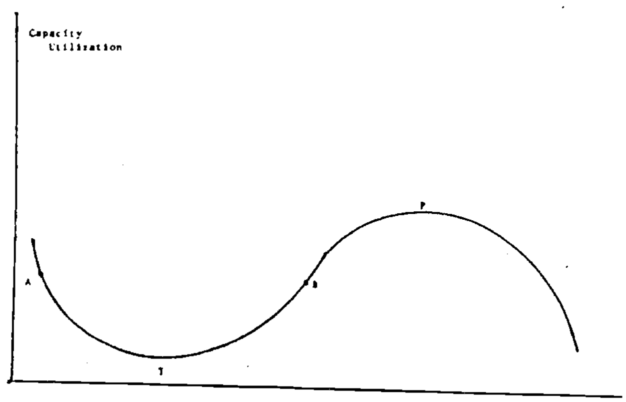
$\bar{R}^2 = 0.706$
DWS = 1.773
SSR = 19.45
1953-79

The results are very similar to the previous estimate. There is no evidence of a general time trend but an indication that the rate of return was some two percentage points lower in the 1970's than in the previous two decades. A higher rate of capacity utilization tends on average to raise the rate of return, each additional percentage point raising the rate of return by about one-sixth of a percentage point. Replacing the capacity utilization variable with the GNP-gap yields very similar results.

Although capacity utilization (or the GNP-gap) is intended as an indication of the economy's cyclical condition, it actually describes only one aspect of that cyclical condition. Figure 1 presents a business cycle diagram with the amplitude measured in terms of capacity utilization. The use in equation 4.1 of capacity utilization as a measure of the economy's cyclical condition is equivalent to treating points A and B as equivalent even though A

Figure 1

Capacity Utilization Business Cycle



occurs during a business cycle contraction (i.e., between a peak and the subsequent trough) while B occurs during a business cycle expansion (i.e., between a trough and the subsequent peak). Early research by Wesley Mitchell (1927, 1951) and others at the National Bureau of Economic Research suggested that profits decline during a business cycle contraction and then increase during a recovery. While these studies did not use regression methods to distinguish the effect of the level of activity from the cyclical position, we can do so in the current study by including an additional variable that indicates the phase of the cycle. More specifically, we have created a series of quarterly variables defined to equal one in the quarter in which the business cycle trough occurs[1] and in the three subsequent quarters, and to equal zero in all other periods. An annual series derived by averaging the quarterly values in each calendar year is denoted RECOVERY.

Although this early expansion phase of the business cycle is likely to be a time of above-average profits, further expansion may cause profits to decline. As the economy gets closer to the cyclical peak, there are problems with bottlenecks, older machinery, less experienced employees, etc. To investigate whether the end of expansion has an effect on profitability that goes beyond the effect of a high level of capacity utilization, we have created a variable that measures how close the economy is to reaching a cyclical peak. We create a quarterly series equal to zero during contractions and otherwise equal to the number of quarters until the peak is reached. The annual average of these quarterly values gives the annual variable QTILPK.

Several other cyclical variables were also examined, including the proportion of the year spent in recession, the number of quarters until a cyclical trough and an indicator of whether a trough occured in the year. None of these variables had a stable and statistically significant effect on the rate of return.

Equation 4.2 shows the effect of adding the two additional business cycle variables to the previous specification:

---

[1] The peaks and troughs used for this calculation are the standard NBER turning points: 1954: 2(T), 1957,3(P), 1958:2(T), 1960:2(P), 1961:1(T), 1969:4(P), 1970:4(T), 1973:4(P), 1975:1(T), 1980:1(P).

