TRENDS IN CORPORATE PROFITABILITY
AND CAPITAL COSTS

Daniel M. Holland and Stewart C. Myers

WP 937-77   May 1977

TRENDS IN CORPORATE PROFITABILITY
AND CAPITAL COSTS

Daniel M. Holland and Stewart C. Myers

WP 937-77   May 1977

TRENDS IN CORPORATE PROFITABILITY AND CAPITAL COSTS[1]

Daniel M. Holland and Stewart C. Myers
Sloan School of Management, M.I.T.

I.   OBJECTIVES AND MAJOR CONCLUSIONS

One striking aspect of the U.S. economy's performance during the last decade is the decline in the rate of return on corporate capital. The potential significance of this "fact" is clear but its actual significance is not. The decline may or may not indicate a basic structural shift in the U.S. economy. It may reflect a serious weakness, a natural and benign result of market forces, or something in between. Which interpretation is correct depends on several considerations, in particular the following.

1. The steepness of the downward movement depends on how rate of return is defined and which data are used to measure it.

2. Whether the decline is serious depends on the level from which it starts. If the mid-1960's was a period of unusually high profitability, then the subsequent decline may merely be a return to normal levels.

3. The trend's importance depends on whether the cost of capital has declined proportionally. If it has, then the falling rate of return need not, in itself, be cause for concern.

We have attempted to clarify the issues posed by declining corporate profitability over the last decade, to evaluate the evidence for longer-term trends in profitability, and provide additional evidence about causes and consequences. Our report is organized around two simple questions.

1. How have U.S. non-financial corporations (NFC's) fared?

2. How have rates of return on real capital held by NFC's behaved
   relative to capital costs?

We answer the first question by determining how well investors in non-finan-
cial corporations have done. That is, we argue that the best single measure
of the performance of the NFC sector is changes in the capital market's
aggregate valuation of the securities issued by the firms in this sector.
We answer the second question by estimating rates of return on the capital
stock of NFC's. In most cases we have looked as far back in time as the
available data permit -- usually to 1929 -- but most of our analysis is
directed towards the postwar period from 1946-1975.

     At the risk of oversimplification, our main conclusions can be
stated as follows.

1. Non-financial corporations have fared poorly since the mid-1960's.
   This fact is evident from the most casual examination of stock market
   data, and it stands up to careful examination. On the other hand, NFC
   performance in the postwar period ending in 1965 was excellent.

2. When the market value of the securities of NFC's
   is measured relative to the net reproduction cost of real capital held
   by the NFC sector, the mid-1960's is revealed as an unusually favorable
   period. However, today's market values are not unusually low compared
   to values prevailing in, say, the 1950's. Instead of asking why
   today's performance is poor, we might as well ask why performance
   in the early and mid-1960's was so good.

3. Rates of return on real capital show the same pattern as market values:
   exceptional performance in the mid-1960's followed by a decline to levels
   more typical of the early postwar period.

4. <u>Real</u> costs of capital seem to have been stable since about 1955.

    Since then, fluctuations in the market value of non-financial corpora-

    tions have been much more closely related to changes in operating

    profitability than to changes in capitalization rates.

The implications of our findings are discussed in the concluding section
of this report. We also note there several areas in which further research
would be helpful.

II. THE PERFORMANCE OF NON-FINANCIAL CORPORATIONS

Introduction

We are concerned with the profitability of non-financial cor-
porations in the aggregate. Although NFC's by no means account for all
of the private sector, they are the major part of it. More than half
of Gross Domestic Product (GDP) originates in the NFC sector. NFC's account
for more than 90 percent of corporate GDP, and more than 60 percent of
total business GDP. The net replacement cost of assets held by NFC's now
exceeds $1.2 trillion. Thus the past performance and current health of
this sector is a matter of interest and concern.

It is a widely accepted fact -- a fact which we reconfirm below --
that NFC profitability has fallen significantly since 1965. Is this evi-
dence of relatively poor performance conclusive and unambiguous? Not en-
tirely so: there are a number of difficulties.

1. The rate of return on captial can be computed in countless ways.
    Some indicate a more serious decline than others. The National Income
    Accounts provide   several different estimates of depreciation,
    for example. Each implies a different measure of income, a different
    value for net capital stock, and a different rate of return.

2. What is to be included in capital stock? Most estimates for NFC's
    in aggregate include only the net replacement cost of inventory and
    physical capital -- buildings, machinery and equipment. Land is
    usually excluded -- its true value is extremely difficult to measure
    in any case. So is net working capital, aside from inventory.

3. What about intangible assets? These include, for example, the
    extra value of a going concern over a random collection of physical
    assets, as well as the value of cumulative expenditures on research,
    marketing, and employee training. The extra costs incurred in a
    period of learning-by-doing are a relevant asset which is almost
    never shown on corporate balance sheets. Firms acquire valuable
    investment opportunities by virtue of past activities.[2/] Even
    monopoly power is an asset from the investor's viewpoint.

    The problems implicit in these questions have absorbed many
man-years of study. Despite this work, rates of return calculated from
accounting data are never entirely free of errors of definition and meas-
urement. Of course these statistics are indispensable for many purposes.
But they are not ideally suited for determining how business firms have
fared over the last decade or some longer period.

    There is a simple alternative. The value of the firm is not
determined by the cumulative funds invested in it, or by the net replace-
ment cost of its stock of real capital, but by the stream of earnings it
generates for investors. The value of this stream at any time can be ob-
served directly by summing the market value of all of the firm's outstand-
ing securities. This is the true value of all of that firm's assets.
The income realized in any particular period can be found by adding the
cash payments received by investors to the change in the market value of
the firm's securities over the period, computed net of any new issues
of securities. The rate of return earned by that firm is found by divid-
ing income by start-of-period market value.

In short, we propose to answer the question, "How well have non-financial corporations performed?" by using capital market data.

There may be some popular resistance to the idea of using stock and bond values to answer so fundamental a question. Many regard the stock market as irrational, and therefore an untrustworthy source for information about real phenomena. We believe such suspicions are unfounded.

Some make the elementary logical error of confusing volatility with irrationality. There is no necessary connection. The stock market is a major locus for risk-bearing. In our view the stock market's volatility accurately reflects the high degree of uncertainty actually existing in the economy. In fact, we suspect accounting estimates of firm values precisely because they are so stable.

Some doubts may stem from conceit, in the form of an individual's belief that he or she has a more accurate assessment of firm values than the capital markets can provide. Often this belief is based on hindsight. The belief is suspect anyway, since so few professional investors -- who are presumably the most knowledgeable -- have been able to outperform the market consistently.[3/]

Some doubts may reflect the inability to explain the day-to-day or week-to-week movements of the stock market. Yet it is intellectual arrogance to assume that something which cannot be explained is irrational or meaningless. In any case, we are not concerned with short-term market fluctuations, but with market behavior over a period of many years.

There is strong positive evidence that capital markets are efficient, in the sense of responding promptly and accurately to new information.[4/] This is the main reason why we use capital market data with confidence.

Rates of Return to Investors in Non-Financial Corporations

Table 1 shows nominal and real rates of return earned by in-
vestors in NFC's for various one- and five-year intervals between 1929
and 1975. The time pattern of rates of return is obvious -- but, before
concluding anything from the pattern, it is important to understand how
these figures were computed.

The rate of return R_t is defined as follows:

$$R_t = R_t(D) \left(\frac{MV_t(D)}{MV_t} \right) + R_t(E) \left(\frac{MV_t(E)}{MV_t} \right) , \qquad (1)$$

where $R_t(E)$ = the rate of return earned in year t on a portfolio of all
the equity shares of all NFC's. $R_t(E)$ includes both divi-
dends and capital gains.

$MV_t(E)$ = the market value of that equity portfolio at the start of
year t.

$R_t(D)$ = the rate of return earned in year t on a portfolio of all
the net outstanding debt of NFC's. $R_t(D)$ includes interest
receipts and capital gains or losses.

$MV_t(D)$ = the market value of that debt portfolio at the start of
year t.

