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The Falling Share of Profits

BY MOST RECKONINGS CORPORATE PROFITS have taken a dive since 1966. The share of corporate profits (including the inventory valuation adjustment, or IVA) in the gross national product fell from 11.0 percent in 1966 to a postwar low of 7.1 percent in 1970. In the recent expansion, the share has rebounded only to 8.5 percent of GNP during the profits boom of 1973.[1] Even with the "breathtaking" profits predicted for oil companies during 1974, the share is expected to decline to 8.1 percent.[2] The poor performance of corporate profits is not limited to the United States. A secular decline in the share of profits has also occurred in most of Western Europe.

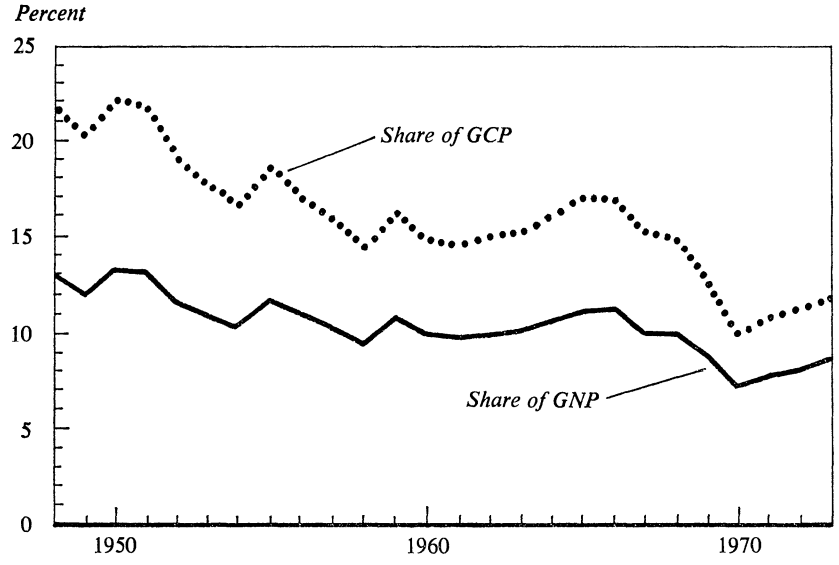
The complete record of the profit share is shown in Figure 1. By either measure depicted there—all corporate profits (plus IVA) as a share of GNP or the share of profits (plus IVA) in nonfinancial corporate product—the share has dropped considerably over the period; the 1971–73 ratio was 57 percent of the 1948–50 average. The postwar decline actually occurred in two distinct movements, 1948–54 and 1966–70, separated by a period

Note: This work was performed in part with the help of the National Science Foundation and the Ford Foundation. I am grateful for the comments of Wynne Godley and members of the Brookings panel. None of them is responsible for the views expressed here.

1. All calculations were performed on the mighty TROLL system. With exceptions noted below, all data are taken from the data bank of the National Bureau of Economic Research.

2. See Walter W. Heller and George L. Perry, "The U.S. Economic Outlook for 1974," Newsletter of National City Bank of Minneapolis, January 8, 1974.

Figure 1. Share of Profits in Gross National Product and in Gross Corporate Product of Nonfinancial Corporations, 1948–73



Source: Official U.S. Department of Commerce data from the data bank of the National Bureau of Economic Research.

during which the share fluctuated within a narrow band, mostly because of cyclical movements. Since 1970, the share has recovered somewhat.

The behavior of corporate profits has been a puzzle to many observers. Okun and Perry tended to discount the fall, attributing it to the unexpectedly large increase in labor's share from 1966 to 1969. They laid this increase partly to an abnormal rise in the real wage in 1968 but mainly to the productivity sag from 1966 to 1969.[3] R. J. Gordon's recent paper on price behavior also indicates a substantial decline in the markup of prices over unit labor costs in the late 1960s.[4]

What lies behind the crumbling of profit margins since 1966? Is the decline a statistical artifact? Was labor able to increase its share by aggressive bargaining? Or does the declining share of profits portend the euthanasia of the capitalist class, and indeed of capitalism itself?

3. Arthur M. Okun and George L. Perry, "Notes and Numbers on the Profits Squeeze," *Brookings Papers on Economic Activity* (3:1970), pp. 471–72. Hereafter this document will be referred to as *BPEA*, followed by the date.

4. Robert J. Gordon, "Wage-Price Controls and the Shifting Phillips Curve," *BPEA* (2:1972), p. 407.

A Closer Look at the Concepts

An attempt to explain the movement in profits requires, first, some attention to problems in the data. The raw movements in corporate profits may be a misleading indicator of underlying trends in profitability because of changes (1) in accounting conventions and depreciation provisions, (2) in the financial structure of corporations, (3) in the burden of corporate taxation, and (4) in the price level. The following sections recount the adjustments I made to the data on profits for each of these factors in an effort to obtain a more accurate measure of the return on corporate capital and its share of output. All data and analyses refer to the nonfinancial corporate sector.

The first correction takes account of the difference between economic depreciation and depreciation allowable for tax purposes. The official definition of profits subtracts the tax-allowable depreciation in calculating profits. This convention poses two separate problems. First, part of the changes in corporate depreciation merely reflects changes in the tax law in 1954, 1962, 1969, and 1971. Second, for tax purposes depreciation is taken on book value rather than replacement cost and thus generally understates economic depreciation. In order to calculate economic depreciation, I have adjusted tax-allowable depreciation for these two components. The results are shown in Table 1.

The total depreciation adjustment, shown in column (4), is very significant during the early years, a period in which rising prices meant that depreciation covered barely two-thirds of replacement needs. Later, the gap narrowed; and after the 1962 reforms, allowances actually became too generous. By 1969, however, the inflation had accelerated so much that even the liberalized depreciation guidelines were insufficient to make up the lag between book value and replacement cost. In 1973, it is estimated, profits were actually overstated by 3 percent because of the depreciation conventions.

The second adjustment deals with the considerable shift in the structure of returns to capital over the postwar period. The ratio of interest payments to corporate profits and IVA rose from 3 percent in 1948 to 24 percent in 1973. In part, this change reflected the expanded share of debt in corporate securities,[5] in part, the increase of nominal (but not real) interest

5. The ratio of net debt to the replacement cost of tangible assets for nonfinancial corporations rose from 16 percent in 1948 to 22 percent in 1973.

Table 1. Adjustment of Depreciation Allowances of Nonfinancial Corporations for Changes in Tax Laws and in Prices, 1948–73

Billions of dollars

Year	Capital consumption allowance (1)	Depreciation adjustment			Economic depreciation[a] (5)
		Change in tax laws (2)	Change in price level (3)	Total (4)	
1948	6.9	0.1	−3.5	−3.4	10.3
1949	7.8	−0.1	−3.4	−3.5	11.3
1950	8.6	−0.4	−3.6	−4.0	12.6
1951	10.1	−0.2	−4.4	−4.6	14.7
1952	11.3	0.0	−4.6	−4.6	15.9
1953	12.9	0.6	−4.3	−3.7	16.6
1954	14.7	1.5	−4.1	−2.6	17.3
1955	17.1	2.7	−4.2	−1.5	18.6
1956	18.5	2.9	−5.1	−2.2	20.7
1957	20.4	3.3	−5.7	−2.4	22.8
1958	21.5	3.2	−5.6	−2.4	23.9
1959	23.0	3.5	−5.5	−2.0	25.0
1960	24.3	3.4	−5.1	−1.7	26.0
1961	25.6	3.1	−4.5	−1.4	27.0
1962	29.3	5.3	−4.1	1.2	28.2
1963	31.0	5.2	−3.7	1.5	29.5
1964	32.9	5.2	−3.5	1.7	31.2
1965	35.4	5.7	−3.8	1.9	33.5
1966	38.4	5.9	−4.2	1.7	36.7
1967	41.7	6.0	−4.8	1.2	40.5
1968	45.1	6.3	−5.4	0.9	44.2
1969	49.5	7.4	−7.8	−0.4	49.9
1970	53.2	7.6	−9.1	−1.5	54.7
1971	58.1	8.2	−10.1	−1.9	60.0
1972	63.2	9.4	−11.4	−2.0	65.2
1973	68.3	10.2	−12.5	−2.3	70.6

Sources: Column (1) is from U.S. Office of Business Economics, *The National Income and Product Accounts of the United States, 1929–1965: Statistical Tables* (1966), Table 1.14, line 18, and *Survey of Current Business*, relevant 1971–74 issues, Table 1.14.

Column (4) through 1971 and column (5) through 1967 are from John A. Gorman, "Nonfinancial Corporations: New Measures of Output and Input," *Survey of Current Business*, Vol. 52 (March 1972), Table 1, pp. 22–23. Later data were made available by the U.S. Bureau of Economic Analysis. To break down the total depreciation adjustment into that due to tax laws (2) and that due to the difference between book value and replacement cost (3), I used estimates from Allan H. Young, "Alternative Estimates of Corporate Depreciation and Profits: Part II," *Survey of Current Business*, Vol. 48 (May 1968), Table 4, pp. 22–23, lines 1 and 7 for 1948–64. Figures for 1965 to 1973 were made available by BEA. Column (3) is the residual and thus is more subject to error than other figures. Note that column (5) is the difference between columns (1) and (4).

a. Calculated as 85 percent of service lifetimes in U.S. Treasury Department, Bulletin "F" (rev., 1942), valued at replacement cost.

rates on corporate debt over the postwar period. Some reasons for these movements will be outlined below; suffice it to say here that they appear to be a rational response to changes in the tax system and to inflation. Under these circumstances the appropriate variable is the total share of property income, rather than profits alone. In what follows, then, I will examine *total capital income*—the sum of corporate profits and interest.

A third factor affecting corporate income over the postwar period was a wide variety of changes in taxation. The tax burden on corporate capital income reached a peak during the Korean War, with an average of 58 percent. The tax burden declined slowly, influenced by a number of legislative measures—liberalized depreciation, the investment tax credit, a drop in the corporation tax rate—as well as by economic forces—a lower rate of inflation and a higher debt-equity ratio. By the mid-1960s the effective rate was down to 39 percent; put differently, because of liberalized taxation the take-home pay of corporations—profits after corporation taxes—rose by 45 percent for every dollar earned.

How does a changing tax structure affect corporate behavior? This is one of the big unsettled questions of economics. Some economists feel that an altered tax on profits results in little shifting, at least in the short run; others argue that complete long-run shifting is a basic theorem of economic analysis. In any case, capital's take-home pay seems the best concept for exploring what has happened to profits' share over any extended period.

Table 2 collects these first three corrections to calculate "genuine capital income." This is the best estimate I can make of the after-tax earnings of capital, defined to include interest and a more satisfactory measure of economic depreciation.

The fourth problem in considering corporation profits is the effect of movements in the price level. As the halcyon days of stable prices recede into memory, many accountants and businessmen are addressing the problem of designing accounting principles for an inflationary economy. The necessary distinction for this purpose is the difference between "genuine" profits and "nominal" profits. Nominal profits are total returns to corporations, part of which—accrued capital gains on fixed capital and inventories —are owed mainly to the rise in the general price level and are therefore excluded from corporate returns in calculating genuine income.

The businessman's concept of income—or "book profits"—lies somewhere between genuine and nominal income. At this time, most business accounting practices value the stock and the depreciation on inventories

Table 2. Estimates of Genuine Capital Income Earned by Nonfinancial Corporate Capital, 1948–73

Billions of dollars

Year	*Corporate profits (before taxes) and IVA*[a] (1)	*Depreciation adjustment* (2)	*Net interest* (3)	*Capital income before taxes* (4)	*Corporate capital taxes* (5)	*Genuine capital income* (6)
1948	29.6	−3.4	0.9	27.1	11.9	15.2
1949	26.8	−3.5	1.0	24.3	9.5	14.8
1950	33.5	−4.0	0.9	30.4	16.7	13.7
1951	37.9	−4.6	1.1	34.4	21.0	13.4
1952	34.7	−4.6	1.2	31.3	17.8	13.5
1953	33.9	−3.7	1.3	31.5	18.5	13.0
1954	31.8	−2.6	1.6	30.8	15.7	15.1
1955	40.3	−1.5	1.6	40.4	19.8	20.6
1956	39.1	−2.2	1.7	38.6	19.8	18.8
1957	38.3	−2.4	2.2	38.1	18.9	19.2
1958	33.5	−2.4	2.7	33.8	16.3	17.5
1959	42.8	−2.0	2.7	43.5	20.8	22.7
1960	40.3	−1.7	3.0	41.6	19.5	22.1
1961	40.3	−1.4	3.5	42.4	19.8	22.6
1962	45.0	1.2	4.1	50.3	20.9	29.4
1963	48.6	1.5	4.5	54.6	22.9	31.7
1964	55.2	1.7	5.1	62.0	24.3	37.7
1965	64.1	1.9	6.0	72.0	27.6	44.4
1966	69.4	1.7	7.3	78.4	30.1	48.3
1967	65.1	1.2	9.0	75.3	28.4	46.9
1968	70.4	0.9	10.5	81.8	34.7	47.1
1969	62.1	−0.4	12.9	74.6	33.4	41.2
1970	50.7	−1.5	15.0	64.2	26.9	37.3
1971	59.2	−1.9	16.5	73.8	29.7	44.1
1972	67.3	−2.0	17.4	82.7	35.0	47.7
1973	79.3	−2.3	18.8	95.8	46.6	49.2

Sources: Capital income includes interest and profits but subtracts the adjustment for depreciation. Columns (1), (3), and (5) are from *National Income and Product Accounts*, Table 1.14, lines 25, 24, 27, respectively, and *Survey of Current Business*, relevant 1971–74 issues, Table 1.14. Column (2) is from Table 1. Column (4) is the sum of columns (1), (2), and (3). Column (6) is column (4) minus column (5).

a. Inventory valuation adjustment.

and fixed capital at historical cost. This means that "book" corporate income represents genuine income plus *realized* capital gains. The Commerce Department's treatment is a hodgepodge—removing realized capital gains on inventories, but leaving the book treatment on fixed capital. Thus only

part of the difference between book and genuine income is removed by the IVA, while the depreciation adjustment removes the remainder.