$$R = -16.06 + \underset{(0.048)}{0.016}\ \text{TIME} - \underset{(0.742)}{1.415}\ \text{DUM70} \tag{4.2}$$

$$+ \underset{(0.056)}{0.315}\ \text{UCAP} + \underset{(0.718)}{1.839}\ \text{RECOVERY} + \underset{(0.022)}{0.093}\ \text{QTILPK}$$

$$+ \underset{(0.25)}{0.50}\hat{\mu}_{-1}$$

$$\bar{R}^2 = 0.850$$
$$\text{DWS} = 1.50$$
$$\text{SSR} = 9.05$$
$$1953 - 79$$

The coefficient of the RECOVERY variable show that the rate of return tends to be about two percentage points higher during the first year of the recovery than it would otherwise be with the same level of capacity utilization. The coefficient of the QTILPK variable shows that the rate of return is higher during expansion than during contractions (when QTILPK = 0) but that this excess fades as the economy gets closer to the peak; each quarter further away from the peak adds about one tenth of a percentage point. Capacity utilization continues to be an important variable; indeed, its coefficient is twice as large in 4.2 as it was in 4.1 when the other cycle variables were not taken into account. The coefficients of the time trend variable and the dummy variable for the 1970's are also similar to those of equation 4.1, indicating no time trend but a reduction of about 1.5 percentage points in the 1970's.

The coefficients of equation 4.2 show that the explicit business cycle variables provide information about the fluctuations in profitability that are not captured in simpler measures of aggregate demand like capacity utilization and the GNP cap. As a further test of the usefulness of measuring activity relative to the business cycle peaks and troughs, we added a four year distributed lag in the capacity utilization variable. The explicit business cycle variables are still very significant; the coefficients are more than three times their standard errors. Of the lagged capacity utilization variables, only the first is statistically significant; its coefficient is negative, small and a bit less than twice its standard error. For the analysis of profitability, the explicit business cycle variables are clearly better.

The specification of the time trend and level shift in equations 4.2 and 4.3 was used to permit comparison with the earlier results in Feldstein and Summers (1977). We have also examined a wide variety of alternative specifications of the relation between time and profitability. Each of these specifications included three variables: (1) a time trend; (2) a level shift variable, i.e., a dummy variable equal to zero before a given year and equal to one in that year and beyond; and (3) a trend shift variable, i.e., an interaction between the time trend and a dummy variable equal to zero before a given year and equal to one in that year and beyond. The time of the level shift was not constrained to be the same as the time of the trend shift; all years from the mid-1960's to the mid-1970's were considered for both shift variables.

The specification with the lowest sum of squared residuals has a level shift in 1970 (just as equations 4.1 and 4.2) and an additional trend shift in 1973:

$$\text{(4.3)} \qquad R = \underset{}{-16.74} + \underset{(0.035)}{0.082}\ \text{TIME} - \underset{(0.588)}{1.266}\ \text{DUM70}$$

$$\underset{(0.016)}{-0.053}\ \text{TIME} * \text{DUM73} + \underset{(0.043)}{0.313}\ \text{UCAP}$$

$$+\underset{(0.686)}{1.875}\ \text{RECOVERY} + \underset{(0.017)}{0.083}\ \text{QTILPK} + \underset{(0.34)}{0.15}\hat{\mu}_{-1}$$

$\bar{R}^2 = 0.892$
DWS = 1.630
SSR = 6.17
1953-79

This specification implies a much faster rate of growth of profitability both before 1972 (.082 percentage points a year) and even after 1973 (.029 points a year) than the insignificant time trend of equation 4.2. Like the earlier specification, this also implies a drop in profitability of about 1.3 percent in addition to the change in the profitablity trend.

It should be emphasized that these three time variables should not be extrapolated outside the sample period. They are really a way of describing the complex time pattern of profitability during the 27 year sample and should not be given a more structural interpretation. A useful way of summarizing the implication of the three time variables is to evaluate the sum of the three effects for each year. The variable constructed in this way shows the pure time-related changes in profitability after excluding the cyclical and random variations in profitability. Column 2 of Table 5 presents this composite trend variable. For comparison, column 1 shows the real net return variable. Column 3 presents the cyclically adjusted rate of return, i.e., the rate of return with the three cyclical variables evaluated at their sample means.