MV_t = the total market value of all NFC securities
($MV_t(D) + MV_t(E)$) at the start of year t.

Thus R_t is the rate of return earned on a portfolio of all securities
issued by NFC's. It is the return to all bond- and stockholders considered
as a group.

Table 1

AVERAGE RATES OF RETURN EARNED BY INVESTORS
IN NON-FINANCIAL CORPORATIONS, 1929-75

A. Annual Returns (Percent)

Year	Nominal Return	Real Return	Year	Return	Real Return
1929	-6.6	-6.8	1953	-.1	-0.7
1930	-18.8	-12.8	1954	42.5	43.0
1931	-32.2	-22.7	1955	24.7	24.3
1932	-4.4	5.9	1956	4.5	1.6
1933	35.4	34.9	1957	-7.8	-10.8
1934	4.0	2.0	1958	35.4	33.6
1935	32.7	29.7	1959	9.8	8.3
1936	25.1	23.9	1960	1.8	0.3
1937	-23.5	-26.6	1961	22.9	22.2
1938	21.8	24.6	1962	-6.0	-7.2
1939	1.1	1.6	1963	18.5	16.8
1940	-5.4	-6.4	1964	14.4	13.2
1941	-6.4	-16.1	1965	10.2	8.3
1942	13.4	4.1	1966	-8.2	-11.6
1943	18.4	15.2	1967	17.8	14.8
1944	15.5	13.4	1968	9.5	4.8
1945	27.4	25.2	1969	-8.4	-14.5
1946	-6.5	-24.7	1970	7.1	1.6
1947	4.5	-4.5	1971	13.4	10.0
1948	5.3	2.6	1972	15.9	12.5
1949	16.3	18.1	1973	-10.9	-19.7
1950	25.0	19.2	1974	-19.3	-30.8
1951	19.1	13.2	1975	28.6	21.6
1952	15.5	14.6			

B. Five-Year Average Returns (Percent)

Period	Return	Real Return
1929-35	1.4	4.3
1936-40	3.8	3.4
1941-45	13.7	8.4
1946-50	8.9	2.1
1951-55	20.3	18.9
1956-60	8.7	6.6
1961-65	12.0	10.7
1966-70	3.7	-1.0
1971-75	5.5	-1.3

Table 1 (continued)

Sources

1. Annual returns are weighted averages of rates of return on debt and
   equity held from the beginning to the end of the year.

   The equity rate of return is the annual rate of return, including
   both dividends and capital gains, on the Standard and Poor's Composite
   Index, as reported in R. Ibbotsen and R. Sinquefield, "Stocks, Bonds,
   Bills and Inflation: Year-by-Year Historical Returns (1926-74).
   Journal of Business 49 (January 1976), Table 1, pp. 20-22. Figures
   for 1975 were generously supplied by Ibbotsen and Sinquefield.

   The debt return is the rate of return on a portfolio of long-term
   corporate bonds constructed by Ibbotsen and Sinquefield. The returns
   are reported by Ibbotsen and Sinquefield in their Table 3, pp. 26-28.

   The portfolio weights are the proportional contributions of debt and
   equity to the total estimated market value of all nonfinancial cor-
   porations. See Appendix Table A1.

2. Real returns are found by subtracting percentage changes in the con-
   sumer price index, as reported by Ibbotsen and Sinquefield, Table 5,
   pp. 32-34.

3. The returns in Panel B are simple averages of the returns in Panel A.
   Note that the period 1929-35 actually contains seven years.

We examine R_t rather than $R_t(E)$ because we are concerned with the performance of the entire NFC sector, not with the return received by holders of a claim on part of that sector's earnings. Stockholders may have gained at the expense of bondholders, or vice versa, but that is not relevant here.[5] It is also important that our profitability measure be unaffected by shifts in capital structure over time.[6]

Of course, not all NFC securities are publicly traded. Even for securities that are publicly traded, price data are not always conveniently available. Therefore it was necessary to work out a procedure for estimating the variables in Eq. (1).[7] $MV_t(D)$ was found by capitalizing net interest paid by NFC's by the Moody's Baa interest rate.[8] Similarly, $MV_t(E)$ was found by capitalizing net NFC dividends by the dividend yield on the Standard and Poor's Composite Stock Index. $R_t(D)$ is the rate of return on a portfolio of long-term corporate bonds. $R_t(E)$ is the rate of return on the Standard and Poor's Composite Stock Index. The details of the calculations are described in notes to the table and in the Appendix.

Since the MV's are estimates, we cannot be sure that the values shown are absolutely accurate at any point in time. But we are confident that any careful estimate of market values will show the same pattern across time.

The rates of return R_t are extremely volatile when measured on an annual basis. That is evident from Panel A of Table 1. However, hindsight reveals a pattern.[9] Investors in NFC securities fared very well indeed after World War II and up to about 1965, but poorly after that. The contrast between the first and second half of the 1960's is dramatic, particularly when real rates of return are examined. (See the five-year

average returns shown in Panel B.) The poor performance of the late

1960's continues in the first half of the 1970's. The evidence in Table

1 indicates that non-financial corporations have earned, on average, a

negative real rate of return over the last decade.

Figure 1 displays the returns in a different way. Suppose that

at the start of 1947 you had invested $1.00 in the portfolio of all bonds

and stocks issued by NFC's. That is, you started by owning a very small

fraction of the portfolio of all NFC securities, which in aggregate was

worth MV_{1947}. You then followed a buy-and-hold strategy, reinvesting all

dividends and interest. The rate of growth in this investment's value

indicates how well or poorly NFC's have fared.

Of course Figure 1 tells the same story as Table 1, but it is told

in a way that may be easier to appreciate. Both nominal and real values

increased rapidly, with few interruptions, up to about 1965. After that

there was slower and more erratic growth in the portfolio's nominal value.

Its real value declined.