For purposes of comparison, it is possible to estimate nominal returns to corporate capital. Nominal returns, which are analogous to nominal interest on bonds or savings accounts, include not only genuine profits, but also accrued capital gains on inventory and fixed capital. These capital gains take two forms: first, the restoration of the IVA, as a realized gain on inventories; second, the accrued capital gains on corporate capital resulting from a rise in replacement cost. These nominal capital gains are something of an accounting fiction (as, of course, are all accounting concepts), since most of the assets that give rise to them cannot be readily liquidated. Nevertheless, if capital markets were perfect and if good markets for used capital existed, the nominal gain could be realized any old time a corporation wanted it. Table 3, which traces the adjustment from genuine to nominal returns, reveals the sizable capital gains by corporations—averaging about $35 billion—over the last five years. Remember, however, that most of the accrued capital gains experienced by corporations do not correspond to any real income. If all prices double, the firm will have accrued capital gains equal to the original value of capital, but no real variables will change: it can still pay only the same real dividends, buy the same amount of real investment, and so forth.

On the other hand, prices do not always move together; capital and consumer prices diverge both cyclically and secularly. To the extent that prices of capital goods rise faster than those of consumer goods, the firms have experienced real capital gains. If the real capital gains are added to genuine income, the result is the Haig-Simons concept of comprehensive income.[6] Over the postwar period as a whole, capital gains barely exceeded needs simply to maintain real income. Thus nominal income averaged 145 percent of genuine income; but if nominal income is reduced by the capital gains necessary to maintain the real value of capital in terms of consumption, it represents only 115 percent of genuine income.

What is the effect of inflation on genuine capital income? Consider a situation of stable prices, with a zero depreciation adjustment, and with corporations earning 10 percent before tax on an inventory stock of $200 billion and fixed capital of $800 billion. Assume lifetimes for inventories and

6. See Henry C. Simons, *Personal Income Taxation: The Definition of Income as a Problem of Fiscal Policy* (University of Chicago Press, 1938), Chap. 2.

Table 3. Calculations of Genuine and Nominal Income Earned on Nonfinancial Corporate Capital, 1948–73

Billions of dollars

Year	*Genuine capital income after taxes* (*1*)	*Capital gain adjustment for inventories* (*minus IVA*) (*2*)	*Capital gain on net capital stock* (*3*)	*Nominal capital income after taxes* (*4*)
1948	15.2	2.2	13.6	31.0
1949	14.8	−1.9	4.7	17.6
1950	13.7	5.0	2.2	20.9
1951	13.4	1.2	11.0	25.6
1952	13.5	−1.0	7.0	19.5
1953	13.0	1.0	1.9	15.9
1954	15.1	0.3	1.8	17.2
1955	20.6	1.7	4.7	27.0
1956	18.8	2.7	10.3	31.8
1957	19.2	1.5	10.0	30.7
1958	17.5	0.3	5.3	23.1
1959	22.7	0.5	2.7	25.9
1960	22.1	−0.2	1.5	23.4
1961	22.6	0.1	0.6	23.3
1962	29.4	−0.3	1.9	31.0
1963	31.7	0.5	2.1	34.3
1964	37.7	0.4	3.1	41.2
1965	44.4	1.5	5.5	51.4
1966	48.3	1.7	10.3	60.3
1967	46.9	1.1	14.2	62.2
1968	47.1	3.3	14.9	65.3
1969	41.2	5.5	24.8	71.5
1970	37.3	4.5	30.9	72.7
1971	44.1	4.9	27.0	76.0
1972	47.7	6.9	33.1	87.7
1973	49.1	17.3	26.2	92.6

Sources: Capital income includes interest and profits but excludes an allowance for depreciation. Genuine capital income excludes capital gains, while nominal capital income includes capital gains. Column (1) is from Table 2; column (2) is from *National Income and Product Accounts*, Table 1.14, line 31, and *Survey of Current Business*, relevant 1971–74 issues, Table 1.14. Column (3) is derived from Gorman, "Nonfinancial Corporations," Table 1. Column (4) = columns (1) + (2) + (3). Data for 1973 were made available by the Bureau of Economic Analysis.

fixed capital of one year and ten years, respectively; no debt; no productivity change; and a tax rate of 50 percent.

Now suppose all prices and wages start rising at a 5 percent rate. At the end of the first year, before-tax genuine profits will have risen to 105. The

IVA will be −10 and the depreciation adjustment 4, so book profits would increase to 119—a rise of almost 20 percent rather than 5 percent.

After-tax genuine profits behave differently. Since the IVA and depreciation adjustment are taxed at full rates, genuine profits after tax *fall* by 9 percent from 50 to 45.5, or by 13 percent to 43.3 in first-period prices. If long-term debt is added, the result is qualitatively the same. The incremental book profits are taxed at full rates and genuine profits show a decline. The fact that interest is not taxed will tend to cushion the drop in genuine profits. Thus an inflationary economy displays robust book profits, which climb roughly twice as rapidly as the inflation rate, while after-tax genuine profits decline sharply. This divergence will remain until the before-tax rate of return rises enough to offset the effects of the inflation; in the example, it would have to rise from 10 to 11.5 percent.

These accounting problems raise the question of whether it would be preferable to accelerate the trend toward use of replacement cost as the preferred method of accounting. Such a move would help reduce the effects inflation and other shocks have on both national and business accounts. Did Congress really intend to impose a higher effective corporate tax rate in inflationary years? Even more important is the fact that inflation enhances the advantage of debt finance. Serious consideration should be given to rendering both corporate accounting and tax treatment more immune to variations in the inflation rate.

RETURN TO CAPITAL

The foregoing adjustments to the data on corporate profits now permit an examination of the movement in the return to capital over the postwar period. For this purpose we will present two alternative concepts: the share of capital income in total corporate income and the rate of return on corporate capital.

Table 4 and Figure 2 show the movements in the share of capital income in total corporate income. In the figure, the curve labeled S_{GEN} is the share of genuine capital income in corporate income. The numerator of S_{GEN} is simply genuine capital income as shown in column (1) of Table 3. The denominator is net income accruing to corporations—gross corporate product less taxes and capital consumption; it is the equivalent of national

Table 4. After-Tax Share of Genuine and Nominal Capital Income in Total Nonfinancial Corporate Income, 1948–73

Percent

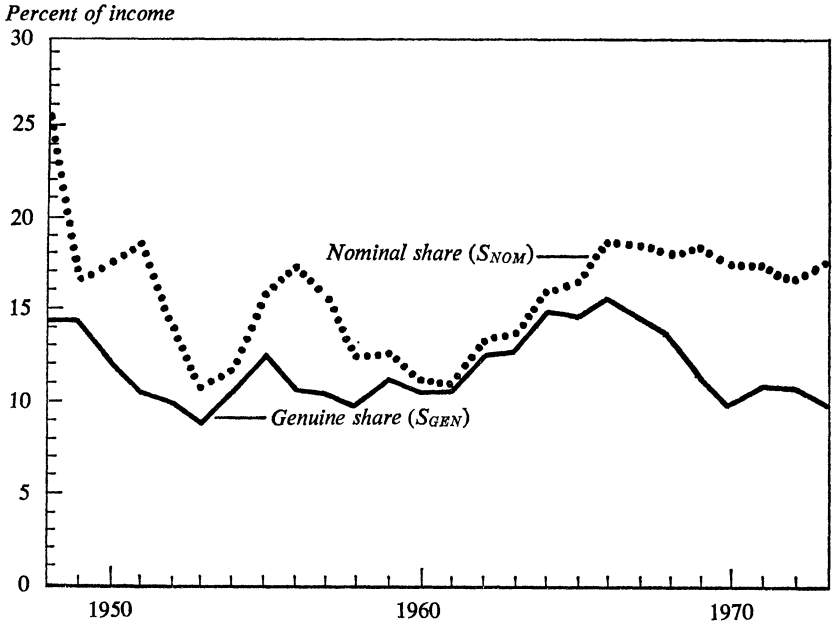
Year	*Genuine share*	*Nominal share*
1948	14.3	25.4
1949	14.3	16.5
1950	12.2	17.5
1951	10.5	18.3
1952	9.9	13.7
1953	8.8	10.6
1954	10.3	11.5
1955	12.5	15.7
1956	10.6	16.8
1957	10.3	15.6
1958	9.6	12.4
1959	11.2	12.6
1960	10.5	11.0
1961	10.5	10.9
1962	12.5	13.1
1963	12.8	13.7
1964	14.7	15.8
1965	14.4	16.3
1966	15.6	18.8
1967	14.5	18.4
1968	13.5	17.8
1969	11.1	17.8
1970	9.7	17.3
1971	10.8	17.2
1972	10.6	17.9
1973	9.8	17.0

Source: The genuine share is genuine capital income from Table 3, divided by genuine capital income plus compensation of employees (from sources cited in Table 2). The nominal share is nominal capital income from Table 3 divided by nominal capital income plus compensation of employees.

income less profits taxes and less the depreciation adjustment. Put another way, it is genuine capital income plus compensation of employees.[7]

7. The subtraction of profits taxes is a result of my presumption that profits taxes are eventually shifted. The U.S. national income accounts exclude indirect business taxes from national income but include profits taxes because of the presumption that indirect business taxes are shifted while profits taxes are not. Some analogous assumptions need to be made about labor taxes, especially social security and other payroll taxes. Most economists presumably would be more comfortable with the assumption that general payroll taxes are not shifted than with the assumption that corporation income taxes are not.

Figure 2. After-Tax Share of Genuine and Nominal Capital Income in Total Nonfinancial Corporate Income, 1948–73



Source: Table 4.

The second concept shown in Table 4 and Figure 2, S_{NOM}, is the share of nominal capital income in nominal net income accruing to corporations. In practice, S_{NOM} results from adding capital gains—shown in columns (2) and (3) of Table 3—to both the numerator and the denominator of S_{GEN}.

A second measure of the return to capital, shown in Table 5 and Figure 3, is the net rate of return on corporate capital. For comparison, Table 5 shows both before- and after-tax rates of return on corporate capital, defined as the ratio of income to the value of the physical capital stock in corporations. The income concepts are the same as those shown in Table 3. For the value of the capital stock, I have used Department of Commerce estimates of the replacement cost of corporate capital.[8]

8. John A. Gorman, "Nonfinancial Corporations: New Measures of Output and Input," *Survey of Current Business*, Vol. 52 (March 1972), pp. 26–27, Table 4. Gorman's data use lifetimes that are 85 percent of those of the U.S. Treasury Department's Bulletin "F" (rev., 1942), and include a correction for government-owned assets. Unfortunately, the capital data exclude land because of the poor quality of data on corporate land holdings. The significance of this is discussed below.