The mean values of the composite trend variable are a useful way of assessing the extent to which profitability declined in the 1970's relative to earlier years after taking account of cyclical and random fluctuations. For the period 1953 to 1969, the average value of the composite trend variable was 1.23; by contrast, it was -0.06 for 1970 to 1979. This trend profitability was 1.31 percentage points lower in the 1970's than in the previous 17 years. A similar comparison between the 1960's and the 1970's shows that trend profitability was 1.59 percentage points lower in the 1970's. Since total profitability fell 2.9 percentage points (from 12.7 percent in the 1960's to 9.8 percent in the 1970's), cyclical and random fluctuations account for 45 percent of the fall (i.e., 2.9 -

Table 5

Variations in Profitability

Year	Pre-tax Real Net Rate of Return (1)	Composite Trend (2)	Cyclically Adjusted Profitability (3)
1953	11.436	0.572	10.540
1954	10.704	0.654	10.877
1955	13.208	0.736	11.886
1956	11.373	0.817	11.117
1957	10.480	0.899	11.355
1958	9.129	0.981	11.100
1959	11.316	1.063	12.085
1960	10.426	1.144	12.453
1961	10.501	1.226	11.361
1962	11.885	1.308	11.037
1963	12.720	1.390	11.562
1964	13.628	1.471	12.120
1965	14.848	1.553	12.448
1966	14.668	1.635	12.107
1967	13.277	1.717	12.371
1968	13.257	1.798	12.644
1969	11.919	1.880	11.888
1970	9.764	0.695	10.873
1971	10.415	0.777	11.244
1972	10.986	0.859	11.493
1973	10.819	-0.502	10.365
1974	8.450	-0.473	9.387
1975	9.073	-0.445	10.362
1976	9.743	-0.417	10.751
1977	10.226	-0.388	10.789
1978	9.852	-0.360	9.986
1979	8.955	-0.332	9.022
1953-59	11.1	.82	11.3
1955-64	11.5	1.10	11.6
1960-69	12.7	1.51	12.0
1965-74	11.8	.99	11.5
1970-79	9.8	-0.06	10.4
1953-69	12.0	1.23	11.7

See appendix for data definitions.

1.59 divided by 2.9) and the composite trend accounted for the remainder.

Two specifications in addition to the combination of a 1970 level shift and 1973 trend shift provided nearly as good an explanation of the profitability series; all the other specifications covered in our search were considerably worse. The first of these other two specifications includes a positive level shift in 1969 and a negative trend shift in that same year. The second specification has a negative level shift in 1973 and a negative trend shift in 1970. Although the three specifications imply minor differences in the timing of the change in profitability, they have very similar implications about the change in profitability between the 1970's and the earlier years of the sample. In comparison to the 1.31 percentage point difference implied by equation 4.3, placing both shift dummies in 1969 implies a difference of 1.25 percentage points while placing the shift dummies in 1970 and 1973 implies a difference of 1.23 percentage points. Similarly, comparing the 1960's and the 1970's shows differences of 1.59 in the specification of equation 4.2 and 1.58 and 1.61 in the other two specifications. The cyclically adjusted profitability figures shown in column 3 of Table 5 show a similar pattern. For the 1970's as a whole, the cyclically adjusted profitability was 1.6 percentage points below the corresponding figures for the 1960's.

It is interesting to note that all three measures of profitability have changed in the same direction and that the effective tax rate moved in the opposite direction. The total effective tax rate averaged 69.6 percent in the 1950's, 59.6 percent in the 1960's, and 68.7 percent in the 1970's. There was obviously no tendency for the pretax return to rise and fall in parallel to the effective tax rate in order to dampen the effect on the net-of-tax rate of return. Instead, the two moved in opposite directions and thereby caused proportionately greater movements in the real net-of-tax rate of return.

It is appropriate to conclude this discussion with a word of caution. Without understanding why profitability was lower in the 1970's than in the earlier period, it is not possible to say whether there has been a permanent or temporary decline. Only the experience of the future will provide a definite answer. Some additional insight can, however, be obtained by examining some of the factors that may have contributed to the variation in profitability. Such an exploration is the subject of the next section.