Aggregate Market Value of NFC Securities

There is still another way to look at capital market data. The

upper line in Figure 2 shows "q,"[10/] the ratio of NFC market value, MV_t,

to CS_t, the net replacement (not historical) cost of NFC capital stock and

inventory.[11/] q_t is plotted for the period 1946-75. Scaling market value

by CS_t adjusts for that part of the movement in MV_t that was due to infla-

tion and expansion of the scale of NFC operations. A value of q = 1.0

means that the market value of the earnings stream generated by NFC assets

is exactly equal to the net replacement cost of those assets. This is the

Figure 1: VALUE OF PORTFOLIO OF NFC SECURITIES -- BUY AND HOLD INVESTMENT STRATEGY
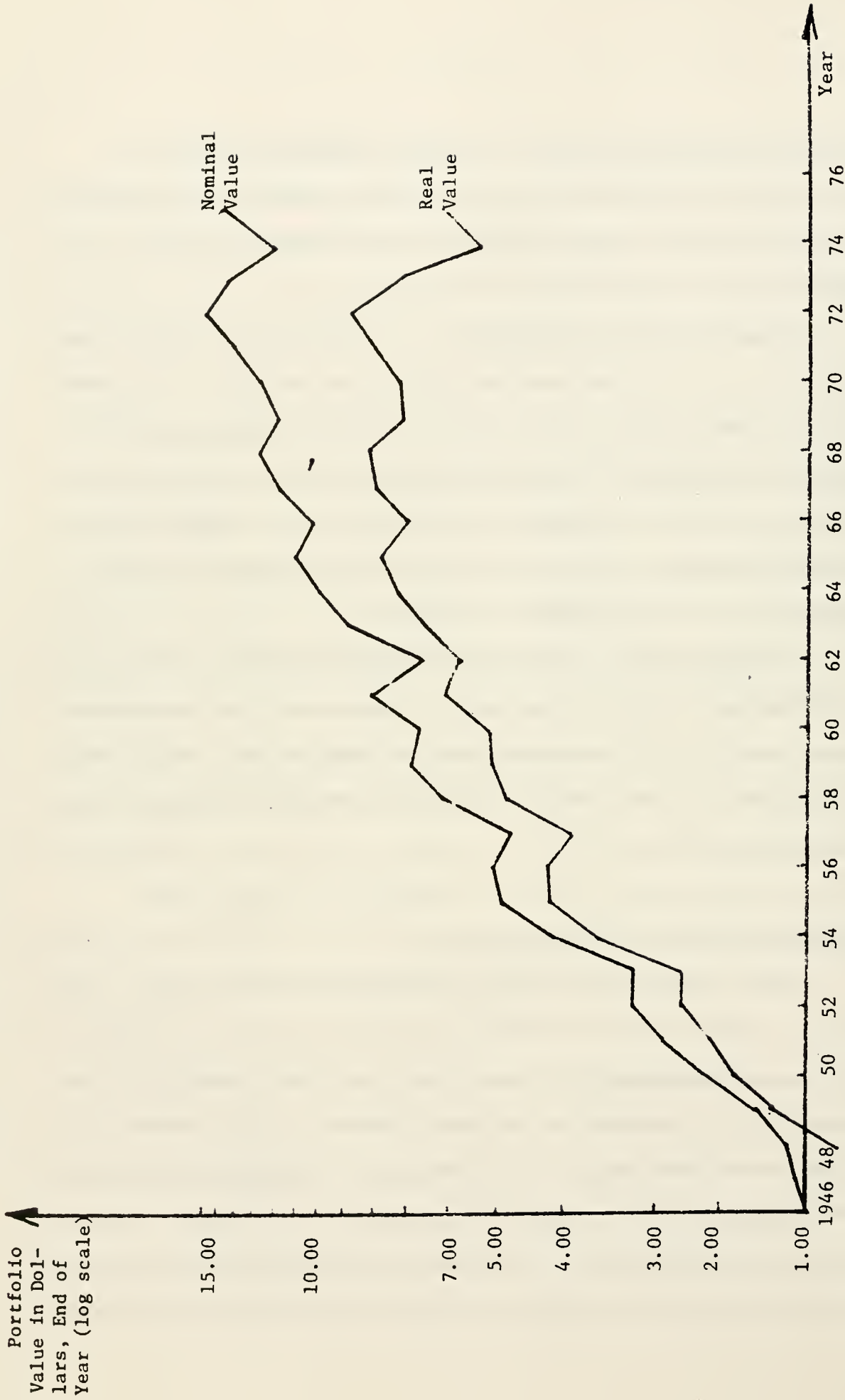
Source: Table 1
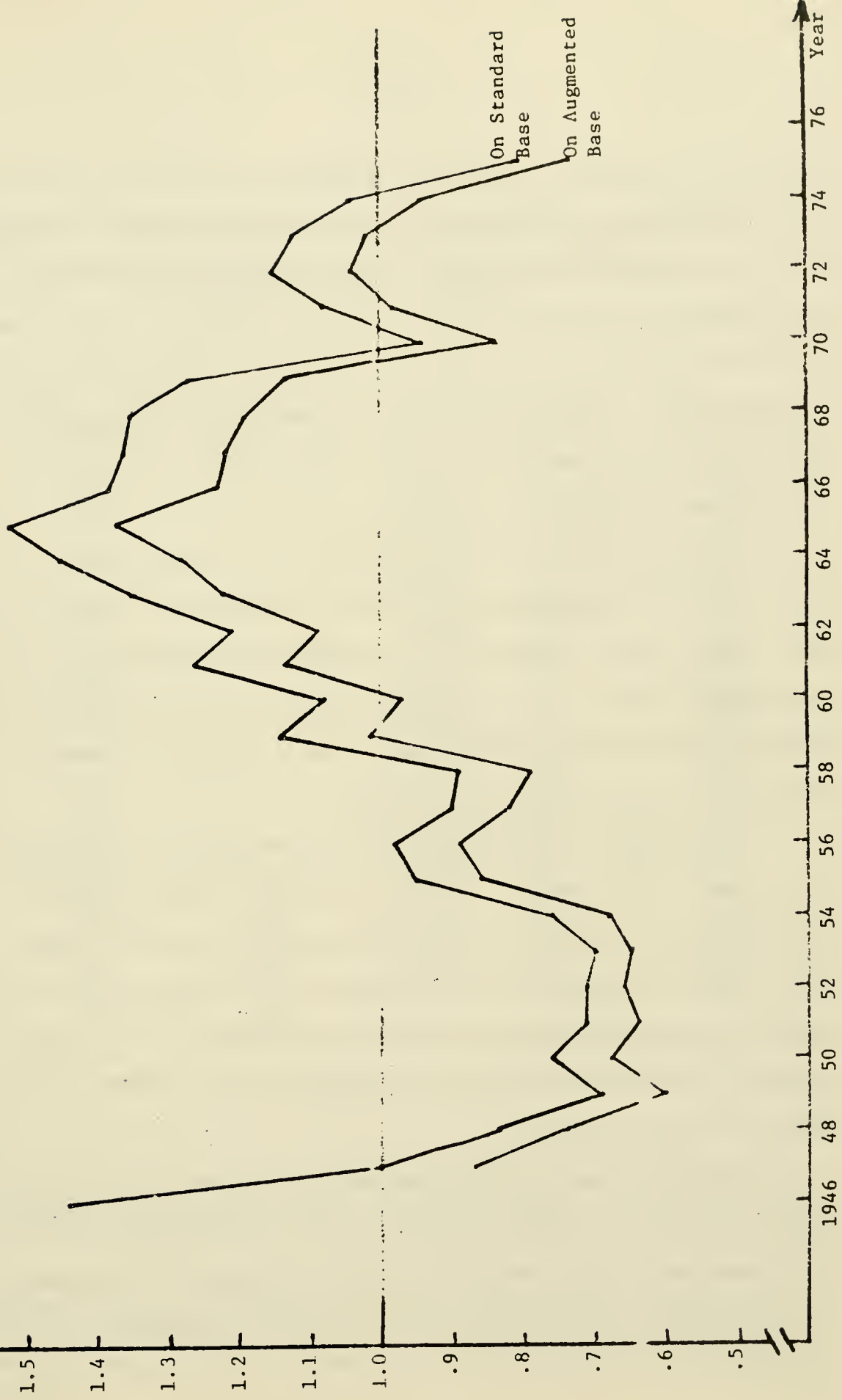
Source: Table 2

value for q we expect to observe <u>if</u> the economy is in long-run equilibrium,
<u>if</u> the definition of CS_t includes all income-producing assets, and <u>if</u> MV_t
and CS_t are measured without error. Recognizing these "ifs," we should
not read too much significance into the absolute value of q. It is never-
theless odd to find q so far below 1.0 in the early postwar period. If
the estimates are anywhere near correct, it was far cheaper for firms to
add capacity by purchasing other firms, than by buying fresh plant,
equipment and inventory.

The year 1965 is the turning point for q. From there it has
followed an erratic downward course to its current value of about 1.0.
Note, however, that q remains well above the levels characteristic of the
early postwar period. In fact, the high rates of return earned by investors
in NFC securities over the 1946-55 period can be largely attributed to the
recovery of q to more "reasonable" levels.

The bottom line in Figure 2 shows q computed on an "augmented"
capital base. The augmented base includes not only inventory and real
capital but also estimates of the other assets held by NFC's -- land,
cash, accounts receivable, etc. The estimation and significance of the
augmented base are discussed below and in the Appendix. For the moment
we merely note that the choice of the base used in calculating q does not
affect its pattern over time.