Table 5. Genuine and Nominal Rates of Return on Nonfinancial Corporate Capital, and Tax Rates, 1948–73

Percent per year

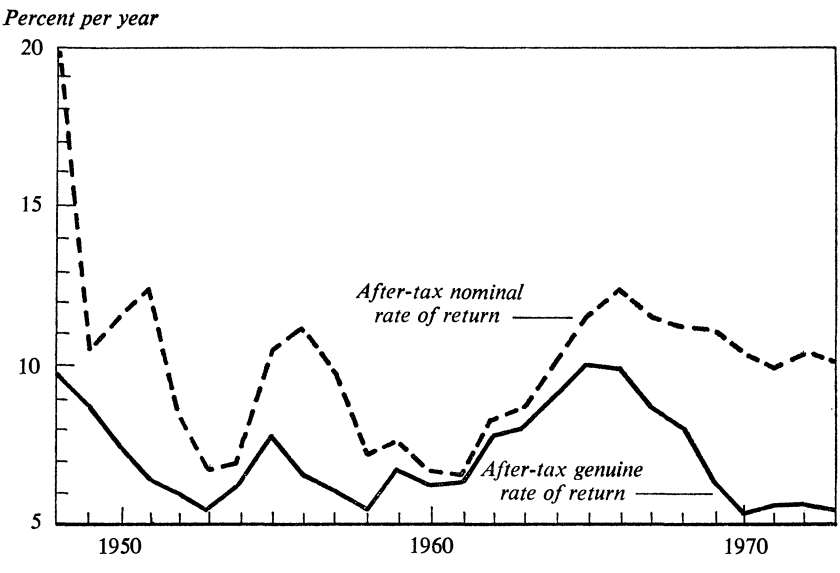
	Genuine rate of return		*Nominal rate of return*		*Tax rate on corporate income*	
Year	*Before tax* (r_1)	*After tax* (r_2)	*Before tax* (r_3)	*After tax* (r_4)	*Genuine income*	*Nominal income*
1948	17.3	9.7	27.4	19.8	43.9	27.7
1949	14.5	8.8	16.2	10.5	39.3	34.9
1950	16.7	7.5	20.6	11.5	55.1	44.2
1951	16.5	6.4	22.4	12.3	61.2	45.1
1952	13.8	6.0	16.5	8.6	56.5	47.9
1953	13.3	5.5	14.5	6.7	58.7	53.8
1954	12.5	6.2	13.4	7.0	50.4	47.8
1955	15.5	7.9	18.0	10.4	49.0	42.2
1956	13.4	6.5	18.2	11.1	51.4	39.0
1957	12.2	6.1	15.9	9.8	50.0	38.4
1958	10.4	5.4	12.1	7.1	48.1	41.3
1959	13.0	6.8	13.9	7.7	47.7	44.6
1960	12.0	6.3	12.3	6.7	47.5	44.5
1961	11.8	6.3	12.0	6.5	46.6	45.8
1962	13.5	7.9	13.9	8.3	41.5	40.3
1963	14.0	8.1	14.6	8.8	42.1	39.7
1964	15.0	9.1	15.9	10.0	39.3	37.1
1965	16.3	10.0	17.8	11.6	38.7	34.8
1966	16.1	9.9	18.6	12.4	38.5	33.3
1967	14.0	8.8	16.9	11.6	37.1	31.4
1968	14.0	8.1	17.2	11.2	42.1	34.9
1969	11.6	6.4	16.3	11.1	44.8	31.9
1970	9.1	5.3	14.1	10.3	41.8	26.9
1971	9.6	5.7	13.8	10.0	40.6	27.5
1972	9.9	5.6	14.7	10.5	43.4	28.6
1973	10.5	5.4	15.3	10.2	48.6	33.3

Sources: The genuine rate of return is the genuine capital income divided by the net stock of capital, while the nominal return is nominal capital income divided by the net stock of capital. All values are undeflated. The denominator for all calculations is the net stocks of all nonfinancial corporate capital, including an adjustment for valuation of government surplus assets, in current prices; the data are from Gorman, "Nonfinancial Corporations," Table 3.

The numerators are as follows: r_1 is Table 3, column (1), plus profits tax liabilities, from Table 2, column (5); r_2 is Table 3, column (1); r_3 is Table 3, column (4), plus profits tax liabilities; r_4 is Table 3, column (4).

The rates of return depicted in Figure 3 give the same basic impression as the share data in Figure 2. In terms of genuine income, one and one-half cycles appear over the period. Both the share and rate of return trace a definite downtrend from 1948 to the middle 1950s; a dramatic recovery

Figure 3. Genuine and Nominal After-Tax Rates of Return on Nonfinancial Corporate Capital, 1948–73



Source: Table 5.

from the late 1950s to the mid-1960s, with a peak in 1965 or 1966; and a deterioration to a plateau by 1970.

Nominal shares and nominal rates of return present a more complicated pattern. Roughly speaking, the nominal rate of return is the genuine rate of return plus the rate of inflation. This means that nominal rates of return lie significantly above genuine rates in the early postwar period and from the late 1960s to the present. Ignoring 1948, the nominal rates of return actually held up in the period after 1965–66 better than they had at any comparable interval in the postwar era.

A final subplot in the tale is outlined in the last two columns of Table 5, which give the tax rates on genuine and nominal versions of corporate capital income. They demonstrate dramatically the erosion of the effective corporate tax rate from the early 1950s to the mid-1960s by the many changes in tax structure. From the high point of 61 percent in 1951, the average effective tax rate on genuine income dropped 24 points to its low in 1967. Part of the reason was lower statutory rates, but just as important were the combined effects of the investment tax credit, liberalized depre-

ciation guidelines, and the shift in financial structure toward interest payments. The drop in the tax of nominal capital income was even more dramatic—from 54 percent in 1953 to 27 percent in 1970. One peculiarity of the series, the big jump in tax rates in 1973, is due solely to the fact that 1973's huge capital gains on inventories (that is, the IVA) are taxed at the full corporate tax rate.

Up to this point all data have concerned the rate of return on total capital, without explicitly accounting for corporate holdings of land. Since probably at least some part of corporate profits is a return on land holdings, a rough calculation seems desirable.

The latest comprehensive balance sheet for corporations covers the period from 1952 to 1968.[9] According to this study, the ratio of land holdings to total reproducible tangibles (all valued at replacement cost) rose from 8.1 percent in 1952, to 14.3 percent in 1960, and to 15.7 percent in 1968. Real capital gains (that is, the differential movement between land prices and consumer prices) averaged 10.3 and 3.0 percent annually over the subperiods 1952–60 and 1960–68, respectively. Adding real capital gains on land to genuine profits, and replacement cost of land to the value of capital, yields the following figures for genuine rates of return to tangibles (all expressed in percent):

Period	*Land as a share of all tangibles*	*After-tax genuine return to capital*	*After-tax genuine return to tangibles*
1952–60	11.2	6.3	6.7
1960–68	15.1	8.5	7.7
1952–68	13.1	7.4	7.2

These figures indicate that the exclusion of land makes little difference to the estimation of rates of return over the period as a whole; the total was overestimated by 0.2 percentage point. If the data are at all accurate, the overstatement in the second half of the period was more serious than the understatement in the first.

Perspectives on Profits

So much for the facts. I turn now to a discussion of various theoretical explanations of the postwar movements in corporate profits. The explanations fall naturally into two groups: short-run and long-run theories.

9. *Institutional Investor Study Report of the Securities and Exchange Commission, Supplementary Volume I*, H. Doc. 92-64, Pt. 6, 92 Cong. 1 sess. (1971), p. 312.

The short-run explanations of profits are the counterpart of modern theories about short-run pricing and productivity in the industrial sector. The first question, then, is the adequacy of these theories for explaining profits.

The question of the short-run behavior of prices and profits shades off naturally into long-run theories of the investment decision and profitability on capital. Modern price theories—with their emphasis on a fixed, arbitrary markup on labor or, more generally, on current costs—cannot explain how the markup is determined and when and how it changes. We therefore turn in a second section to the long-run theories of profits.

SHORT-RUN THEORIES

Given technology and the capital stock, the level of demand, and wages, there is an accounting identity relating profits and prices:

$$\Pi = pX - wL, \tag{1}$$

where Π is profits, p is price, X is sales or output, w is the rate of compensation per manhour, and L is manhours.[10] It has been customary—and for the most part fruitful—to concentrate the analysis on price behavior, allowing profits to be determined residually by equation (1).[11]

Modern econometric price theories run roughly as follows: Considerable evidence has accumulated that industrial firms tend to set prices as a markup on *normal* average costs. This is sometimes called the "normal-price hypothesis"[12]—"normal" signifying that a variable is cyclically corrected. Firms are assumed to produce output using current and overhead inputs with increasing returns in the short run. Sales in the short run are determined by price and cyclical conditions, as well as by many random factors. Faced with temporary changes in demand, firms generally alter production and employment rather than price. Prices are based on long-run profitability and other managerial objectives and are not significantly

10. Equation (1) is obviously oversimplified in omitting other fixed costs like interest and taxes, and other variable costs such as purchases of materials, which will be introduced below.

11. Much of the theory discussed in this section grew out of work with Wynne Godley of the Department of Applied Economics, University of Cambridge, England. An application of the theories is contained in William D. Nordhaus and Wynne Godley, "Pricing in the Trade Cycle," *Economic Journal*, Vol. 82 (September 1972), pp. 853–82. Further results will be presented in a forthcoming monograph.

12. See Nordhaus and Godley, "Pricing in the Trade Cycle," for a more precise discussion of the normal-price hypothesis.

adjusted to cyclical conditions. Thus from the firm's point of view, wage rates are set for contractual periods and prices are determined by long-run considerations, whereas labor inputs and production are lagged functions of sales. This view makes profits the residual factor.

While this statement seems a fair, if brief, representation of modern views on short-run industrial price setting, it glosses over some unresolved issues. First, although most of the empirical evidence supports the view that costs are "normalized," in the sense defined above, before they enter the firm's pricing decision, many analysts do not accept this view. A second and more difficult problem concerns the form of the markup equation: which costs are included in the base and which are excluded? In their early writing, Hall and Hitch stressed "full-cost pricing," which took into account both current and capital costs.[13] On the other hand, almost all empirical work has followed the lead of Kalecki, who included only prime costs (generally defined as costs that are variable in the short run—labor, materials, indirect taxes), and then calculated price as a markup over them.[14] Unless one accepts the Kalecki view of the pricing decision (which implies that firms behave as profit-maximizing monopolists), I see no compelling theoretical reason to use one specification rather than the other in estimating the short-run price and profit equations. In any case, the markup models seem to me somewhat dubious as long-run price equations; they imply that indirect taxes and materials costs cumulate in importance as they cascade through the system, and further that price is affected by such things as the level of aggregation of different sectors.

A third question, related to the second, concerns the shifting of direct taxes, such as the corporation income tax. Theoretical considerations argue that firms ignore changes in the level of direct taxes in making pricing decisions in the short run, and this practice would be assumed in the theories that take price as a markup over current costs. Full-cost theories are sometimes ambiguous on this question. The invariance to the level of direct taxation is another weakness of markup theories in explaining secular movements in price and profits. In the longer run, the markup over current

13. R. L. Hall and C. J. Hitch, "Price Theory and Business Behaviour," *Oxford Economic Papers*, No. 2 (May 1939), pp. 12–45.

14. Michal Kalecki, "The Distribution of the National Income," in Kalecki, *Essays in the Theory of Economic Fluctuations* (London: Allen and Unwin, 1939); Otto Eckstein, "A Theory of the Wage-Price Process in Modern Industry," *Review of Economic Studies*, Vol. 31 (October 1964), pp. 267–86.

costs would (other things equal) gradually drift up and down as the level of direct taxation rose and fell.

A final set of unanswered questions concerns the long-run decisions. Under what conditions does the markup change, and what is the relation between pricing and investment decisions? These are much harder questions and must be postponed to the next section.

ALTERNATIVE SPECIFICATIONS

Consider a firm that produces output (X) from labor inputs (L) and capital inputs (K). Let the subscript n represent normal, or cyclically corrected, values. The markup hypothesis assumes that

$$p = (1 + m)\left[\frac{wL_n}{X_n} + C\right] + v, \tag{2}$$

where p is price, m the cyclically invariant markup, v materials cost per unit output, w the wage rate, and C other costs that are included in a given specification. From the profits identity, profits before tax are given by:

$$\Pi = pX - wL - D - I - vX - zX, \tag{3}$$

where D is depreciation, I is interest payments, and z is the rate of indirect business taxation.

A "full-cost" variant of the markup hypothesis is target-return pricing. This assumes

$$p = \frac{wL_n + D + zX_n + vX_n + r_nK}{X_n}, \tag{4}$$

where r_n is the target or required return on capital and K is the value of capital.

To make operational the two normal-price hypotheses shown in equations (2) and (4) requires first normalizing the variables. The only difficult problem is to guess how producers form expectations about normal output, X_n. I assume that they simply project output from past trends and make a cyclical correction. Thus at every time t, the current and future path of X_n —for example, $X_n(t)$, $X_n(t + 1)$, . . .—is the prediction of a regression running over . . . $X(t - 1)$, $X(t)$. In the regression I used, log output entered as a quadratic function of time and the civilian unemployment rate. Thus a regression for the period 1948–73 gives the following:

$$\ln X = 5.54 + \underset{(76.1)}{0.0429t} + \underset{(2.7)}{0.00018t^2} - \underset{(11.3)}{0.035}\,(u - 4.77). \tag{5}$$

$\bar{R}^2 = 0.998$; standard error of estimate = 0.0169; Durbin-Watson statistic = 1.33.
The numbers in parentheses are *t*-statistics.

The term $(u - 4.77)$ is the deviation of the unemployment rate from its postwar average of 4.77 percent; $\ln X_n$ is simply the prediction of equation (5) when $u = 4.77$ percent.

Strictly speaking, I should have fit (5) for every year to calculate the best estimate of X_n. I tried a couple of these, but fortunately it didn't make much difference. Thus if I had run through 1965 rather than 1973, $X_n(1965)$ would have been about 1 percent higher. The stability of (5) over the postwar period means that X_n changes little from year to year with changes in the sample. For what it's worth, normal output for 1973 in 1958 prices was $507.4 billion, versus the actual figure of $512.2 billion.