5. Sources of Profitability Variation

To go beyond the trend and cycle analysis of section 4, we have considered several aspects of the economic environment that have fluctuated significantly over the past two and a half decades and that are potential determinants of the level of profitability. This section describes each variable and its effect both on profitability and on the otherwise unexplained fall in profitability between the 1960's and 1970's.

The rate of growth of productivity per man hour rose rapidly in the 1960's and then dropped to successively lower values in the 1970's. Since the reasons for the productivity decline are still very poorly understood, "explaining" profitability in terms of productivity growth is of limited value. Nevertheless, any neutral technological shift that reduces productivity is likely to be reflected in profitability. The same is true of lower effective labor inputs per man hour (because of changes in the composition of the labor force or of individual effort) but would not be true of lower productivity caused by a reduced input of capital.

Equation 5.1 shows that productivity growth does have a significant effect on profitability and that including it leaves the other coefficient qualitatively unchanged.

(5.1)

$$R = -15.48 + \underset{(0.026)}{0.100}\ TIME - \underset{(0.012)}{0.041}\ TIME{*}DUM73$$

$$-\underset{(0.437)}{1.667}\ DUM70 + \underset{(0.031)}{0.293}\ UCAP + \underset{(0.454)}{1.632}\ RECOVERY + \underset{(0.015)}{0.046}\ QTILPK$$

$$+\underset{(0.073)}{.290}\ PRODGRO + \underset{(0.29)}{0.15}\ \hat{\mu}_{-1}$$

$\bar{R}^2 = 0.940$
DWS = 1.57
SSR = 3.26
1953-79

The coefficient of the productivity growth variable (PRODGRO) implies that each additional percentage point of productivity growth has associated with it a 0.3 percentage point increase in profitability.

The lower rate of productivity growth in the 1970's contributed significantly to the decline in profitability but was not responsible for the change in the composite trend variable. The coefficients of equation 5.1 imply composite trend values of 0.52 for the 1970's, 1.85 for the 1960's and 1.50 for the entire sample period before 1970. The gap between the profitability of the 1960's and the 1970's is narrowed to 1.32 percentage points while the difference between the 1970's and all the preceding years is 0.98 percentage points. The fall in productivity growth from an average of 2.5 in the 1960's to 1.4 in the 1970's decreased profitability by .32 percentage points or about 24 percent of the overall profitability decline.

A higher inflation rate can reduce pretax profitability in a variety of ways. For example, firms may seek greater after-tax profits by investing in inventories and other assets with more favorable tax treatment. Alternatively, firms may be misled into making low-profit investments or inappropriate pricing decisions by accounting calculations that do not correctly adjust for inflation. When the annual rate of increase of the GNP deflator is added to the basic specification of equation 4.2, its coefficient is significantly negative and implies that each percentage point of inflation reduces profitability by 0.20 percentage points. The rise in inflation from an average of 2.5 percent a year in the 1960's to 6.5 percent in the 1970's implies a profitability decline of 0.8 percentage points. The inclusion of the inflation variable does not however have a substantial effect on the change in the composite trend variable. Its value is calculated to be 2.22 for the 1960's and 1.32 for the 1970's, a decline of .90 percentage points. Moreover, when the productivity growth variable is added to the equation, the coefficient of the inflation variable becomes much smaller and statistically insignificant. The inflation variable is of interest therefore only if one believes that productivity growth is not a legitimate explanatory variable either because it is an alternative measure of a common phenomenon or because it is itself the result of lower profitability.

One reason why inflation may reduce profitability is that conventional historic cost accounting methods cause an overstatement of profits when there is inflation. Depreciation is understated and artificial inventory profits are recorded (see, e.g., Feldstein and Summers, 1979). If firms do not see this, they may believe that their costs are lower than they actually are and, as a result, may fail to make as much in real profits as they should. Although this effect is caused by inflation, it is not proportional to current inflation since the depreciation effect depends on the history of inflation and investment as well as the current inflation value. The national income and product accounts provide annual data on nominal book profits for nonfinancial corporations. When the ratio of these nominal profits to the real profits that we have calculated (and reported in section 1) is added to the basic specification, its coefficient is large and statistically significant (-3.98 with a standard error of 1.21). For the 1970's as a whole, the average value of this nominal to real profits ratio was .99 while for the 1960's it was 1.25. The increase in the ratio thus implies a fall in pretax profitability.