Numerical values for the standard and augmented q are given in
Table 2 for 1929-75. There is one major surprise in the prewar data.
q was higher in 1936 than it has been at any time since! Its average level
from 1934-39 compares favorably with the best years of the 1960's. The

Table 2

RATIO OF AGGREGATE MARKET VALUE OF NON-FINANCIAL CORPORATIONS

TO NET REPLACEMENT COST OF CAPITAL STOCK, INVENTORY

AND OTHER ASSETS, 1929-75

Year	q (Standard)	q (Augmented)	Year	q (Standard)	q (Augmented)
1929	1.93		1953	.70	.65
1930	1.69		1954	.76	.68
1931	1.09		1955	.95	.86
1932	.57		1956	.98	.89
1933	1.14		1957	.90	.82
1934	1.46		1958	.89	.79
1935	1.44		1959	1.12	1.01
1936	2.34		1960	1.08	.97
1937	1.95		1961	1.26	1.13
1938	1.06		1962	1.21	1.09
1939	1.53		1963	1.35	1.22
1940	1.27		1964	1.45	1.28
1941	1.10		1965	1.52	1.37
1942	.89		1966	1.38	1.23
1943	1.19		1967	1.36	1.22
1944	1.19		1968	1.35	1.19
1945	1.31		1969	1.27	1.13
1946	1.44		1970	.94	.84
1947	1.00	.87	1971	1.08	.98
1948	.84	.74	1972	1.15	1.04
1949	.69	.60	1973	1.12	1.02
1950	.76	.68	1974	1.04	.94
1951	.71	.64	1975	.80	.73
1952	.71	.66			

Source:

1. The standard q is the ratio of the total market value of non-financial
    corporations (from Table A1) to their net capital stock and inventories
    (Table A2a, Column 5).

2. The augmented q differs only in its denominator. Market value is
    divided by total non-financial assets of non-financial corporations
    (Table A3, column 7).

    Data were insufficient to calculate the augmented base for years prior
    to 1947.

immediate reason is the actual shrinkage of the net replacement cost of capital stock in the 1930's, (see Appendix Table A2a) combined with the recovery in market value beginning in 1934 (see Table A1). We have not identified a deeper reason. But at least the magnitude of q warns against the characterization of all of the 1930's as a bleak time for U.S. corporations.

Interpreting q

Despite its interest and usefulness, q is easy to misinterpret. Of course, there are problems of aggregation: the q for all NFC's hides substantial interindustry and interfirm variation. There are also difficult problems of measurement and definition.

Consider, for example, the following statement from the 1977 Economic Report of the President:[12]

> If . . . assets are valued in the market significantly above their replacement cost, corporations will be encouraged to invest in new equipment and thereby create capital gains for the owners of their securities.

Properly interpreted this statement is correct, but it is nevertheless ambiguous if taken literally.

Consider how the level of an individual firm's q affects the firm's rate of investment. Figure 3 portrays the investment decision: the firm invests to increase capacity until V, the present value of forecasted net cash flows generated by an additional machine, declines to C, the cost per machine. Since all but the last machine have positive net present values, $(V - C > 0)$, the firm's q exceeds one. But the net present value of the marginal machine is zero. That is, the marginal q equals exactly 1.0.

The quotation cited could be misinterpreted as a prediction that firms will continue investing so long as the average q -- which is what we observe -- is greater than one.

It is true that both average and marginal q's equal one in a long-run equilibrium. If all industries are competitive, and if the denominator of q correctly measures the value of all assets, including intangible ones, then any opportunities to make investments having positive net present values must last only for the short-run. In this sense it is true to say that q > 1 for some firms implies profitable investment opportunities for others.

On the other hand, positive q's which reflect stable market power would be self-sustaining. So would the q's of firms holding significant intangible assets.

The quotation above would be unambiguously correct if it referred to an increase in q. That is, an increase in q should predict an increase in the rate of investment. Consider a firm starting at the optimal capacity level a determined by V = C. In Figure 3a, the investment opportunity schedule shifts up to V', thus increasing q. Investment increases in response, lifting capacity to a new equilibrium above the initial level (1).

The actual adjustment might occur in a number of ways. If C is constant the firm moves directly to (2), perhaps with a delay. It is perhaps more realistic to assume the firm faces an upward sloping cost curve C' in the short run, with the steepness of the curve depending on the speed of adjustment. Still another possibility is that producers of machines will, at least in the short run, capture some of the rents due to the upward shift in V. This gives a cost curve C" and the equilibrium position (4).

But we can say the following regardless of the adjustment mechanism: because q reflects the expected profitability of corporate investment relative
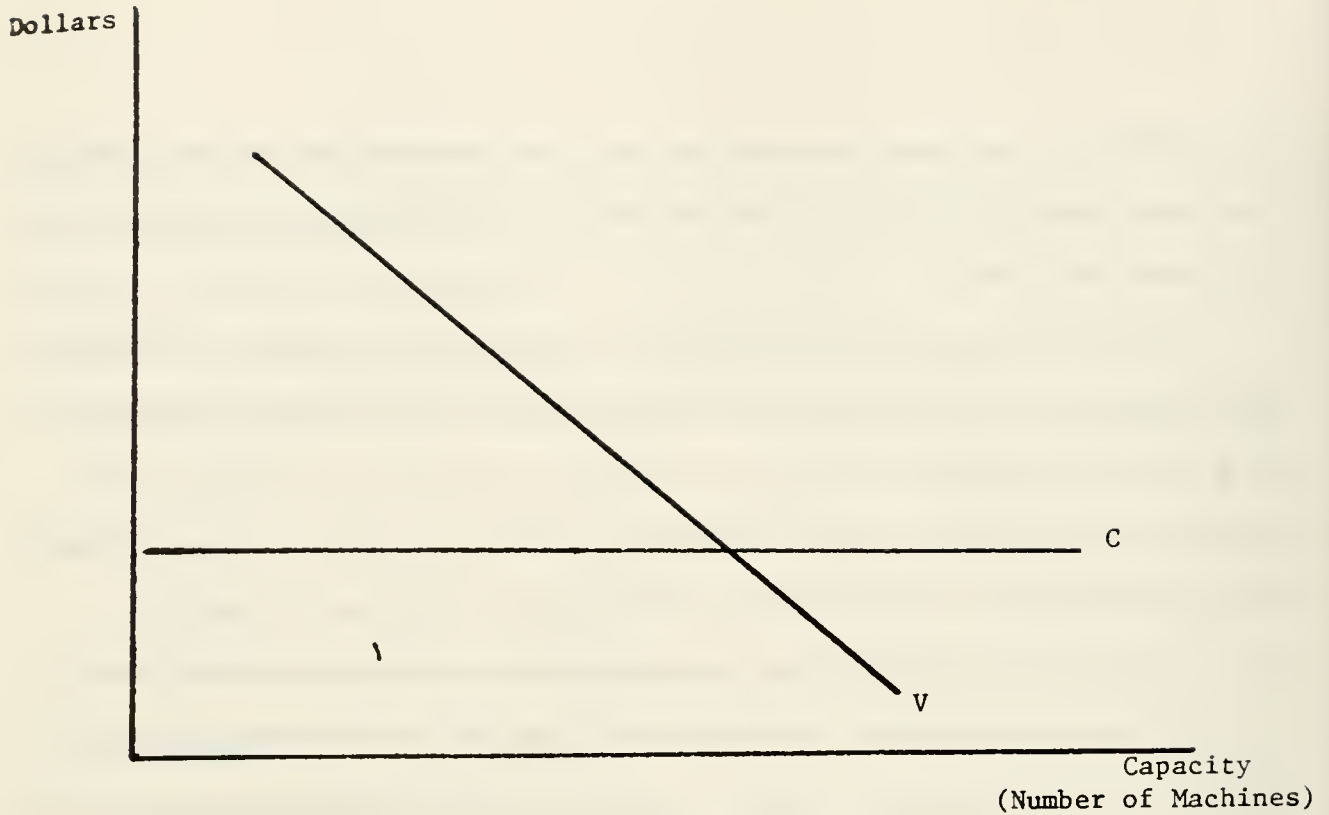
Dollars

C

V

Capacity
(Number of Machines)

Fig. 3.   The Firm's
Investment Decision

Dollars

C'

C"