The second variable that must be normalized is labor productivity. I have assumed that the logarithm of normal productivity is a quadratic function of time and of the deviation of output from its trend value.[15] The fitted equation was

$$\ln (X/L) = -5.49 + \underset{(71.1)}{0.0286t} + \underset{(2.1)}{0.00010t^2} + \underset{(3.9)}{0.226} \ln (X/X_n). \tag{6}$$

$\bar{R}^2 = 0.997$; standard error of estimate = 0.012; Durbin-Watson statistic = 1.40.
The numbers in parentheses are *t*-statistics.

For normal productivity (X_n/L_n) I use the prediction of this equation when output is at its normal level. Although productivity is not a primary concern of this paper, note that a slight acceleration shows up, contrary to my estimate of the underlying trend for the economy as a whole.[16] This conclusion implies that measured productivity growth in the noncorporate sector, along with sectoral shifts, is retarding the overall rate of productivity growth.

According to equation (6), normal productivity per manhour has been growing at about 3.2 percent annually over the last few years. There were notable exceptions, however. Normal productivity (that is, productivity corrected for capacity utilization but retaining the residuals) did poorly

15. The rationale for this form of equation was explored in William D. Nordhaus, "The Recent Productivity Slowdown," *BPEA* (3:1972), pp. 493–536. Note that the caveat about annually refitting (5) applies equally to (6).

16. Ibid., pp. 496–98.

from 1965 to 1967, growing at only 2.0 percent annually. On the other hand, 1971 was a very good year with normal productivity growing at 6 percent; and 1973 seems to have been right on target. The surprises in productivity may well have contributed to unexplained short-run movements for the years when the equation does poorly; but given the good fit of (6), the magnitude of unexplained movements is quite small.

A final problem involves the pesky inventory valuation adjustment. The price, sales, and output data that the Department of Commerce publishes use replacement-cost valuation. As noted above, most accounting techniques use historical cost (or average cost). Perhaps the *Wall Street Journal* exaggerated when it asserted that most businessmen have never heard of IVA;[17] it seems safer to assume that most of them base their actual calculations of prices, sales, and profits on historical cost, whatever their knowledge of IVA.

A simple example illustrates the problem. Suppose that a winery buys grape juice, ferments it for one year, and sells Chateau Monk wine; all valuation is based on historical cost. On average, the winery achieves $100 in profits on each $1,000 of sales, for a gross margin of 10 percent. However, depending on the rate of inflation, and the state of the wine business, the return in any given year will be different from this. In any year, part of the return will represent a genuine return to capital and part will represent capital gains on grape juice (and would therefore be taken out by the IVA). In other years, all of the $100 will represent genuine return to capital. Unless the winery were to do alternative calculations on a replacement-cost basis, it is unlikely to be aware of what fraction of any year's return was genuine and what fraction was simply capital gains. Why would our monk care as long as year in and year out he averages his desired rate of return?

This line of reasoning suggests that prices, sales, and profits should be calculated on a "businessman's basis"—or on historical cost—rather than on the "Commerce Department basis"—or replacement cost. To convert the published figures to the businessman's basis, the IVA (typically a negative number reflecting the fact that prices rise) is subtracted from gross product, and a new deflator is calculated as the ratio of (higher-valued) current-dollar to (unaffected) constant-dollar businessman's output. Profits are used on a "book value" basis, which is the businessman's basis

17. "Phantom Earnings: Because of Inflation, Profit Drop Is Deeper Than It Seems to Be," *Wall Street Journal*, March 12, 1974.

as defined above. This adjustment is equivalent to putting all concepts on a historical-cost basis. Accordingly, in what follows, this manner of constructing the data will be called the *historical-cost* basis.[18] The Commerce Department's concepts of profits, output, and price will be called the *replacement-cost* basis.

The next step in calculating normal profits was to calculate the predicted price series. Given the lack of theoretical or empirical guidance about the proper form of the equation, I tried six alternative specifications. They are described in Table 6.

For the most part the logic of the equations is self-evident. The only practical problem lies in the order for including the variables moving from the grossest markup equation, (1), to the target-return equation. The inclusion process starts with the most variable costs and then adds that item most likely to be treated as a fixed charge. Note that because all variables are based on value added, it is implicit that materials are *not* marked up as they pass through the firm.

Table 7 shows the markups and some summary statistics for the six specifications. The simple markup equations—specifications (1) and (2) in Table 6—clearly perform the best in this simple test. The specifications that include the capital account items—depreciation, interest—and even the target-return markup version fare quite poorly over the sample period.

Predicted profits ($\widehat{\Pi}_i$) can be determined residually from the price equation and the profits identity, simply by inserting $\hat{p}_i$ into equation (3) using actual output and costs:

$$\widehat{\Pi}_i = \hat{p}_i X - wL - I - zX - D. \tag{7}$$

The actual level of profits plus IVA and that implied by specification (1) of the normal-profits hypothesis are reported in Table 8. (Note that the statistics in this table use the familiar Commerce Department replacement-cost basis rather than the historical-cost basis used elsewhere in this paper.)

The postwar history of corporate profits comes out very clearly in the data of Table 8. Over most of the period, profits are quite predictable from knowledge of actual costs and *normal* unit labor costs. With the exception of an erratic movement during the Korean War, this relation tracks

18. The use of "historical cost" as a description is slightly inaccurate. Some corporations use techniques other than historical-cost valuation, although the majority still use historical cost. It would be more accurate to use the description "book value" rather than "historical cost."

Table 6. Alternative Specifications of Price-Profits Hypothesis[a]

Specification number and description	*Equation*
(1) Price marked up on normal unit labor cost	$\hat{p}_1 = (1 + m_1)\frac{wL_n}{X_n}$
(2) Price marked up on normal unit labor cost plus indirect taxes	$\hat{p}_2 = (1 + m_2)\left(\frac{wL_n}{X_n} + z\right)$
(3) Price marked up on normal unit labor cost plus indirect taxes plus normal depreciation	$\hat{p}_3 = (1 + m_3)\left(\frac{wL_n}{X_n} + z + \frac{D}{X_n}\right)$
(4) Price marked up on normal unit labor cost plus indirect taxes plus normal depreciation plus normal interest	$\hat{p}_4 = (1 + m_4)\left(\frac{wL_n}{X_n} + z + \frac{D}{X_n} + \frac{I}{X_n}\right)$
(5) Target-return pricing (I): price equals costs, plus a normal before-tax return on capital	$\hat{p}_5 = \frac{wL_n}{X_n} + z + \frac{D}{X_n} + r_n^b\frac{K}{X_n}$
(6) Target-return pricing (II): price equals cost plus direct taxes plus normal after-tax return on capital	$\hat{p}_6 = \frac{wL_n}{X_n} + z + \frac{D}{X_n} + \frac{r_n^a K}{(1-\tau)X_n}$

a. The variables are defined as follows:
p = deflator for gross product of nonfinancial corporations, historical-cost basis
$\hat{p}_i$ = predicted price in specification i, $i = 1, \ldots, 6$, historical-cost basis
$m_1, \ldots, m_4$ = markup
X = gross product of nonfinancial corporations, 1958 prices, historical-cost basis
w = compensation per manhour
(L_n/X_n) = normal labor inputs per unit output
z = indirect business taxes per unit of real output
D = economic depreciation, from Table 2, column (2), above
I = net interest
K = replacement cost of net stock of corporate capital, current prices
r_n^b = average before-tax rate of return on capital = 13.3 percent
r_n^a = average after-tax rate of return on capital = 7.1 percent
τ = effective corporate tax rate

Table 7. Residual Error in Alternative Specifications of Price-Profits Hypothesis

Specification	*Markup* (m_i)	*Standard deviation of* ($e = \hat{p}/p$)[a]	*Sum of squared errors of* ($e = \hat{p}/p$)[a]
1	1.55	0.0132	0.0044
2	1.36	0.0137	0.0047
3	1.21	0.0186	0.0086
4	1.19	0.0253	0.0160
5	1.00	0.0215	0.0113
6	1.00	0.0236	0.0136

Source: Table 6.
a. p = deflator for gross product of nonfinancial corporations; $\hat{p}$ = predicted price.

Table 8. Actual and Predicted Before-Tax Profits Plus Inventory Valuation Adjustment, Nonfinancial Corporations, 1948–73

Billions of dollars, replacement-cost basis

Year	*Actual profits and IVA*	*Predicted profits*	*Residual*
1948	29.6	25.7	3.9
1949	26.8	26.3	0.5
1950	33.5	28.0	5.5
1951	38.0	36.6	1.4
1952	34.8	36.3	−1.5
1953	33.9	38.1	−4.2
1954	31.8	36.4	−4.6
1955	40.3	42.3	−2.0
1956	39.1	38.1	1.0
1957	38.3	39.3	−1.0
1958	33.5	32.3	1.2
1959	42.8	41.8	1.0
1960	40.3	39.7	0.6
1961	40.3	38.1	2.2
1962	45.0	43.6	1.4
1963	48.6	46.8	1.8
1964	55.2	53.8	1.4
1965	64.1	60.9	3.2
1966	69.4	67.0	2.4
1967	65.1	60.7	4.4
1968	70.4	70.4	0.0
1969	62.1	66.6	−4.5
1970	50.7	54.8	−4.1
1971	59.2	69.8	−10.6
1972	67.3	74.1	−6.8
1973	79.3	83.0	−3.7

Sources: Actual profits and IVA are from the sources cited for Table 2. Predicted profits are from specification (1) of the price equation in Table 6, and from equation (7). Residual equals actual minus predicted.

well over the entire period from 1948 to 1968, especially in catching the *cyclical* movements in profits. However, after 1968, profits began to deteriorate and so did the ability of the equation to track them. By 1971 it was overpredicting them by $11 billion, or fully 18 percent.[19]

19. One of the weaknesses of the foregoing procedure is that the level of normal output must be inferred rather than observed. At the suggestion of Alan Greenspan, I substituted a measure of capacity utilization in both the normal-output equation, (5), and the productivity equation, (6). The quadratic terms in both equations were much smaller than in the previous version. When normal unit labor cost was constructed using the

It should be emphasized that the formulation of the price equation used here differs from the usual markup equation only in excluding the IVA—that is, only in calculating profits, value added, and price on historical rather than replacement cost of inventories. This minor change makes all the difference over the 1968–73 period. If exactly the same technique were followed using the Commerce Department rather than the businessman's convention, the residuals would differ as follows:

Year	*Residual using Commerce convention (replacement cost)*	*Residual using businessman's convention (historical cost)*
1968	−0.3	0.0
1969	−5.9	−4.5
1970	−7.8	−4.1
1971	−14.7	−10.6
1972	−10.5	−6.8
1973	−13.5	−3.7

The effect of putting all variables on the basis of historical cost essentially erases a good part of the post-1968 profit squeeze, with the sum of the businessman's residuals being about one-half that of the Commerce residuals. Moreover, by 1973 the businessman's technique puts profits after taxes only $4 billion below the prediction, compared with $14 billion for the Commerce technique. It appears very likely that "IVA illusion" constitutes a very large fraction of the current profit squeeze. When in Rome . . .

Several conclusions emerge from this discussion. First, the normal-profits hypothesis provides a good explanation of cyclical movements in profits and of their levels over most of the postwar period. The most satisfactory of the specifications over the 1948–73 period was one that assumes that prices are marked up over normal labor costs. The target-return price equations, either with or without shifting terms, performed considerably worse than the simple markup equations.

Second, the evidence for short-run shifting of corporate profits taxes is

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utilization series, the price forecast changed very little. Thus, under the specification using normal output, the actual 1973 price was 0.62 percent below the prediction, as against 0.63 for the utilization specification. In fact, for the post-1966 years, the utilization specification overpredicts profits more than the normal-output specification. Over the postwar period as a whole, the utilization specification has a standard error approximately 5 percent greater than that of the normal-output specification.

slightly unfavorable. Versions of the price and profit function that exclude any form of capital taxes or capital costs perform considerably better than those that include them. While this result is hardly conclusive, it does cast doubt on theories that indicate short-run shifting of corporate taxes through prices.

Finally, none of the specifications is able to account for the sag in profits since the mid-1960s. Though only the predictions of specification (1) are shown in Table 8, the other specifications perform worse over the last ten years. The post-1968 period remains a small puzzle. On the other hand, similar puzzles, with long runs of negative and positive residuals, appear in the earlier periods.