Including this accounting ratio variable reduces the size and statistical significance of the time variables. In this specification, the composite trend variable is .03 for the 1970's and .77 for the 1960's, implying a fall of only .74 percentage points. Similarly, between the 1970's and the entire pre-1970 sample period, the difference is only .59 percentage points. If this is a correct estimate of the effect of the accounting error, it can be assumed to be only a temporary influence until firms see through the accounting convention and assess costs and profits more accurately.

Adding the productivity growth variable reduces the coefficient of the accounting ratio to -2.13 and raises its standard error to 1.60. In this more general specification, the accounting ratio can at most be considered marginally significant. Moreover, the composite time trend implies a more substantial decline of 1.10 percentage points between the 1960's and 1970's. The inference that a substantial part of the profitability decline is transitory because it reflects an accounting error is therefore conditional on regarding the productivity decline as an inappropriate explanatory variable.

The jump in the price of oil in 1973 and again in 1979 clearly disrupted normal economic behavior. It has been cited as a possible source of the decline in productivity growth (Bruno, 1981; Bruno and Sachs, 1980; Vinals, 1981) and may have contributed directly to the profitability decline as well. This would be true in the short-run to the extent that selling prices had already been fixed and even in the longer run to the extent that the higher energy price implies a smaller use of energy inputs that are complementary to capital in production. The coefficient of a dummy variable equal to one in the years 1973, 1974 and 1979 had the expected negtive sign: -0.971 with a standard error of 0.438. However, including this variable did not explain any of the composite trend which showed an even larger decline of 1.8 percentage points between the 1960's and 1970's. Adding the productivity variable, however, reduced the coefficient of this dummy variable to the size of its standard error and returned the changes in the composite trend variable to their usual values.

A more general way to incorporate the change in the relative price of oil and of other input prices as well is to use the ratio of an index of final sales prices of nonfinancial corporations to the index of intermediate input prices. The coefficient of this variable was, however, very small and statistically insignificant.

An alternative relative price variable, the ratio of final sales prices to unit labor costs, raised profitability; the coefficient of this price ratio was 20.2 with a standard error of 8.24. The relative price index rose from an average of .77 in the 1960's to .84 in the 1970's, implying a fall of 1.41 points in profitability. Including this variable did not, however, explain any of the fall in the composite trend variable. The new trend variable declined by 3.3 percentage points between the 1960's and 1970's. Moreover, much of the movement in the relative unit labor cost merely reflects the shift in productivity growth. When both variables are included, only the productivity growth variable is statistically significant and the composite trend change has the usual value.

In summary then, we have identified several variables that have influenced profitability during the past decades. Of these variables, only the rate of productivity growth, the rate of general inflation, and the ratio of accounting profits to real profits helped to explain some of the trend decline in pretax profitability. Adding the productivity growth variable to any specification leaves the other new variable statistically insignificant. The implication of this work, therefore, is that although several factors contributing to the profitability decline have been identified, a decline in cyclically-adjusted profitability of between one and 1.5 percentage points from the 1960's to the 1970's remains to be explained.

It should again be noted in conclusion that the fall in cyclically adjusted pretax profitability between the 1960's and 1970's occurred at the same time as a rise in the effective tax rate. Similarly, the rise in cyclically adjusted pretax profitability between the post-Korean war years of the 1950's and the decade of the 1960's occurred at the same time as a fall in the effective tax rate. There was no tendency for pretax profits to move in a way that offset changes in the effective tax rate.

6. Conclusion

This paper has presented new estimates of the taxes paid on nonfinancial corporate capital, on the pretax rate of return to capital, and on the effective tax rate. The basic time series show that both the pretax rate of return and the effective tax rate have varied substantially in the past quarter century.