V
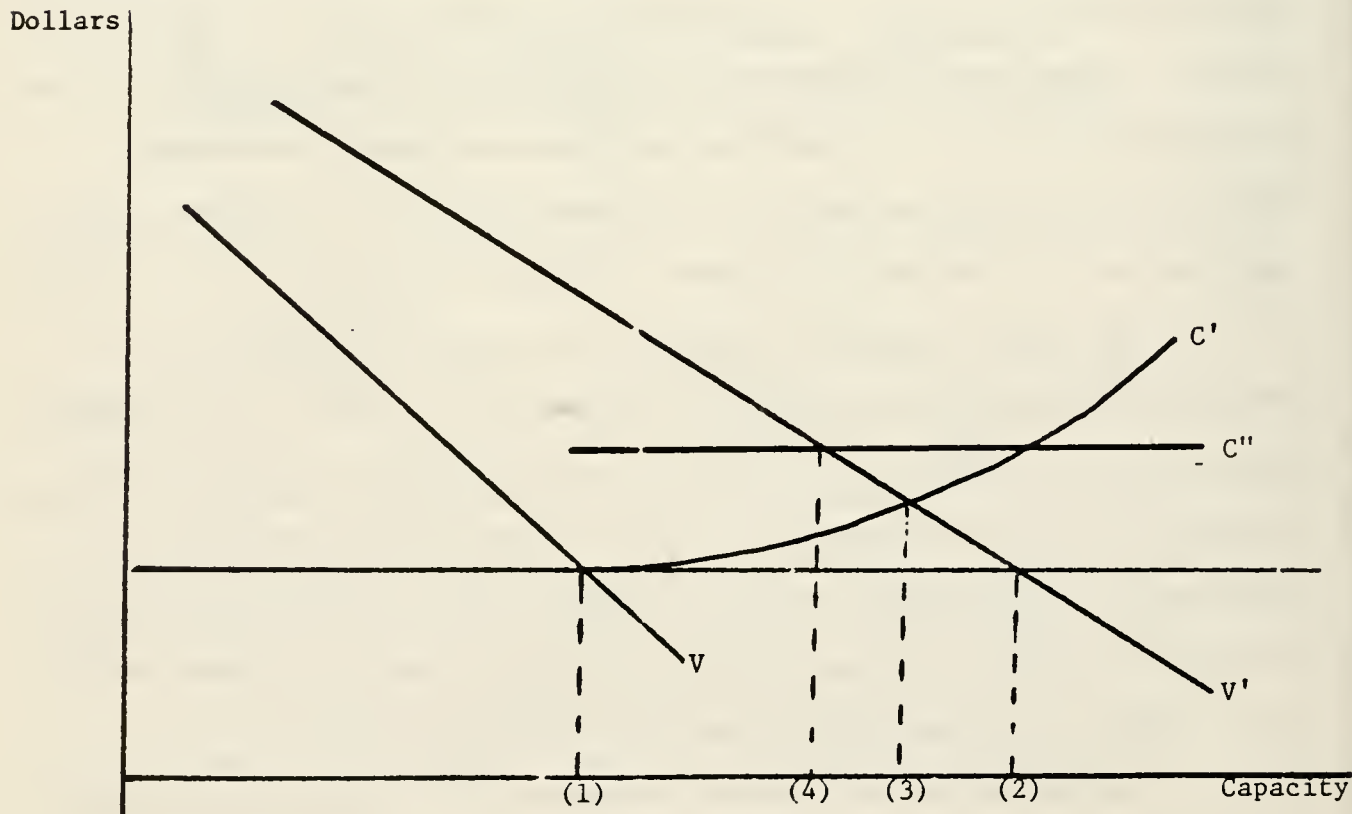
V'

(1)   (4) (3)   (2)   Capacity

Fig. 3a.   Effects of a Decrease
in q on Investment in Physical Capital

to the opportunity cost of capital, an increase in q should signal increased corporate investment.[13/]

We have assumed in all of this that the denominator would always be determined by the initial cost level C. The adjustment costs in C' would not be picked up in capital stock as measured in the National Income Accounts, although one could argue that they should be. For example, if firms face adjustment costs, then the true secondhand value of all machines at the time of Figure 3a is not C, but C' at capacity level 3. Nor would the National Income Accounts pick up a short run increase in costs to C''. The denominator as we measure it has to be thought of as a long run replacement cost, given current prices and technology. It probably does not adequately reflect year-to-year changes in the marginal cost of adding new capacity.

Conclusions

The first 20 postwar years were a generally favorable period for NFC's. Investors in NFC securities earned average rates of return on market value that seem, in hindsight, to be unusually generous. In 1946 the aggregate market value of NFC stocks and bonds was roughly one and one half (times) net replacement cost of NFC inventory and capital stock. But for the next 12 years the aggregate market value of NFC securities was below the net replacement cost of physical assets held by NFC's. A sharp relative rise in market value started in 1959. By 1965, aggregate market value was 50 percent larger than a greatly expanded base of inventory and real assets.

There was a dramatic reversal of fortune in the next decade. Real rates of return to investors were low and often negative. Aggregate

market value fell to roughly the same level as the inventory and real asset
base.

Of course we have no clue about <u>why</u> all this happened. Values
observed in capital markets show us only the end result of a complicated
process. Insights into earlier stages of the process must come from other
measures of profitability.

III. RATES OF RETURN ON CAPITAL STOCK

In this section we examine the profitability of the corporate non-financial sector from a different point of view. In section II we derived estimates of income and value from capital market data. The estimates in this section are based on annual measures of asset value and operating income developed by the Bureau of Economic Analysis of the Department of Commerce as part of the National Income and Product Accounts (NIPA). In effect we are moving from capital market measures of return to the "book" or "accounting" measures utilized by business firms.

The capital market measures are sufficient to tell us how well NFC's have fared, but they give no clue to the reasons for good or bad performance. For example, we have no way of inferring from market value data whether the period of unusually high market values in the mid-1960's was due to high operating profits, to low capitalization rates for NFC securities, or to a combination of both effects. The interpretation of capital market data requires information from other sources.

Many measures of rate of return can be derived from NIPA data. The one we emphasize most is the rate of return on capital stock (ROC), defined as the ratio of NFC operating income, <u>before interest</u>, to the net replacement cost of NFC depreciable capital stock and inventories. Our estimates are based on newly revised series prepared by the Bureau of Economic Analysis. Several important recent studies of the ROC have been based on national income accounts data[14] but our analysis incorporates the latest revisions.[15] As is explained below, these revisions could be substantial enough, in our opinion, to change one's interpretation of the "trend" in ROC.

Following other investigators, we interpret ROC as the real rate of return on NFC capital stock. Of course, such an interpretation rests on a number of assumptions, some of which are not strictly true. Firms must invest in other assets besides inventories and depreciable capital stocks, for example. (Towards the end of this section we examine ROC computed on an "augmented" investment base.) Also, operating income equals real income only if there are no real holding gains on capital stock and inventories -- i.e., only if the reproduction costs of capital stock and inventories rise at exactly the same rate as prices generally. (Again, later in this section, we adjust ROC for holding gains or losses.)

Nevertheless, operating income is an important indicator of corporate performance and a decent first approximization to real income. Moreover, the conclusions we reach below are insensitive to the exact definition of income or ROC.

Before-Tax Rates of Return

The first column of Table 3 presents before-tax ROC's for the NFC sector for the period 1929-75. These ROC's are plotted in Figure 3 for the postwar period.

We will concentrate mainly on the postwar period. Three distinct periods can be noted. From 1946 through 1960, the before-tax ROC tended to decline, but with sharp year-to-year fluctuations. The average ROC was 13.2 percent. The decade of the 1960's saw a sharp upward burst in the first half of the decade and a symmetrical decline in the second half. The average for the period 1961-70 was 13.3 percent, slightly higher than in the preceeding years. Finally for the short period 1971-75, the average was 10.2, noticeably lower than the other two periods.