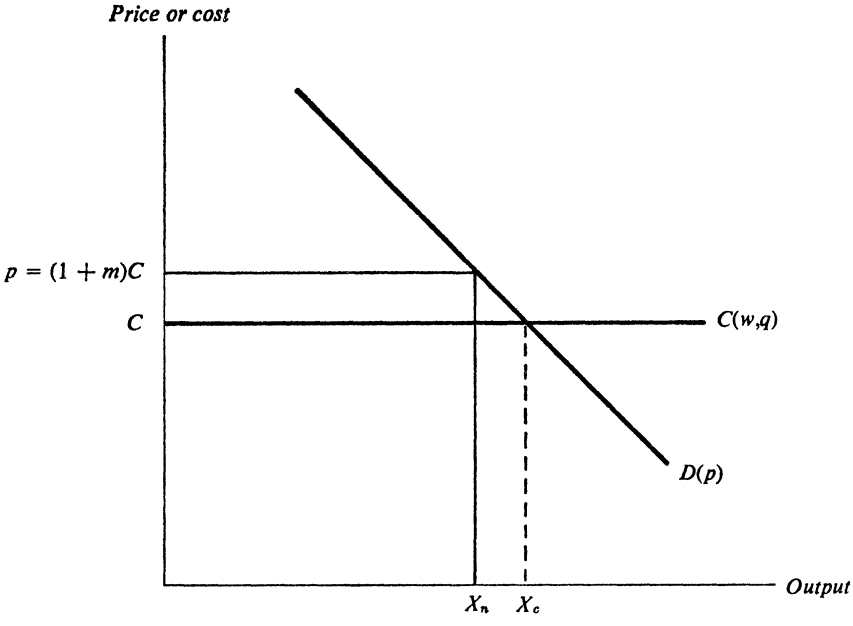
PROFITS IN THE LONGER RUN

The previous discussion demonstrates the difficulty of attempting to use simple markup models to explain the behavior of profits in recent years. I turn now to a different kind of perspective—one that integrates the pricing decision with those longer-term considerations of setting capacity, of capital-labor substitution, and of the "net" profitability of the corporate sector as a whole. Since long-period analysis is fraught with controversy over both concepts and techniques, I set out these remarks only as a tentative guide to the longer-term movement in profits.

I will consider three important long-run decisions confronting firms: setting capacity, the capital-labor ratio, and the price.

I assume firms are concerned with maximizing the value per share of equity. They are constrained on the one hand by demand relations, and on the other by production functions and factor costs. The representative firm is faced with a demand function that is a function of its price and aggregate output. Its production function is assumed to be constant returns to scale, and it takes factor prices—the rate of compensation (w) and the rental on capital (q)—as given. Given the production function, there is a dual cost function $C(w, q)$ that gives average cost (also normal cost in the terminology of the last section) as a function of the wage rate and the rental on capital. I have shown the demand function as $D(p)$ and the cost function as $C(w, q)$ in Figure 4. If price were competitively determined, it would settle at $C(w, q)$ and normal output would be X_c. If the industry has any market power or intangible property such as patents—which seems a fair bet for the corporate sector—then price would be set somewhat above $C(w, q)$ and

Figure 4. The Price-Capacity Relation to Profits



Source: See discussion in text.

there would be profits above the cost of capital, or "net profits" of the firm. If price is $(1 + m)$ times cost, as in Figure 4, then normal output will be somewhat below competitive output, say at X_n in Figure 4. The exact level of this markup m is determined by the average strength of competitive forces in the corporate sector.

Capacity will, of course, be set somewhat above normal output. Just how far above is determined in light of the level and variability of demand and the complicated structure of holding costs, short-run marginal costs, frequency and severity of machine failure, the possibility of backlogging orders, and so forth. If the surveys on capacity can be taken seriously, businessmen customarily prefer to have capacity about 7 percent above normal output.[20]

The final important decision is the capital-labor ratio. In the framework

20. See McGraw-Hill Publications Company, Economics Department, "Annual Survey of U.S. Business' Plans for New Plants and Equipment" (April 1973 and preceding annual issues).

set out here, this ratio is picked in such a way as to minimize normal costs, and is thus a function only of factor prices. In the long run, labor, as well as financial and physical capital, are all assumed to be very elastically supplied to the corporate sector. In what follows I distinguish between the "cost of capital"—roughly the interest rate on debt and equity that corporations must pay to raise financial capital; the "rental on capital"—the implicit annual dollar cost per unit of tangible capital; and the "rate of return"—the annual percentage income earned per dollar of net capital stock owned. The rental on capital is the relevant cost for the capital-labor decision; it is a function of both the price of capital goods, and the cost of capital—which is in turn determined by the "risk-free" real interest rate and the supply price of funds for risky equities.

I will return to a definition and justification of the various concepts. At this stage it suffices to say that the cost of capital is essentially a weighted average of the cost of debt and equity capital; and the rental on capital is the price of capital goods times the sum of the real before-tax cost of capital and the depreciation rate on corporate capital.

To be more specific, I assume that normal output is produced according to a production function characterized by constant elasticity of substitution (CES). The rate of labor-augmenting technological change is assumed to exceed the rate of capital-augmenting technological change by the rate g. The production function for normal output can be written as

$$X_n = A\{dK^{-b} + (1 - d)[L_n \exp(gt)]^{-b}\}^{-1/b}; \tag{8}$$

here, A and d are inessential parameters.

Cyclical demand for labor is given by

$$\frac{L}{L_n} = \left(\frac{X}{X_n}\right)^h, \; X \leqq \bar{X}, \tag{9}$$

where $\bar{X}$ is capacity output.

From (8), the cost-minimizing normal capital-labor ratio is given by

$$\ln(K/L_n) = \text{constant} + \sigma \ln(w/q) + (1 - \sigma)gt; \tag{10}$$

here, $\sigma = 1/(1 + b)$, where b is found in equation (8).
Adding the cyclical correction yields the observed cost-minimizing capital-labor ratio:

$$\ln(K/L_n) = c' + \sigma(w/q) + (1 - \sigma)gt - h \ln(X/X_n). \tag{11}$$

For given output, (11) also defines the equilibrium or normal gross factor shares (qK/wL_n) as a function of factor costs.

Given the cost-minimizing capital-labor ratio, the next decision involves the setting of capacity. I assume that capacity output ($\bar{X}$) is set so that normal output is some fraction $1/(1+f)$ of capacity:

$$\bar{X} = (1+f)X_n. \tag{12}$$

The ratio $\dot{X}_n/\bar{X}$ is customarily set at around 93 percent for manufacturing; nor has it changed much since the late sixties. Equation (12) is added for logical completeness, but it is not needed in the estimation that follows.

Finally, the average cost of output can be calculated. If ρ is the after-tax cost of capital, then average total normal historical cost, C, is given by

$$C \equiv \frac{wL_n}{X_n} + \frac{\rho K}{(1-\tau)X_n} + z + \frac{D}{X_n}, \tag{13}$$

where τ is the effective tax rate on capital income, z is the rate of indirect business taxes, and D is economic depreciation. Equation (13) differs from specifications (5) and (6) of the price equation in Table 6 in that (13) uses the *current* cost of capital in calculating cost while those specifications use a fixed target rate of return. Another route, which I have not followed, would be to derive the cost function explicitly from (8) and to use this rather than historical factor supplies in (13).

Finally, price is assumed to be a fraction $(1+m)$ of average cost:

$$p = (1+m)C. \tag{14}$$

The relationship between average total normal cost and price (both on the historical basis) is shown in Figure 5. I have estimated the share equation (11) and the price equation (14) over the postwar period. In what follows, all concepts will be on the historical-cost basis.

The estimated share equation (11a) shows how the capital-labor ratio varies with changes in factor prices.

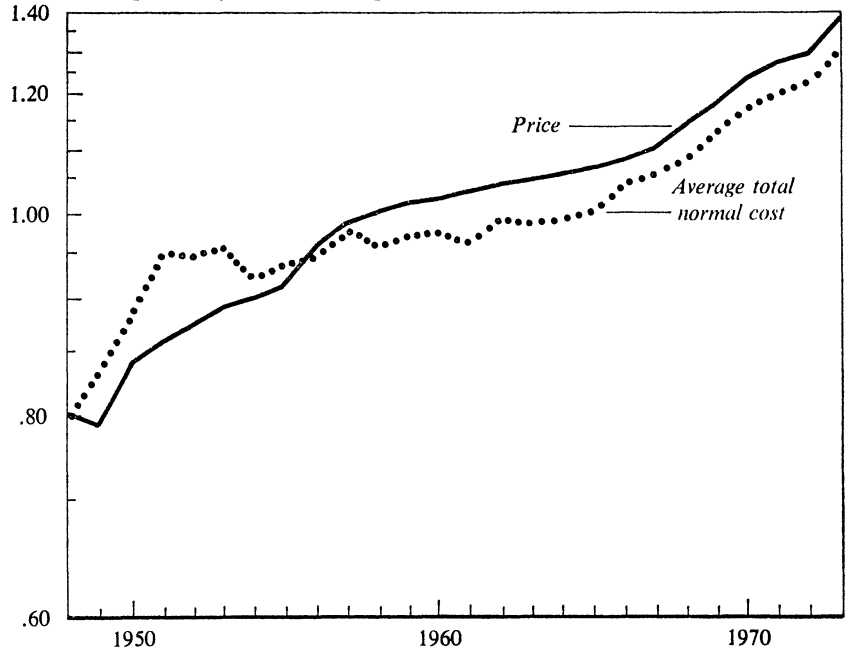
$$\ln(K/L) = \underset{(0.053)}{-5.30} + \underset{(0.0029)}{0.0216}\ln(w/q) + 0.0250t - \underset{(0.094)}{0.686}\ln(X/X_n). \tag{11a}$$

$\bar{R}^2 = 0.9992$; standard error of estimate = 0.0122;
Durbin-Watson statistic = 1.68; first-order correlation coefficient = 0.895.
The numbers in parentheses are standard errors.

According to the share equation, normal factor proportions shift very little after a change in relative factor costs. The estimated elasticity of substitution is 0.02, a number that seems implausibly low by comparison with

Figure 5. Relation of Prices and Average Total Normal Cost, Nonfinancial Corporations, Historical-Cost Basis, 1948–73

Price or cost per unit of 1958-dollar output (semi-log scale)



Source: Price equation discussed in the text.

those most other studies have found. On the other hand, in the absence of serious specification error, the small standard error rules out very big elasticities. A t-test of the null Cobb-Douglas hypothesis ($\sigma = 1$) has a value of 18.

The specification of the share equation differs from that in other studies of the elasticity of substitution, most of which rely either on cross-sectional estimates or on equations relating average labor productivity to factor costs. Also, note that the share equation includes inventories as well as fixed capital; and, finally, that the capital costs are average (or effective) costs rather than the more appropriate marginal cost of capital.

The implications of the low elasticity are striking. As the rental on capital falls (for reasons to be explored below) the normal capital-labor ratio responds modestly. Thus, when the cost of capital fell sharply in the early postwar period, taking the rental on capital along with it, both the net and

the gross shares of capital declined. The movement in capital's share in the 1960s has a different explanation. During this period the effective tax rate on corporations fell sharply while the after-tax cost of capital held roughly constant. In this situation a low elasticity of substitution implies that the net share of capital would return to the level it held before the tax change. The gross share (inclusive of taxes) would decline with the tax burden.

As long as the elasticity of substitution is less than unity, the direction of the movement in shares will be the same as described above, although the quantitative magnitudes would be attenuated. A zero elasticity means that the gross share of capital moves exactly proportionally with the ratio of the gross rental to wages. A more moderate value of the elasticity would suggest some capital-labor substitution and therefore a less than proportional drop in capital's gross share. One might, for example, set the elasticity of substitution at an a priori level and ask how far off track the share currently is. To test out this idea, I set the elasticity at one-half and reran the shares equation. Obviously the in-sample fit deteriorated considerably, with the standard error of estimate rising from 0.012 to 0.027. Moreover, the last few years saw very large prediction errors, with the actual share below the predicted share by an average of 5 percent over the last two years. This compares with an overprediction of 1 percent for equation (11a) as estimated above. These results confirm the impression that the low elasticity plays a leading role in the tale of the falling share of capital.

The estimated price equation, (14a), is also surprising:

$$\text{(14a)}\quad \left(\frac{p}{C} - (1+m)\right) = \underset{(0.179)}{0.753}\left(\frac{p}{C} - (1+m)\right)_{-1} + \underset{(0.181)}{0.149}\left(\frac{p}{C} - (1+m)\right)_{-2},$$

where

$$(1+m) = \underset{(0.056)}{0.059};$$

$\bar{R}^2 = 0.843$; standard error of estimate = 0.0199;
Durbin-Watson statistic = 1.94.
The numbers in parentheses are standard errors.

Perhaps the most interesting result is that the markup over total cost, m, is about 6 percent, although this coefficient is not well determined: the estimate for the markup in equation (14a) is 0.059 with a standard error of 0.056. (The term $(1 + m)$ enters nonlinearly, and this accounts for the

unusual presentation of the results in equation (14a) above.) The pattern of adjustment of the markup is less satisfactory. The equation is essentially a damped second-order difference equation.