An explicit analysis indicates that, after adjusting for different aspects of the business cycle, pretax profitability was between one and 1.5 percentage points lower in the 1970's than in the 1960's. The rate of profitability in the 1960's was also about one-half of a percentge point greater than the profitability in the 7 years of the 1950's after the Korean war.

Changes in productivity growth, in inflation, in relative unit labor costs, and in other variables are all associated with changes in profitability. None of these variables, however, can explain the differences in profitability between the 1950's, 1960's and 1970's.

Looking at broad decade averages, the effective tax rate and the pretax rate of return move in opposite directions, higher pretax profits occurring when the tax rate is high. There thus appears to have been no tendency for pretax profits to vary in a way that offsets differences in effective tax rates.

May 1981
Revised August 1981

Bibliography

Auerbach, Alan, 1979, "Share Valuation and Corporate Equity Policy," Journal of Public Economics 11 (1979) 291-305.

Bradford, David, 1979, "The Incidence and Allocative Effects of a Tax on Corporate Distributions," National Bureau of Economic Research Working Paper No. 349.

Brinner, Roger, and Stephen Brooks, 1979, "Taxation, Inflation, and Equity Values: Is There a Rational Linkage?" forthcoming in Economic Effects of Taxation (Washington: Brookings Institution).

Bruno, M. "Raw Materials, Profits and the Productivity Slowdown," NBER Working Paper No. 660, April 1980.

Bruno, M. and J. Sachs, "Macroeconomic Adjustment with Import Price Shocks: Real and Monetary Aspects," NBER Working Paper No. 340, April 1979.

Feldstein, Martin, 1978, "Inflation, Tax Rules, and the Long-Term Interest Rate," Brookings Papers on Economic Activity, 1978:1, pp. 61-109.

_________________, 1979, "Taxes, Inflation and Capital Formation," National Tax Journal, Vol. XXXII, No. 3, September, pp. 347-349.

_________________, 1980, "Inflation, Tax Rules and the Stock Market," Journal of Monetary Economics, July.

_________________,and Lawrence Summers, 1977, "Is the Rate of Profit Falling?" Brookings Papers on Economic Activity, 1977:1, pp. 211-27.

________________, 1979, "Inflation and the Taxation of Capital Income in the Corporate Sector, National Tax Journal, Vol. XXXII, No. 4, December, pp. 445-470.

Holland, Daniel and Stewart Myers, 1979, "Trends in Corporate Profitability and Capital Costs," in R. Lindsay (ed.), The Nation's Capital Needs: Three Studies, Washington, Committee on Economic Development.

King, Mervyn, 1977, Public Policy and the Corporation. London: Chapman and Hall.

Lovell, Michael, 1978, "The Profits Picture: Trends and Cycles," Brookings Papers on Economic Activity.

Mitchell, Wesley, 1927, Business Cycles: The Problem and Its Setting. New York: National Bureau of Economic Research, 1927.

________________, 1951, What Happens During Business Cycles, New York: National Bureau of Economic Research, 1951.

Netzer, Dick, 1973, "The Incidence of Property Tax Revisited," National Tax Journal, XXVI (4) December, pp. 515-535.

Nordhaus, William D., 1974, "The Falling Share of Profits," Brookings Papers on Economic Activity, 1974:1, pp. 169-208.

Ruggles, Nancy and Richard, National Income Accounts and Income Analysis, New York: McGraw-Hill, 1956.

Ruggles, Nancy, and Richard, The Design of Economic Accounts, New York: National Bureau of Economic Research, 1970.

Securities and Exchange Commission, Statistical Bulletin, June 1977.

Viñals, Jose, Factor Prices and Macroeconomic Activity, Unpublished Ph.D. Dissertation, Harvard University, 1981.