Table 3

RATES OF RETURN ON THE NET REPLACEMENT COST OF CAPITAL STOCK
AND INVENTORIES OF NON-FINANCIAL CORPORATIONS, 1929-75

Year	Before-Tax Rate of Return[1]	After-Tax Rate of Return[2]
1929	10.7	9.5
1930	5.3	4.5
1931	1.6	1.0
1932	-1.1	-1.5
1933	3.4	2.7
1934	5.4	4.3
1935	6.8	5.6
1936	10.2	8.2
1937	10.1	8.1
1938	5.9	4.7
1939	10.3	8.4
1940	13.3	9.8
1941	20.7	12.0
1942	22.6	10.7
1943	25.0	11.0
1944	23.4	10.7
1945	18.5	8.4
1946	12.5	5.2
1947	14.1	6.8
1948	15.6	8.6
1949	13.3	8.1
1950	15.7	7.0
1951	15.8	6.1
1952	13.3	5.8
1953	12.4	5.1
1954	11.6	5.6
1955	14.4	7.1
1956	12.4	5.8
1957	11.3	5.5
1958	9.6	4.9
1959	12.1	6.3
1960	11.2	5.9
1961	11.1	5.8
1962	12.8	7.5
1963	13.6	8.0
1964	14.7	9.0
1965	16.0	9.9

Table 3 (continued)

1966	15.8	9.9
1967	13.9	8.8
1968	13.6	8.1
1969	12.0	7.0
1970	9.4	5.7
1971	9.7	5.9
1972	10.8	6.8
1973	10.4	6.3
1974	7.8	4.1
1975	8.1	5.0

[1] The before-tax rate of return is the ratio of (1) before tax operating income of non-financial corporations, to (2) the net replacement cost of non-financial corporations' inventory and capital equipment. Item (1) is calculated after straight-line depreciation on the net replacement cost of capital equipment, assuming asset life is 85 percent of lives published in the Department of Commerce's Bulletin F. Item (1) is before interest and does not include inventory profits. Item (2) is the average of inventory and capital equipment values observed at the start and end of the calendar year. See Tables A2a and A4a.

[2] The after-tax rate of return is calculated in exactly the same way as the before-tax figure, except that taxes paid are subtracted from operating income. It is defined after-taxes but before interest. See Table A4a.
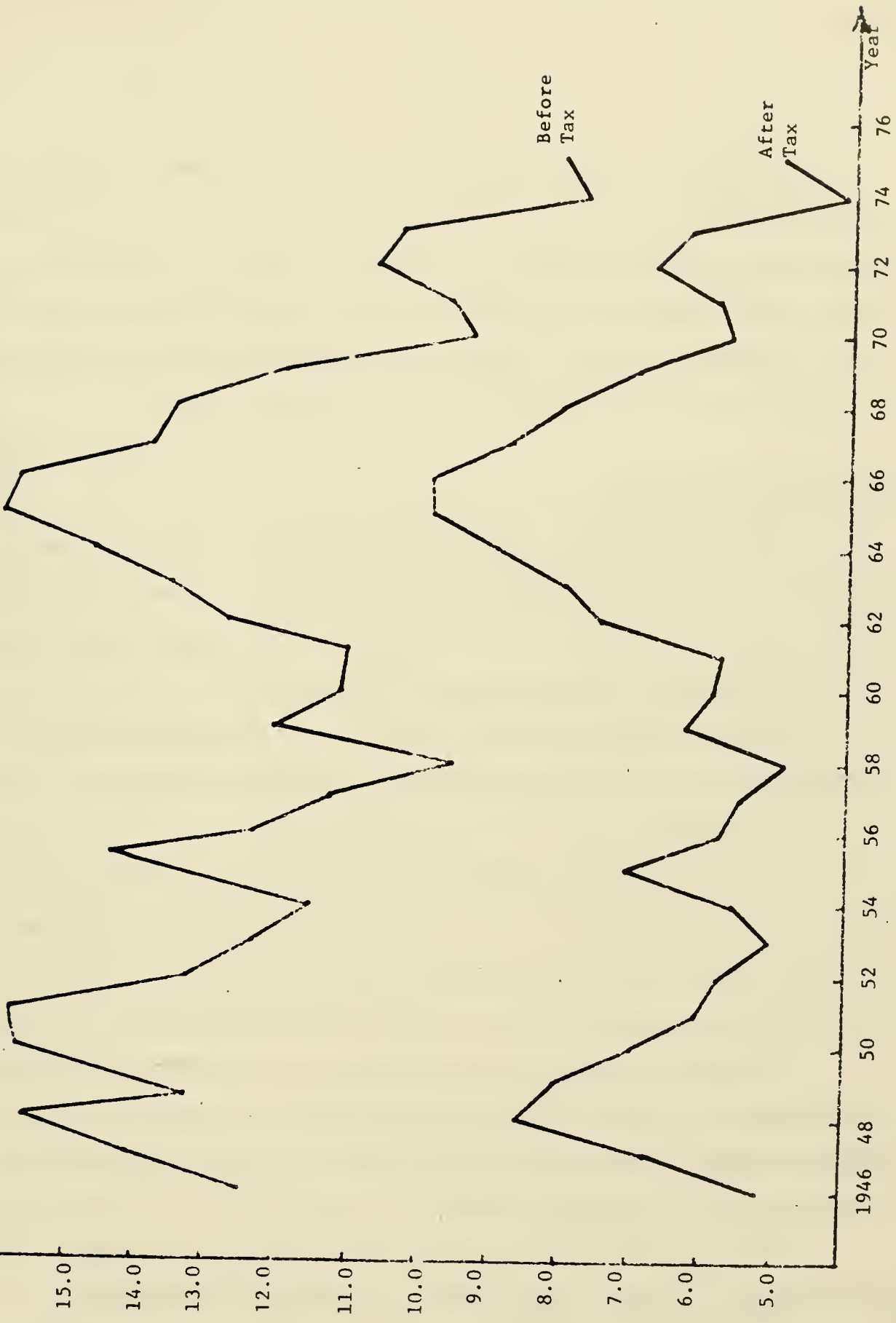
Source: Table 3

The last several years' ROC's are clearly the lowest in the table.
Was the decline from the peak of the mid-1960's so sharp as to carry ROC to
a new low level? It appears so. But this result cannot be vigorously de-
fended. It is based on a short run of years, and may be a transitory or
cyclical phenomenon. Later in this section we make a more careful attempt
to extract the trend, if there is any, from the before-tax ROC's.

After-Tax Rates of Return

Figure 3 and Table 3 also present after-tax ROC's for the same
periods. The after-tax ROC differs from its before-tax counterpart only in
that corporate income taxes are subtracted from operating income. Operating
income is defined after taxes, but includes interest.

Security prices are, of course, based on after-tax income. The
after-tax ROC is the "book" counterpart to R, the market rate of return
on all NFC securities.

The after-tax ROC is perhaps more pertinent than its before-tax
counterpart as evidence in the current debate on profitability. It measures
the actual reward to suppliers of capital, or, as some view it, the amount
available to finance new investment. Has the after-tax ROC tended to decline?

The three "episodes" observed for the before-tax ROC also character-
ize the after-tax figure. There are wide fluctuations around a 6.3 percent
mean from 1946-1960, then a sharp rise and fall in the 1960's. The average
is 5.6 percent for the period 1971-75.[16/]

Once again the rapid increase and sharp reversal in the 1960's is
the most prominent feature of the picture. One can surely conclude that
there was a burst of unusual profitability. In the 1970's, profit rates have

reverted to a level only slightly less than that of the 1946-60 period.
Visual inspection of Fig. 3 provides no clear evidence that after-tax ROC's
have dropped to a "new low." If there is a downward trend in profitability,
it appears more likely to be found in the before-tax figures. However, we
postpone a more careful search for trends until later in this section.

Taxes

The narrowing spread between before- and after-tax ROC's is ex-
plained by a downward drift in effective corporate tax rates. A general de-
cline started in the early 1960's and has persisted since, although not
without interruption.

Some of the decline is due to purposeful government policies --
the investment tax credit, permitting accelerated depreciation and shorter
asset lives under ADR guidelines, and permitting LIFO inventory accounting
for tax purposes. But a major part reflects NFC financing policy -- a grow-
ing proportion of debt finance -- and a condition imposed by capital markets
-- rising nominal interest rates.