Again, interpreting the actual movements of profits in the light of those predicted by the movement of average cost proves an enlightening exercise. (Note that profits are on an historical- rather than a replacement-cost basis.) The decline in the share and rate of return of capital from 1948 to the mid-1950s is entirely consistent with movements in average cost. By this explanation, price was at about the right level in the mid-1950s. Starting about 1958, price moved to about 5 percent above average cost; from 1958 to 1973 it remained there on the average, within a range of 4 percent and 7 percent above cost. According to this explanation, there has been no profit squeeze in the last few years. In the best specification of the markup equation, price rose 1.2 percent less than predicted from 1966 to 1973. If price is compared with average total normal cost, it can be seen that price actually rose 0.8 percent more than total cost over the period.

Another way of viewing the profits picture is to compare the average rate of return on capital with its cost. Over the entire 1948–73 period corporate capital earned an average of 7.1 percent after taxes, while the average cost of capital was 6.5 percent. After 1958, the differential was somewhat wider, averaging 1.9 percentage points. During the recent "profit squeeze," the gap has averaged 1.7 percentage points.

The meaning of this meager differential is not clear. What is clear is that, taking the postwar period as a whole, the corporate sector has experienced essentially no "net" profitability. This is a most surprising result, given popular notions about monopoly power, and the undoubted existence of supernormal returns to major inventions and knowhow.

WHY HAS THE COST OF CAPITAL FALLEN?

I have indicated that most of the puzzle about the profits share is explicable by the more or less continuous fall in the cost of capital. This section elaborates on the concept of the cost of capital and suggests some tentative hypotheses about its decline over the postwar period.

A formal definition of the cost of capital rests on the way the costs of debt and equity are combined in the analysis. In a world with neither transactions costs nor taxes, capital would cost the same whether its source

were debt, equity, or retained earnings. In the real world of corporation and income taxes, debt financing is more advantageous than equity financing, for low levels of debt. But debt financing becomes relatively costly as the probability of bankruptcy rises. Assuming firms set the debt-equity ratio so as to maximize the price per share of equity, the optimal ratio will come at the point at which the probability of bankruptcy outweighs the gains from further debt financing. I assume that the subjective probability distribution on the rate of return determines the optimal ratio of debt to total financing, say d^*. Several factors will influence d^* over time, but the most important is probably the perceived riskiness of investment in tangible capital. As investment looked safer over the postwar period, one would predict that d^* would increase—as indeed it did.

In principle, it would be desirable to calculate the marginal cost of capital and compare it with the marginal return on capital. In practice, one must settle for calculations of the average cost and return. Assuming that prices are expected to rise at rate π in the future, the real cost of capital, ρ (before personal tax but after corporate tax), is given by

$$\rho = (r_b - \pi)d^*(1 - \tau) + r_e(1 - d^*), \tag{15}$$

where r_b is the interest rate on bonds, τ is the effective tax rate on profits (genuine capital income before taxes less interest), and r_e is the rate of return on equities, here taken to be the normal earnings-price ratio on equities.

The calculation of the real cost of capital is a complicated problem, and I will only summarize the steps. The interest rate on bonds is taken to be a "risk-free" rate. Given the thinness of the long-term government market, I have therefore used Standard and Poor's Aaa rate. The rate of return on equities, r_e, is taken to be Standard and Poor's dividend yield corrected for the ratio of genuine income after tax less interest (from Table 3) to dividends. The share of debt in total financing is the ratio of net debt (from the flow of funds accounts of the Federal Reserve) to the replacement cost of total tangibles. The corporate tax rate is the effective tax rate on profits after the depreciation adjustment is made. Finally, the expected rate of increase of capital goods prices is the prediction imputed to an investor with rational expectations and a first-order autoregressive equation in the rate of increase of capital goods prices.

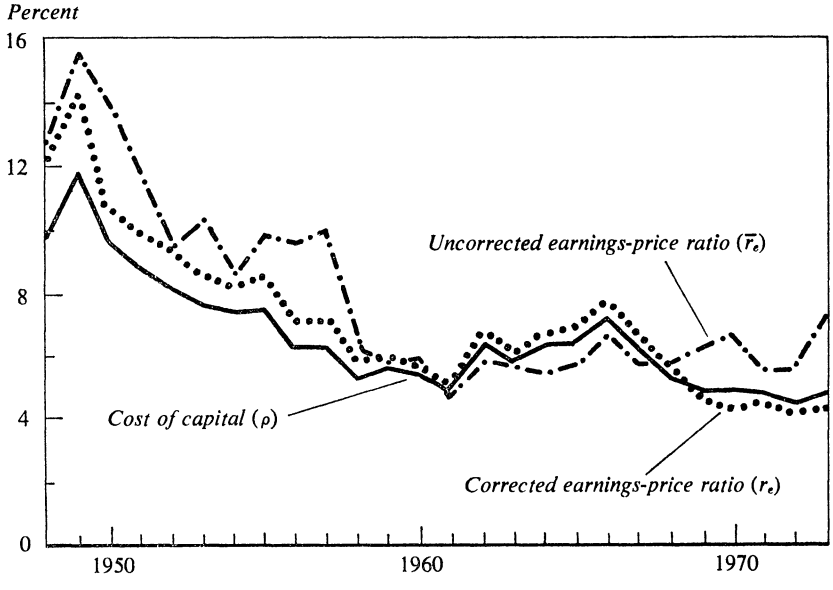
As it turns out, all these fancy corrections do not make much difference.

Figure 6 shows that the simplest form of the cost of capital one might want to use—the uncorrected earnings-price ratio $\bar{r}_e$—moves along with the more complete calculation given in equation (15).

Figure 6 clearly reveals the considerable decline in the cost of capital over the last twenty years. Most of the decline occurred in the early years, from 11 percent in the 1948–50 period to 5 percent in the late 1950s; since that time the cost has wobbled between 4 and 7 percent. The only other important factor was the rise of ρ relative to r_e, also shown in Figure 6. This change was due mainly to the increase in the rate of interest over the period. By 1973, the real average cost of debt was roughly equal to the cost of equity—3.8 percent compared with 4.1 percent, according to my calculation.

What explains the dramatic fall in the cost of capital? The answer seems to me to lie in the general economic climate and in the gradual dissipation of the fear of a new Great Depression. For many years after the crash, investors justifiably worried about a repetition of those events. Even as late as March 1955, when the fear might reasonably have faded, the state-

Figure 6. Cost of Capital and Earnings-Price Ratio in the Nonfinancial Corporate Sector, 1948–73



Source: Derived from text equation (15).

ment by Professor Galbraith that the Great Crash *could* repeat itself was sufficient to send the market into a temporary panic—or so he claims.[21]

Since that time, however, the memory of the bad old days has dimmed; and this freedom from fear may well provide a rationale for the postwar movement in the cost of capital. To breathe content into this proposition, I will assume that the holders of securities are risk-averse maximizers of expected utility. For simplicity, assume that the preferences of security holders can be represented by a utility function with constant elasticity β (or constant relative risk aversion, $\beta - 1$) in total consumption, with utility independent over time. Further assume that investors allocate their wealth over bonds and a risky mutual fund of equities of all corporations. The corporate sector owns the fraction k of the economy's wealth; the rest is perfectly safe government debt and risky noncorporate capital. Finally, the real rate of return on bonds is $(i - \pi)$ and the real rate on unlevered equities is ρ with a subjective normal distribution with mean $\bar{\rho}$ and standard deviation s. Under these conditions it can be shown (ignoring all moments above the second) that the investor divides his portfolio in fixed proportions between bonds and unlevered equities in such a way that

$$\bar{\rho} = i - \pi + \frac{2\bar{R}k(1 - \beta)s^2}{2\bar{R}^2 + (1 - \beta)(2 - \beta)k^2s^2}.$$

Here $\bar{\rho}$ is then the equilibrium cost of capital when the portfolio is allocated so as to maximize the expected utility, and $\bar{R} = [k\bar{\rho} + (1 - k)(i - \pi)]^{\beta-1}$. For a small s^2, or β near zero (more precisely, with percent error of $100(\beta - 1)(\beta - 2)\lambda^2s^2/2\bar{R}^2$), or in continuous time, this can be approximated as

$$\bar{\rho} = i - \pi + \frac{(1 - \beta)s^2k}{\bar{R}}. \tag{16}$$

It is most convenient to interpret (16) as the risk premium on unlevered equities required to induce security holders to hold a fraction k of their portfolios in that form, given their relative risk aversion ($\beta - 1$) and their perception of the variance as s^2.

To simplify the analysis I assume that $k(1 - \beta)/\bar{R}$ is constant for the postwar period. The main difficulty in applying (16) is that there is no good way to guess the subjective uncertainty in the investor's mind about the

21. John Kenneth Galbraith, *The Great Crash, 1929* (2d ed., Houghton Mifflin, 1961), p. xiv.

rate of return on equities. As a start, I calculated the one-year market yield to holding equities (dividend yield plus capital gains), r_m, going back to 1910. It came as no surprise that r_m experienced much greater swings in the prewar period than in the last twenty years. To get a more precise measure of the movement in the market yield, I calculated a series of twenty-year moving variances of r_m over this period, reported in Table 9; over the postwar years the variance declined to a quarter of its 1945 value. To convert these observed variances to the variance of unlevered equities, the calculated variance is divided by $(1 - d^*)^2$, where d^* is again the ratio of net debt to the replacement cost of tangibles.

A moving twenty-year variance may not adequately reflect the extent to which wide swings occurred over 1925–45. This set of weights implies that when Professor Galbraith frightened Wall Street in 1955, depresso-phobia was about half its intensity in 1945; it further assumes that no trace remained by 1973.

The estimate of this equation for 1948 to 1973 is

$$(17) \qquad (\rho - i + \pi) = \underset{(0.13)}{1.81}\, s^2,$$

$\bar{R}^2 = 0.724$; standard error of estimate = 0.026; Durbin-Watson statistic = 0.69.
The number in parentheses is a standard error.

which catches the general downward movement in the risk premium. The estimate of $(1 - \beta)k/\bar{R}$ is 1.8 for the postwar period. To convert this to an estimate of $(1 - \beta)$ requires calculating the value of k. The shares of corporate and noncorporate tangibles in total net national wealth for 1960

Table 9. Twenty-Year Moving Variance of the One-Year Market Yield on Equities, 1925–73

Period	*Variance of market yield*
1925–45	0.0570
1930–50	0.0496
1935–55	0.0304
1940–60	0.0205
1945–65	0.0145
1950–70	0.0160
1953–73	0.0146

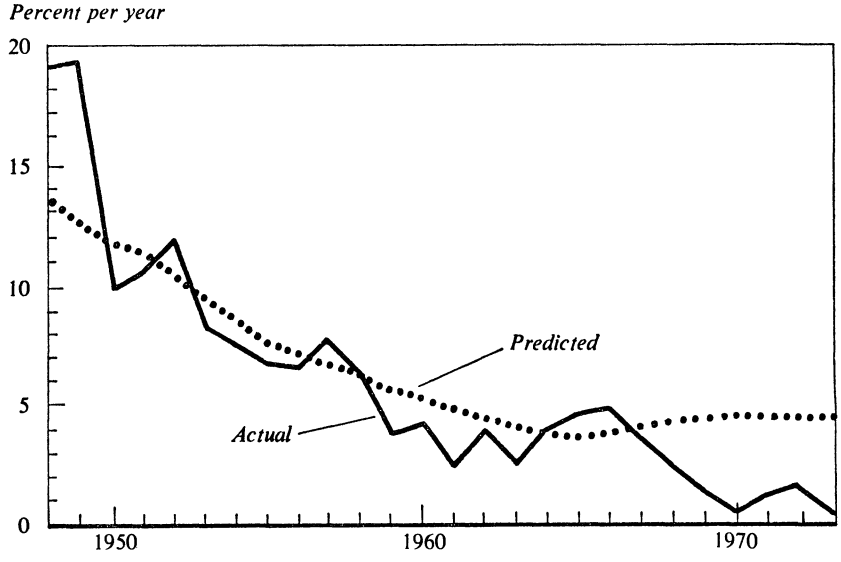
Source: Calculated from U.S. Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1957* (1960), p. 656, and *Survey of Current Business*, relevant issues. One-year market yield equals dividends plus capital gains for the year on equities held.

were 0.2 and 0.7, respectively; the correlation between corporate capital income and other property income is 0.5 over the postwar period. If other capital is as risky as corporate capital, this suggests a value of $k = 0.65$ as appropriate in calculating $(1 - \beta)$, so $(1 - \beta) = 3$ and β is estimated to be approximately -2.

Figure 7 depicts the predicted and actual movements in the risk premium over the postwar period. According to equation (17) the actual risk premium has been below the calculated premium since 1968. For 1973 the predicted level of the risk premium—predicted from equation (17), given the estimated riskiness of portfolio investment—was 4.4 percent, while the actual premium was only 0.4 percent. By historical standards a risk premium of equities over bonds of only one-half percent seems very small; it suggests either that tastes have changed or that stock prices in 1973 were too high by historical standards.