Appendix: Data Description

1. Table Three:
   Column 1: (Column 3, Table Two) - (Q1 to Q1 change in Personal Consumption Deflator (NIPA,7.1)*(Mid-year value for holdings of Cash, Demand Deposits, and Net Trade Credit, NFCs (FRBBS))

   The effective tax rates given in Columns 2 through 8 are the numbers described below divided by Column 1.

   Column 2: Federal Corporate Tax Receipts, NFCs (ERP, B-11)
   Column 3: Column 1, Table One
   Column 4: Column 5, Table One
   Column 5: (Appendix Table Column 5) *NFC Dividend Payments (NIPA, 1.13)
   Column 6: (Appendix Table Column 6) *(Appendix Table Column 7)
   Column 7: (Appendix Table Column 6) *(Appendix Table Column 8)
   Column 8: (Appendix Table Column 9) *(Net Interest Payments of NFCS, NIPA 1.13
   Column 9: Sum of Columns 2 through 8. (ETRATE).

2. Table Four:
   Column 1: ETRATE
   Column 2: (1-ETRATE)*(Column 4, Table Two)
   Column 3-4: As in 2, using columns 5 and 6 of Table Two.
   Column 5: See final note in Appendix Table A.1 below.

3. Table Five:
   Column 1: Column 4, Table Two.
   Column 2: 0.082*TIME - 1.266*DUM70 - .053*DUM73*TIME
   where TIME and DUM70, DUM73 are as defined in text.
   Column 3: Net Pretax Rate of Return (Table Two, Col. 4) - .313* avg (UCAP) -1.875*avg(RECOVERY) - .083*avg(QTILPK)
   where the averages are the sample means of the exogenous variables for the sample period, 1953-1979.

4. Appendix Table A-1.
   Columns 1-2: Data from FRBBS.
   Column 3: (TDIVTAX - SLTAXRATE)/(1-SLTAXRATE)
   TDIVTAX = unpublished series for the total effective dividend tax rate, all levels of government, provided by Roger Brinner of Data Resources, Inc.
   SLTAXRATE = State and Local Personal Tax and Nontax Receipts (NIPA 3.4)/(Rental, Proprietors, Wage and Salary, and Interest Income of Persons - NIPA 1.11)
   Column 4: SLTAXRATE
   Column 5: .93*Household and Nonprofit Equity Ownership (FF)*TDIVTAX + .15*ETRCORP* (Equity owned by Life and Other Insurance Companies, Savings and Commercial Banks (FF)) all divided by TOTALEQUITY. TOTALEQUITY is the sum of equity owned by households, pension funds, state and local government retirement plans, commercial banks, savings and loans, and life and other insurance companies.

Column 6: .93* Household and Nonprofit Equity Ownership (FF)*HHCAPRAT + .15* (Equity Owned by Life and Other Insurance Companies Savings and Commericial Banks (FF)) divided by TOTALEQUITY where HHCAPRATE = .05 for 1953-68, 1979 and .075, 1969-78.

Column 7: Undistributed Profits of NFCs with IVA and CCA (NIPA, 1.11) and author's calculations of net corporate debt (FF) times the Q1- Q1 percentage change in consumption deflator (NIPA)

Column 8: Beginning of year replacement value of plant, land, equipment, inventories, and residential structures (FRBBS)*Q1 to Q1 percentage change in the GNP deflator (NIPA, 7.1).

Column 9: This variable uses the net ownership of corporate debt information reported in Feldstein and Summers (1979, Table 3) INTTAXRATE = .35*(45.5) + 237.7*MTRFINCOS + .24*30.7 + 141.7*MTRLIFEINS, all divided by 556.2.

Where ETRCORP = FEDCORPRATE + (Column 1, Table 1)/NFC Profits (NIPA 1.13)
MTRFINCOS = .66*FEDCORPRATE + (1-.66*FEDCORPRATE)*(.461*(Col. 5) + .539* (Col. 6)).
FEDCORPRATE = statutory Corporate Tax Rate (DRI).
MTRLIFEINS = FEDCORPRATE* (Average BAA Rate for year (DRI) - 3)/10.