Table 4 shows the growing importance of the interest tax shield.
We are now at a point where the tax deductibility of interest charges reduces
the effective tax rate on operating income by about 15 percentage points!
The right hand column of Table 4 shows what the effective rate of corporate
income tax would have been in the absence of the tax shield provided by NFC
debt. There is no evident downward drift in this hypothetical all-equity
rate.

Although the effective tax rate has drifted downwards in the
postwar period, the trend is by no means the whole story. Bursts of infla-
tion have sent tax liabilities sharply up and after-tax profitability
down. Hankin has found a significant

Table 4

EFFECTIVE TAX RATES ON OPERATING INCOME
OF NON-FINANCIAL CORPORATIONS 1946-1975

Year	Marginal Tax Rate	Effective Tax Rate	Tax Shield on Debt Interest as a Fraction of Before Tax Operating Income	Hypothetical All Equity Tax Rate
1946	38	58.1	1.8	59.9
1947	38	52.1	1.5	53.6
1948	38	44.2	1.3	45.5
1949	38	38.7	1.6	40.3
1950	42	55.4	1.2	56.6
1951	50.75	61.5	1.6	63.1
1952	52	56.5	2.0	58.5
1953	52	59.3	2.2	61.5
1954	52	51.7	2.8	54.5
1955	52	46.5	2.1	48.6
1956	52	46.0	2.3	48.3
1957	52	47.3	3.1	50.4
1958	52	48.5	4.3	52.8
1959	52	48.4	3.8	52.2
1960	52	46.9	4.4	51.3
1961	52	47.2	4.9	52.1
1962	52	41.7	4.7	46.4
1963	52	41.6	4.6	46.2
1964	50	38.7	4.3	43.0
1965	48	37.6	4.1	41.7
1966	48	37.5	4.5	42.0
1967	48	36.5	5.5	42.0
1968	52.8	40.9	6.5	47.4
1969	52.8	41.9	8.7	50.6
1970	49.2	39.8	12.2	52.0
1971	48	39.0	11.2	50.2
1972	48	36.8	10.1	46.9
1973	48	40.0	11.2	51.2
1974	48	48.1	15.7	63.8
1975	48	38.4	14.3	52.7

Source: Table 3 and Survey of Current Business, various issues. Marginal tax rates taken from Pechman [ ], p. 259.

negative correlation for the postwar period between after-tax ROC and the rate of inflation, after adjustment for a time trend and the rate of change of GNP. There was a strong positive link between inflation and the effective tax rate, but no significant link between inflation and the before-tax ROC.[17/]

The negative impact of price level increases on the after-tax ROC is no doubt due to the inclusion of nominal capital gains on inventory in taxable income and to the limitation of depreciation to historical costs.

Alternative Measures

Although we believe the estimates of ROC presented above will be widely accepted as reasonable and pertinent measures of profitability, many other measures are possible. Using the same underlying data base, other assumptions about depreciation patterns and service lives give different estimates. Also, different or expanded data bases could be employed. A definitive case in favor of the particular coverage and assumptions on which Table 3 is based cannot be made. Therefore we have developed a number of additional ROC estimates to check that the patterns we have found persits under alternative definitions.

Different depreciation patterns and service lives. In deriving Table 3 we used the "standard" NIPA estimates of capital stock and depreciation in current dollars. These estimates assume straight-line depreciation and service lives equal to 85 percent of those given in Internal Revenue Service Bulletin F.

The NIPA data base can be used to develop a number of alternative estimates. From this set we have chosen three. One assumes a different time pattern of depreciation -- double-declining balance. For another, different service lives are postulated -- 100 percent of Bulletin F up to 1940, a gradual decline to 75 percent from 1940 to 1960, and continuing at 75 percent from 1960 on. And for the third, "historical" values and costs are used.

These changes in underlying assumptions result in very different levels for operating income, capital stock and ROC. For mid-year 1970, for example, net capital stock of NFC's is $508 billion under the "standard" NIPA assumption. With double-declining balance depreciation it is $419 billion. Likewise in that year, the numerator in the ROC calculation -- after-tax profit plus interest -- is $41.3 in the "standard" case, and $36.6 billion with double declining balance depreciation. These dramatic differences do not carry through to the ROC, however. First, the denominator of the ROC calculation includes inventory as well as depreciable capital. Inventory is the same under all alternatives, so the denominators do not differ as much as the capital stocks alone. Second, differences in both numerator and denominator, being in the same direction, tend to offset. The ROC as calculated differs only slightly -- 5.7 percent for the standard case vs. 5.8 percent with double declining balance depreciation. ROC's both before and after tax under all three sets of assumptions appear in the first three columns of Table 5.$\underline{18/}$

Clearly, the general pattern of ROC behavior over time for the "standard" case also characterizes the series for double declining balance

Table 5

[1] ALTERNATIVE ESTIMATES OF RATES OF RETURN ON
INVESTMENT IN PLANT, EQUIPMENT AND INVENTORIES [2]
OF NON-FINANCIAL CORPORATIONS, 1946-72

Part I - Before Tax

Year	Standard Assumptions	Double-Declining Balance	Changing Depreciable Lives	"Historical" Cost
1946	12.5	14.2	11.1	23.5
1947	14.1	15.7	12.6	26.1
1948	15.6	17.2	14.1	24.7
1949	13.3	14.5	11.9	18.1
1950	15.7	17.3	14.1	25.5
1951	15.8	17.4	14.3	23.2
1952	13.3	14.6	12.0	18.4
1953	12.4	13.7	11.3	18.0
1954	11.6	12.8	10.6	16.2
1955	14.4	16.1	13.2	20.1
1956	12.4	13.7	11.3	18.4
1957	11.3	12.3	10.2	16.5
1958	9.6	10.5	8.6	13.8
1959	12.1	13.5	11.0	19.3
1960	11.2	12.5	10.2	14.9
1961	11.1	12.5	10.1	14.2
1962	12.8	14.4	11.7	15.7
1963	13.6	15.4	12.7	15.2
1964	14.7	16.5	13.8	16.8
1965	16.0	17.8	15.1	18.8
1966	15.8	17.5	15.1	18.7
1967	13.9	15.1	13.3	16.7
1968	13.6	14.9	13.2	17.2
1969	12.0	13.0	11.5	16.0
1970	9.4	10.1	9.0	13.4
1971	9.7	10.6	9.4	14.0
1972	10.8	11.8	10.5	15.5

Part II - After Tax

Year	Standard Assumptions	Double Declining Balance	Changing Depreciable Lives	"Historical" Cost	After Personal and Corporate Income Taxes
1946	5.2	5.8	·4.6	14.4	4.2
1947	6.8	7.2	6.0	16.5	5.7
1948	8.6	9.3	7.8	15.7	8.0
1949	8.1	8.6	7.3	11.5	7.5
1950	7.0	7.4	6.3	14.5	6.2
1951	6.1	6.4	5.4	11.0	5.3
1952	5.8	6.1	5.2	9.0	4.9
1953	5.1	5.2	4.5	8.9	4.3
1954	5.6	5.9	5.0	8.9	4.8
1955	7.1	7.7	6.4	11.3	6.3
1956	5.8	6.1	5.1	10.3	5.0
1957	5.5	5.7	4.8	9.5	4.7
1958	4.9	5.0	4.2	8.1	4.1
1959	6.3	6.8	5.5	9.6	5.4
1960	5.9	6.4	5.1	8.8	5.1
1961	5.8	6.4	5.1	8.2	4.9
1962	7.5	8.2	6.6	9.7	6.5
1963	8.0	8.8	7.1	10.0	6.9
1964	9.0	10.0	8.2	11.0	8.0
1965	9.9	10.9	9.2	12.3	8.9
1966	9.9	10.7	9.2	12.2	8.8
1967	8.8	9.3	8.2	11.1	7.7
1968	8.1	8.5	7.6	10.9	6.9
1969	7.0	7.2	6.4	10.3	5.7
1970	5.7	5.8	5.2	9.0	4.6
1971	5.9	6.2	5.5	9.5	4.9
1972	6.8	7.2	6.4	10.8	5.8
1973	6.3	--	--	--	5.2
1974	4.1	--	--	--	2.9
1975	5.0	--	--	--	3.9

Notes for Table 5

Part I

Standard Assumptions are explained in notes for Table 3.