Are there any explanations for the low level of the risk premium? In the first place, investors may be displaying "IVA illusion" in much the same way businessmen do when they make price decisions. Recall from Table 3 that IVA was 35 percent of genuine capital income after tax in 1973. IVA

Figure 7. Relation of Actual and Predicted Risk Premium on Equities, 1948–73



Sources: Actual, *Survey of Current Business*, relevant issues; predicted, text equation (17).

illusion would make the yield on equities (and thus the risk premium) appear considerably higher than it in fact is. A second factor is that the market may be anticipating a higher inflation rate than the autoregressive model. The latter predicts 4.1 percent for 1973 and 4.5 percent for 1974. Combining IVA illusion with an anticipated long-run rate of inflation of 7 percent would give a perceived risk premium of 4 percent—rather than 0.4 percent—which is much closer to the historical norm.

The decline in the stock market since 1973 has already led to some improvement in the risk premium as calculated by equation (17). As of May 1974, the risk premium stands at about 1.0 percent.

The outlook for the cost of capital (as well as for capital's share) depends on future movements in the risk premium, among other things. Has the risk premium settled down to a more or less permanent level, or is it likely to change?

According to the model developed earlier in this paper, the major source of shifts in the rate of profit is cyclical movements arising from fluctuations in aggregate demand. It is commonplace to argue that Keynesian thought has so revolutionalized economic management that episodes like the Great Depression are obsolete, and that with competent economic management the record of the 1960s can be the norm. Put differently, the improvement in the techniques of macroeconomic management over the last forty years has brought significant reductions in the normal fluctuations in demand—and therefore in profits. The decline in the calculated variances is thus no accident. Until a further revolution in society or in economic management renders the Keynesian revolution obsolete, fluctuations in profits are likely to continue at the relatively low levels experienced over the last fifteen years.

If this view is correct, there may be a relatively small decline in the risk premium (and therefore in the cost of capital) as the last victims of crash pessimism die away. But, barring a change in preference toward risk or temporary fluctuations, the risk premium and cost of capital experienced over the last few years appear to represent a portfolio equilibrium.

Recapitulation

The basic facts of this rather complicated argument are not in dispute. Over the postwar period the share of measured profits has declined in a dramatic way. Even after a number of corrections to obtain a conceptually

cleaner definition and to adjust for cyclical factors, the share of net capital income in net corporate income shows a drop, albeit one less striking than the uncorrected figures display. I also calculated data on the rates of return on corporate capital, which revealed a roughly similar pattern.

A first attempt to explain the movement used six hypotheses on price and profit formation in the corporate sector. These indicated that price equations that used a markup on current costs performed considerably better than those including capital items. The preferred equation—with price marked up over indirect taxes and normal unit labor costs—was quite successful in predicting cyclical movements in profits; but it did poorly in predicting the secular decline in the share of profits. In the six-year period 1968–73, all six equations consistently overpredicted profits, in a range from 7 percent to 27 percent.

A second type of explanation embedded the price equation in a longer-run model. In this perspective, the markup of price over current costs is adjusted upward or downward depending on the net profitability of the corporate sector as a whole. In this view, the normal capital-labor ratio is determined by relative rental on capital and labor. The results of the longer-run model were surprising. First, over the postwar period, sizable changes in the wage-rental ratio induced very little capital-labor substitution. As a result, the decline in the rental of capital relative to the wage rate over the period led to relatively little substitution of capital for labor and thus to a decline in capital's share.

A second surprising conclusion was the absence of "net" profitability in the corporate sector during this period; that is, price was just sufficient to cover all costs including the cost of capital. What happened to all the oligopoly profits earned by automobile and steel companies, and where were the rents to important inventions earned by computer, electronics, and other high-technology firms? The conclusion must be that whatever supernormal and monopoly profits or returns to technology accrued were offset by inefficient firms or perhaps by firms concerned with "managerial" objectives and nonprice competition. Interestingly enough, the great merger movement of the sixties does not appear to have driven out or scared enough managerial firms to raise the net profitability of the corporate sector.

I conclude that the decline in capital's share was genuine, and that the main reason for this phenomenon was the fall in the cost of capital. One reason for this fall was the decline in the overall burden of taxation on corporations. According to my calculation the tax rate on genuine capital

income fell from a high of 61 percent in 1951 to a low of 38 percent in 1967. A second reason for the fall was the decline in the rate of return on equities, or the earnings-price ratio of corporations. I believe that this fall, in turn, was due chiefly to the dissipation of fear of another Great Depression and the consequent effect on the risk premium on equities. The combination of lower taxes and lower rates of return on equities led to a decline in the before-tax cost of capital of about 55 percent from the 1948–51 period to the late 1960s.

This view provides a relatively straightforward interpretation of the behavior of equity prices. These prices are determined by three factors: the rate of return on equities, the effective tax burden on corporations, and the before-tax rate of return on capital. The postwar history of stock prices falls into three periods: 1948–55, 1955–65, and 1965–73. The real price of equities changed by annual averages of +13.1, +7.0, and −0.2 percent, respectively, during these periods. The first period saw extraordinary capital gains because of the sharp decline in the rate of return on equities. In the second, the before-tax rate of return on equities was stable, but the sharply lowered tax rate fostered high capital gains. Since 1965, all three factors have been unfavorable. The combination of higher corporate taxes due to inflation, a sharp drop in the before-tax return, and a moderate rise in the rate of return on equities wiped out any real gains in equity prices. What would the normal pattern look like? Real capital gains on corporate equities generally should be equal to the retention rate (or one minus the "genuine" dividend payout rate) times the real after-tax rate of return. The payout rate has averaged 78 percent over the last five years, while the normal profit rate has averaged about 6 percent. Thus, year in and year out one would expect a real capital gain of about 1.3 percent. The average since 1948 has been 6.0 percent.

If the interpretation presented here is correct, what of the future? The first consideration is the effect on growth of potential output. The main implication of this analysis is that the extent to which monetary and fiscal policy can affect the rate of capital deepening has been overestimated. In the early 1960s, a number of measures were taken to promote growth by lowering the before-tax rental on capital. According to the share equation, these had little effect on the capital-labor ratio. Thus from the mid-fifties to the mid-sixties, the before-tax cost of capital fell by about 25 percent, while the capital-labor ratio grew by 28 percent, a rate imperceptibly higher than the postwar average. The main consequence of the fiscal measures designed to foster more rapid growth was to lower the gross return to capi-

tal and the share of capital. If the relationship were to hold for the future, measures designed to spur growth through lowering the cost of capital appear likely to have a high cost-benefit ratio.

A second important consequence of the falling share of capital is the effect on the distribution of income. Roughly speaking, for given distributions of wealth and labor, a decline in the net share of capital will be highly egalitarian in its effect. The general downtrend in capital's share should, then, be accompanied by a similar movement in measures of inequality. And, indeed, a sharp decline occurred in the before-tax share of the top income recipients during the period 1947–60, followed by virtual stability. In fact, since the income concept in these studies is "nominal income" rather than "genuine income," there probably has been a slight downward trend in the genuine share of top income recipients since the profit sag of the mid-sixties. The view taken above suggests that (without further changes in the tax structure or in the general macroeconomic climate) capital's share will not deteriorate further; if this is so, we have gotten the last egalitarian thrust from the declining share of capital.

Finally, what does the declining share of profits portend for inflation? Under some explanations for the squeeze, corporations are just waiting for a chance to recapture the gross margins of the mid-sixties. Thus if corporations were to regain their 1966 share of GNP, the GNP deflator would rise 3 percent, or the deflator for corporate output would rise 5.5 percent. According to this view, complete lifting of the price controls at the end of April 1974 might lead to one of the most hair-raising inflations in recent history.

According to the results of the current paper, a catch-up of prices of such a magnitude seems quite implausible. Energy prices aside, if overall movements of the cost of capital and IVA illusion are taken into account, on a historical-cost basis corporate prices appear to be pretty much in line by postwar standards. On the other hand, if the $31 billion IVA for the first quarter of 1974 is accurate, a huge bulge in historical costs is waiting to be passed through into final goods prices. If all but $10 billion of the $31 billion IVA is passed into final prices, one would expect a rise in the corporate deflator of slightly more than 2.5 percent. The pass-through of the IVA will leave the profits share and rate of return at their levels of the last few years. The possibility of recovering the profit margins of the mid-1960s (outside of the energy sector) seems quite implausible to me.

In sum, there seems little reason to think that profits are badly out of

line with historical experience. Since 1958, price has averaged 5.0 percent above average total cost as calculated in equation (13). In 1973 price was 4.3 percent above average total cost. Put differently, over the entire postwar period, the after-tax rate of profit averaged 0.7 percent more than the cost of capital; in 1973 this figure was also 0.7 percent.

The long-run outlook for the share of profits depends, of course, on future tax measures as well as on the general health and quality of management of the economy. If there are no fundamental changes, I expect that the normal share of corporate profits before tax (as measured by the Commerce Department and including the IVA and financial firms) will be around 8½ percent of GNP; and that the real after-tax rate of return on corporate capital will be around 6 percent.

Comments and Discussion

Nicholas Kaldor: This is a most impressive paper. I am gratified that it follows some lines of thought that we have developed in Cambridge. So if I make a number of criticisms I hope it is understood that they do not detract from my very high respect for the paper.

Nordhaus uses a model of market structure in which prices are determined by some sort of full-cost pricing or markup. I think this is a realistic model for the price leaders in oligopolistic industries, but not for all firms. For most firms, prices are given by the market, and these determine the margin of profit they can attain on total cost. Firms take what they can get.

I am not familiar with the evidence for the United States, but in the United Kingdom there is a very wide dispersion among firms in the rate of return on capital or on sales. As a result, a marked fall in the margin of profit in the aggregate does not necessarily mean any change in the desired markup or the realized return of those firms that do determine prices. There may instead have been a change in the relationship of costs between price leaders and price followers. And the price leaders may not even be situated inside the country. I wouldn't be surprised if Sony in Japan were the price leader for color television sets throughout the world. In other words, the fall in the profit rate may reflect external influences.

In analyzing firms' financing decisions, I think it is incorrect to view internal and external finance as close substitutes for one another. We know that firms stick pretty closely to a fixed retention ratio. They do not respond to small changes in the cost of capital by switching from one type of financing to the other—for example, by raising substantial new equity capital in place of financing through plowed-back profits. In all countries, including the United States, equity capital finances an insignificant portion of the total financial requirements of industry. Borrowing is quantitatively far more important. But clearly the latter is in the

nature of "matching finance." A firm cannot expand its borrowing much unless its collateral grows as well.

As Nordhaus says, taking account of risk, firms have a certain optimum debt-asset ratio. Thus, internal financing through plowed-back profits and external financing through loans and bonds are complementary to each other and not competitive. But this means that, as long as the internal rate of return is higher than the cost of borrowing, external costs can be ignored in determining the rate of return.

What, then, determines the rate of return? What is the advantage of price leadership? Firms aim at maximizing growth as a way of maximizing the present value of equity. Price leadership allows a firm to obtain the rate of profit that supports the increase in its own reserves at the rate required by its own optimum growth path.

If the price leader expects to grow at a 5 percent rate, and plows back 50 percent of its after-tax profits and distributes 50 percent, it would aim at a 10 percent target rate of return. But if its growth rate is 10 percent, its target rate of return will have to be 20 percent if it is to keep on growing without financial embarrassment at any stage.

I do feel that the observed fall in profits has to be explained. But I do not think that the correlation between the cost of capital and the internal rate of return to capital proves that the fall in the rate of return on business investment can be explained by the fall in the cost of capital (as represented by a weighted average of bond yields and equity yields); and I feel that the correlation between them shown by Nordhaus must be susceptible to some other explanation.

Alan Greenspan: This is a most interesting paper and Nordhaus is to be congratulated for his imaginative approach to a difficult problem, but I do have trouble with this type of paper. The trouble I have is that it offers no way of testing the sensitivity of the conclusions either to the specific data that are used and the adjustments made to them or to the particular specifications of the model. For example, I cannot judge the significance of assuming a constant value for the technology coefficient in the long-run production function, equation (8), or the constant risk-aversion factor that is assumed in the portfolio model, equation (16). Also, risk is identified with variance in only a limited way and a model equating the two may be quite inadequate. Details aside, Nordhaus does identify a real development—that the cost of equity capital has come down over the postwar period and

that this movement reflects, in part at least, a decline in the uncertainty of economic performance. But I have little confidence that his specific model can predict where the cost of capital goes from here.

The simple autoregressive proxy for the price expectations variable also seems deficient: inflation premiums in interest rates are very important at present, so just what those expectations are is critical to Nordhaus' analysis. The price expectations projected here do not quite square with what is now going on.

I also have doubts about the way the Commerce Department's estimates of capital stock are used here. These numbers certainly provide a valuable data base, but they do not meet the needs at hand. In constructing the stock estimates, Gorman uses a perpetual inventory concept which embodies a fixed retirement schedule for a particular cohort of capital expenditures. This convention insulates the capital stock estimates from responses to an investment tax credit or a reduction in the corporate tax rate—both of which shift the investment function and thereby accelerate the retirement patterns. Gorman's figures on retirements often differ significantly from the actual figures on the balance sheets and income statements of corporations. Nordhaus' low estimate of the elasticity of substitution between capital and labor may result simply from inaccurate data.