To compute the federal component of the tax rates Column 5 is recomputed using FEDDIVRATE (Column 3) in place of TDIVTAX and FEDCORPRATE in place of ETRCORP. This new column 5 is then used in computing column 9, and these two tax rates are used in calculating Column 5, Table 4, i.e., a total effective tax rate, as in Column 1, Table 4 excluding all state and local components.

DATA SOURCES:

NIPA: National Income and Product Accounts, published in various issues of the Survey of Current Business.

ERP: Economic Report of the President (Government Printing Office, Washington, 1980.)

FRBBS: Balance Sheets of the U.S. Economy, provided by the Division of Research and Statistics of the Board of Governors of the Federal Reserve Board. Dated April 1981.

FF: Flow of Funds Accounts, usually sector balances.

DRI: Data series provided courtesy of Data Resources, Inc.

APPENDIX TABLE A-1

Year	Nonfinancial Corporate Assets: Cash and Demand Deposits	Nonfinancial Corporate Assets: Net Trade Credit	Individual Dividend Tax Rates: Federal	Individual Dividend Tax Rates: State/Local	Total Dividend Tax Rate	Capital Gains Tax Rate	Real Increase in Equity Value	Value of Capital Stock in Current Dollars	Tax Rate on Interest Income
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1953	26.6	9.6	43.7	1.8	38.8	4.8	5.0	292.6	25.6
1954	27.4	9.8	43.6	1.9	38.9	4.8	5.8	305.8	25.3
1955	28.8	10.7	44.4	2.0	39.5	4.8	10.9	314.1	25.4
1956	29.1	11.8	44.1	2.2	39.2	4.8	9.4	342.5	25.8
1957	29.0	12.5	43.1	2.3	38.2	4.8	9.3	381.7	26.8
1958	29.6	13.9	42.8	2.4	38.0	4.7	6.5	403.8	26.8
1959	29.6	15.3	42.5	2.6	37.7	4.7	12.1	414.6	27.2
1960	28.7	16.3	41.5	2.7	36.7	4.7	9.7	435.1	27.2
1961	30.0	18.3	42.4	2.9	37.4	4.7	9.2	448.7	27.1
1962	33.1	19.9	41.5	3.0	36.5	4.7	16.2	462.0	27.0
1963	34.0	19.8	41.7	3.1	36.5	4.7	18.4	482.9	26.7
1964	33.1	19.7	38.0	3.3	33.4	4.6	21.8	499.2	25.7
1965	32.9	24.8	36.4	3.3	31.9	4.6	28.8	525.3	25.0
1966	32.7	26.1	36.9	3.6	32.4	4.6	32.9	566.4	26.1
1967	33.6	23.3	37.8	3.8	32.9	4.5	29.8	624.3	26.8
1968	36.2	24.3	39.2	4.2	34.0	4.5	32.3	675.4	29.4
1969	40.3	25.7	38.5	4.6	33.3	6.5	30.1	727.0	29.1
1970	43.6	27.0	38.3	4.8	32.8	6.4	22.1	803.0	30.6
1971	43.3	28.0	38.6	5.2	32.6	6.4	28.0	871.2	29.9
1972	43.8	31.0	37.8	6.0	31.5	6.3	32.9	924.8	29.3
1973	45.6	32.6	37.9	5.8	30.9	6.3	51.7	1,001.3	29.3
1974	47.0	50.6	39.3	5.8	31.5	6.3	62.7	1,148.3	30.9
1975	50.8	69.5	39.4	6.1	31.4	6.2	52.3	1,429.1	31.8
1976	54.7	72.5	40.7	6.4	32.3	6.2	52.4	1,532.1	31.0
1977	55.9	80.2	42.3	6.6	33.6	6.2	72.1	1,662.0	30.2
1978	59.0	89.0	43.1	6.6	33.9	6.2	90.0	1,850.2	30.9
1979	64.6	95.5	45.5	6.4	34.9	4.4	111.5	2,091.0	31.7

See section 3 for data definitions and sources.

The Appendix contains data source descriptions.