To return to estimating the risk premium, it would be useful to include the period before World War II, when profit margins fluctuated significantly. During the postwar period covered by the paper, risk persistently declined, as Nordhaus measures it, and I cannot have much confidence in the relation of risk to shares judged from this unidirectional move.

The paper makes some useful adjustments to the usual concepts of income; but one might want to make still other adjustments. If all inputs are priced at replacement cost, capital gains are a good deal larger than the inventory valuation adjustment alone. Furthermore, gains also arise from the liabilities side to the extent that current borrowing costs are greater than costs of older debt already on the books. With interest rates generally rising throughout the postwar period, this effect would be sizable and even Nordhaus' genuine income measure would be too high.

Nordhaus' finding with respect to the IVA is extremely interesting. If product pricing is independent of the historical cost of inputs, then inventory profits can be treated as independent of other income. But Nordhaus' findings indicate that this is not the case, and there is direct evidence

from business practice to support them. Many pricing decisions are made directly off the cost of materials. For example, cotton textiles are commonly priced for point of sale. A firm committing to sell cotton cloth three months hence fixes its sales price in terms of today's cotton price. Cotton is purchased in the futures market so that total profits three months hence are locked in. However, the part of the total that is inventory profit is indeterminate; that depends on the trend of cotton prices on the spot market over the three-month contracting period.

In conclusion, I have some uncertainties about the future as Nordhaus' model would predict it. Even if I agreed with his picture of what has moved risk premiums in the past, I would not be comfortable projecting that risk premiums will remain low. Those premiums reflect the degree of certainty about the future stream of cash flows. And uncertainty could rise over the next decade for many reasons, including requirements to reinvest earnings for pollution control purposes and other restrictions on the use of future income. Indeed, the whole concept of property rights and the present value of an expected income stream is changing. For reasons such as these, I think that the cost of capital is rising significantly.

William Brainard: Nordhaus has provided us with an extremely interesting and provocative paper. While verifying that there has indeed been a significant decline in the share of profits in the postwar period, he suggests that the current share is consistent with long-run equilibrium. Consequently, the decline has less serious implications for future prices and investment than might have been thought.

In the first portion of the paper Nordhaus discusses the conceptual issues involved in estimating profits, and attempts to correct for changes in the tax law, in financial structure, and in the price level, and for the difference between economic and tax-deductible depreciation. Nordhaus' calculations dramatize the fact that these changes in accounting can make an enormous difference in comparisons over time. For example, the adjustment of depreciation for changes in the price level increases by $7 billion between 1968 and 1973.

The three remaining portions of the paper constitute an imaginative and ambitious attempt to explain the short-run movement of profits by markup price behavior, and the long-run movements by investment and changes in the cost of capital. Nordhaus limits himself to a series of simple (although in some cases sophisticated) models for this purpose. The advantage of simple models is that they enable Nordhaus to make a complete but compre-

hensible picture out of the various pieces of a rather complicated puzzle; and in fact the models he specifies do a reasonably good job of explaining the data. Although Nordhaus' standard errors may look relatively large, they probably give a more accurate indication of the magnitude of forecast error than those studies that engage in more extensive data mining. The disadvantage of relying on a single model for each part of the puzzle is that this strategy does not reveal the extent to which alternative models and hypotheses, with perhaps quite different implications for the future, are also consistent with the historical record.

In the second portion of the paper, Nordhaus attempts to explain profits as the residual implied by a "normal price" equation, relating prices to factor costs at "normal" levels of output and productivity. Nordhaus estimates six versions of this equation, varying the cost base that is marked up. He finds that the equation that marks up only unit labor cost performs best in predicting both prices and profits. This equation explains most of the cyclical fluctuations in profits and a substantial portion, but not all, of the "profits sag" since the mid-sixties. As Nordhaus emphasizes, his exclusion of IVA in calculating profits, value added, and prices does much of the work in explaining the "sag"; in 1973 it reduced the residual by approximately $10 billion. It is quite possible, as Nordhaus argues, that at the present time most businessmen calculate profits and prices on a historical-cost, rather than a replacement-cost, basis and do not perceive profits to be as low as those implied by the Commerce Department's estimates. Consequently, the pressure to increase prices may be less than one would think from looking at the Commerce figures. If rapid inflation continues, however, the possibility that more and more firms will convert to replacement-cost calculation should temper the optimism that Nordhaus' results suggest.

All specifications of the Nordhaus price equation rest on a common set of assumptions. Noteworthy among them are the following: that demand does not influence prices; that the actual courses of output and productivity influence prices only as they affect estimates of their trends; that, in contrast, only current factor costs are used in price calculations; and finally that the postwar average rate of unemployment is the "normal" unemployment rate throughout the period. Although these assumptions will not be agreeable to everyone, modifying them is unlikely to alter the results significantly.

In the third portion of the paper, Nordhaus attempts to link profitability to the firm's long-run choice of capital-labor ratio. The cost-mini-

mizing normal capital-labor ratio is derived from a CES production function and converted into an observed capital-labor ratio by a cyclical correction. The estimated equation exhibits a strikingly low elasticity of substitution (0.02) with the implication that the gross share of capital is proportional to the rental-wage ratio. Perhaps more surprising than the low elasticity is its relatively small standard error, which puts an elasticity of 1 approximately 20 standard deviations away! These results may simply be the reflection of the fact that, correcting for cycle and trend, the capital-labor ratio is a very smooth series, making it impossible, with Nordhaus' specification, for the relatively volatile wage-rental ratio to have a large coefficient. If this explanation is correct, one would expect the use of a "normal" wage-rental ratio, or a partial adjustment form of the equation, to increase the standard error, if not the magnitude, of the elasticity estimate.

If the "sag" in profits is a result of a decline in the required rate of return to capital, these equations together with the markup equation suggest that there is no need to worry either about price increases to enable firms to "catch up" or about an investment bust. In the last section of his paper, Nordhaus turns to the questions of why the required rate of return on capital has fallen, and whether it can be expected to remain low. Measurement of the required rate of return on capital is a difficult conceptual and empirical task. I have some minor complaints about the particular assumptions Nordhaus makes. I think the statutory, rather than the effective, tax rate should be used when attempting to make comparable the cost of bonds and equity finance. Nordhaus argues that the relevant return is after tax and makes an effort to adjust for both the level and changes in the corporate tax law. In the same spirit, it would seem desirable to take into account the features of and changes in the personal income tax law, especially the differential treatment of capital gains and ordinary income which affects the desirability of bond as compared with equity finance. Ideally, as Nordhaus notes, the concept should be marginal. In addition, the cost of debt finance should include some imputed cost for the effect that increasing the debt-equity ratio has on the probability of bankruptcy.

The cost of capital that Nordhaus calculates shows the same qualitative behavior as the earnings-price ratio, with a substantial decline during the postwar period, concentrated primarily in the fifties. The cost of capital shows less decline, starting the period about 2 percent below the corrected earnings-price ratio and ending about 13 percent above. Nordhaus explains the decline as a result of a falling risk premium on equities, which he esti-

mates by relating the difference between the yield on equities and bonds to a (moving) twenty-year variance. Actually, then, he is estimating the difference between the risk premiums on equities and bonds. It is not obvious that the perceived risk on bonds is either zero or constant during the postwar period. Although most observers would agree with the presumption of a decline in the risk premium as the Great Crash has faded from memory, its exact timing and magnitude are obvious matters for speculation. In Nordhaus' regression, shortening the period over which the variance is computed would result in a faster decline early in the period, while lengthening the period would stretch the decline out.

Nordhaus believes that the risk premium is likely to stay at its relatively low current level, because the improvements in macroeconomic management and performance have been fully recognized by the market and are not likely to be reversed. I am not as confident. It is at least as plausible that the market overshot in the sixties and that investors had an overly optimistic view of the extent to which economic fluctuations were a thing of the past. Indeed, they may even have started to count on the capital gains that were themselves merely a consequence of a reduction in the "required rate."

William Nordhaus: I want to thank Professor Kaldor for his wide-ranging comments. He and I have quite similar views on the short-run determination of prices and profits for industrial firms, but our views on the long-run determinants of the rate of profits are divergent. First, on the question of the role of external financing in determining the cost of capital, Kaldor argues that since external and internal finance are complementary, external costs can be ignored. This is like saying that we can ignore the cost of left shoes in considering whether to buy a pair of shoes. Nor is it true that equity capital finances an insignificant fraction of investment; until recently, internal equity financed the lion's share of new investment.

On the determinants of the rate of return, Kaldor argues that—as long as the capital-output ratio is relatively stable—the rate of growth will determine the rate of profit. This proposition rests on the behavioral assumption that the share of internal financing in total investment is constant. Yet there is no good theoretical reason for it to be constant. In addition, when Kaldor's theory is checked out as an empirical proposition, it does rather poorly. There has been a secular decline of the share of internal finance over the postwar period. I believe that the declining share was probably a *result* of the declining rate of profit rather than its *cause*.

A more direct test of Kaldor's theory of the profit rate can be made by exploring the slight acceleration in the growth of normal output (see equation 5). Given this acceleration, Kaldor's theory would predict that the rate of profit would rise by about 10 percent. Instead, it fell by about 30 percent. In summary, I think it would be a mistake to base a theory of the rate of profit on a behavioral proposition that was grounded neither in theory nor in observation.

In response to the arguments by Brainard, Greenspan, and others, concerning the future path of the risk premium, my own view of the decline emphasizes the role of the Keynesian revolution on the cyclical stability of profits. Clearly there is some residual risk in uncertainty about such things as tax rates, inflation, environmental policy, and the rebirth of mercantilism; perhaps the sixties were a period of tranquility that could never be recovered. But I wonder whether objectively these uncertainties are quantitatively important, and I would guess that similar uncertainties have always been present.

General Discussion

Several participants questioned the low elasticity of substitution between capital and labor that Nordhaus estimates. Robert J. Gordon argued that a long-run average of the ratio of capital to labor costs should have been used in determining this elasticity, since capital has a long life and cannot be altered abruptly in response to variations in the costs of capital and labor. He felt that in Nordhaus' formulation, the true responsiveness of the capital-labor ratio was getting absorbed into the time trend of the equation. Robert Hall added that the influence of changes in factor prices on the capital-labor ratio was difficult to distinguish from the bias of technical change. In response to these comments, as well as to Brainard's, Nordhaus reported that he had done some sensitivity analysis on the elasticity of substitution between capital and labor. For example, he tested whether longer lags would affect the results. For most alternatives, there was little change in the estimated coefficients, although the standard errors were sometimes somewhat larger.

The Nordhaus finding of a profit plunge elicited a lively discussion. Gordon believed it important to extend Nordhaus' analysis to the prewar period. The real puzzle was why profits had been so high in 1948 relative to the 1920s, 1950s, and 1960s. Nordhaus noted that the rate of return

in 1948 was usually attributed to scarce capacity. However, the ratio between the rate of return and the cost of capital was about the same in 1948 as in 1974, so this simple explanation did not seem adequate.

Gordon doubted that the risk-premium thesis would explain the behavior of profits in the 1920s, when the perceived risks were great but profit margins were quite low. William Poole suggested that one measure of the risk premium for a given period would be the ratio between the yields on low- and on high-grade bonds, with their different risks of default. The differential varied over the business cycle in response to investors' fears about defaults. Nordhaus agreed that Poole's suggestion was a good one.

Michael Lovell felt it was important to test the sensitivity of Nordhaus' results to alternative structural specifications. For example, Nordhaus' equation for normal output follows from Muth's concept of adaptive expectations, and Lovell suggested trying Nerlove's concept of rational expectations to see if the results hold up. Nordhaus replied that he thought the possibilities were more or less covered by his taking Greenspan's suggestion to substitute utilization rates for a projection of normal output. Lovell also wondered whether Nordhaus' "businessman's convention" with regard to inventory accounting could properly govern business decisions. If firms interpret capital gains on inventories as profits, they may find over a period of time that the business cannot replenish itself.

Several panel members queried the lack of a role for price controls in the Nordhaus profits story. Price equations estimated by others found substantial residuals starting in the fourth quarter of 1971, suggesting a squeeze of prices relative to costs beginning at that time. Gordon attributed the discrepancy to Nordhaus' practice of constraining the elasticity of price to standard labor cost to unity. Nordhaus' equation also ignored the effect of actual productivity and labor costs on prices, which in Gordon's past work accounted for about 20 percent of price increases. Nordhaus noted that his IVA illusion showed up about the same time as price controls, so that it was difficult to determine which of the two was really the villain.

Hall pointed out that with Nordhaus' finding of a gap of only about 5 percent between prices and total costs, price controls would run a considerable risk of causing shortages. Nordhaus remarked that the 5 percent gap applied to long-run costs. Short-run marginal costs would be much lower, so that it would take some time for a price squeeze to cause shortages.