Double-Declining Balance differs from Standard Assumptions by estimating depreciation on a declining balance formula at twice the straight-line rates. See Tables A2b and A4b.

Changing Depreciable Lives differs from Standard Assumptions in employing a pattern of asset lives declining over time from 100 percent to 75 percent of Bulletin F lives to estimate depreciation, whereas the Standard Assumptions use a constant 85 percent of Bulletin F. See Tables A2c and A4c.

Historical Cost differs from Standard Assumptions in that it approximates book avlues rather than replacement costs. In particular, there is no Inventory Valuation Adjustment, and the capital stock is valued at cost when initially acquired. See Table A2d and A4d.

Part II

All the measures in Part II are net of corporate income taxes. In deriving After Personal and Corporate Income Taxes, an estimate of the federal income taxes paid by recipients of the dividends and net interest payments of Non-Financial Corporations is also subtracted.

We based our estimate of the Federal personal income tax on two empirical regularities:

1. From 1947-1974, total personal income tax liability was a rather constant fraction of total Adjusted Gross Income -- typically 10-13 percent. (See Joseph A, Pechman, [17a],p. 323 and 326 for underlying data.)

2. Over the period 1947-57, the weighted average effective rate of personal income tax on aggregate dividends (National Income Total) ran about twice as high as the rate on total Adjusted Gross Income (See Daniel M. Holland, [9a], p. 112 for relevant data.)

Therefore, for the period 1946-75 we assumed the effective rate on dividend receipts to be twice that on total Adjusted Gross Income. (We took the 1947 rates to hold for 1946, and 1974 rates to apply in 1975.) Given that a large fraction of corporate bonds is held by non-taxable (or lightly taxed) intermediaries, the effective rate on interest should be lower than that on dividends, but higher than that on total Adjusted Gross Income. We took the effective rate of tax on interest to be equal to that on Adjusted Gross Income plus one half the difference between the dividend rate and that on Adjusted Gross Income.

Notes for Table 5 (continued)

Further personal income tax could be due in an ensuing year on the real-
ized capital gains due to the earnings retained in a given year. Our
estimates take no account of this. But the distortion is likely to be quite
small. A good fraction of corporate earnings "belong" to non-taxable
owners, and most of potentially taxable capital gains do not appear to be
taxed. See Bailey [1a], p. 38.

depreciation and changing depreciable lives. Double declining balance gives ROC's slightly higher than "standard," changing depreciable lives slightly lower. But all three have the same general configuration over time.

Among them these three encompass the range of all reasonable possibilities.   The "standard" case comes out in about the middle.

Historical Cost Accounting. -- The ROC measures given in the fourth column of Table 5 are intended to approximate NFC profitability as it would be measured under currently accepted accounting conventions. This "historical cost" series includes inventory profits in income, measures depreciation on an historical cost basis, and uses the book value (that is, the historical cost of acquisition) of the capital stock. Thus the numerator of the historical cost ROC calculation is overstated because inventory profits are included and depreciation understated. The denominator is understated because the historical acquisition cost of capital stock is below the current cost of replacement. Thus the historical cost ROC overstates real profitability.

The historical cost ROC is not a reasonable measure of real return. Nor can anything of substance be inferred from its behavior over time. But it is interesting nevertheless, because it shows the rough magnitude of error that would be introduced by measuring NFC profitability from corporate accounts.[19]

Effects of Personal Income Taxes. -- All the ROC's reported in Part II of Table 5 are defined after corporate income taxes. For the last column we have also subtracted an estimate of the personal income tax due from recipients of

the net interest and dividends paid by NFC's. The estimating procedure, explained in the Notes to Table 5, simply approximates the additional tax. For our purposes it suffices, however. While the after-tax ROC in the last column is, of course, lower, the pattern over time is similar to the pattern shown by other ROC measures.[20]

Augmented Capital Stock. -- The ROC estimates presented thus far compare NFC operating income to the net reproduction cost of plant, equipment and inventory. But business firms also hold stocks of cash and accounts receivable, and invest in land and various other assets. We were able to obtain estimates of the aggregate value of their items from the Treasury Department's Statistics of Income.[21] Table 6 shows ROC's computed on this augmented base. These ROC's are uniformly lower than those presented in Table 3, because the capital base is increased. The ratio of the augmented to the standard base has no clear trend over time, however, so the pattern of ROC's in Table 6 is about the same as in Table 3.[22]

Holding Gains on Capital Stock and Inventory. -- As we have pointed out, our measures of ROC include only operating income. That is, they exclude real holding gains, if any, on NFC capital stock and inventories. This is an accurate assumption if the net reproduction cost of capital stock and inventories increases at exactly the same rate as prices generally.[23]

Of course holding gains and losses are automatically included in rates of return measured from capital market data. But they are more difficult to extract from the National Income and Product Accounts (NIPA). However, a tolerable approximation can be made if the NIPA figures for net replacement costs of capital stock and inventories are assumed to be reliable

Table 6

RATES OF RETURN ON AUGMENTED BASE FOR
NON-FINANCIAL CORPORATIONS, 1947-75[1]

Year	Before-Tax Rate of Return	After-Tax Rate of Return
1947	12.3	5.9
1948	13.7	7.7
1949	11.7	7.2
1950	13.9	6.2
1951	14.2	5.5
1952	12.4	5.4
1953	11.5	4.7
1954	10.5	5.1
1955	13.0	6.4
1956	11.3	5.3
1957	10.2	5.0
1958	8.6	4.3
1959	10.9	5.6
1960	10.1	5.4
1961	10.0	5.3
1962	11.5	6.7
1963	12.3	7.2
1964	13.0	8.0
1965	14.4	8.9
1966	14.1	8.8
1967	12.4	7.9
1968	12.1	7.2
1969	10.7	6.2
1970	8.5	5.1
1971	8.8	5.4
1972	9.7	6.2
1973	9.5	5.7
1974	7.1	3.7
1975	7.4	4.5

[1] Calculated as in Table 3, except that the capital stock is defined as including all non-financial assets. The denominator was taken from Table A4, Column 7, rather than from Table A2.

estimates of these assets' actual market values. Our procedure was as follows.

1. Net replacement cost of NPC capital stock is given both in current and constant dollars. The difference between the rate of increase of these two series is the rate of increase in the nominal value of a typical collection of the capital goods held by NFC's. This rate of increase was   converted to real terms. (See Appendix Table A6.)

2. The Department of Commerce publishes an inventory valuation adjustment (IVA) for NFC's. The IVA is an estimate of nominal holding gains on NFC inventories. We calculated annual estimates of the nominal holding gain that would be just sufficient to offset inflation. This figure is then subtracted from the corresponding year's IVA to obtain an estimated real holding gain. (See Appendix Table A7.)

The results are displayed in Table 7. Although the average holding gain for the entire 1946-75 period was quite small (only .02 percent), there were substantial gains and losses in particular periods. Holding gains were positive on average up to 1957, then negative in every year but one from 1958 to 1971. There have been large positive holding gains from 1972 to 1975.

ROC's with and without holding gains are compared in Figure 4. Including holding gains increases the volatility of the ROC's, especially in the 1940's and 1950's. The volatility of the rates of return actually realized by investors was still greater, however -- compare Tables 1 and 7.

The decline in NFC profitability since the mid-1960's is less severe, but still apparent when real holding gains are included in ROC.

Table 7

ESTIMATED REAL HOLDING GAINS ON CAPITAL STOCK AND

INVENTORIES OF NON-FINANCIAL CORPORATIONS, 1946-72

| Year | Estimated Real Holding Gains | | | Percent of Standard Base | After-Tax ROC with Holding Gains |
	Capital Stock	Inventory	Total		
1946	-4.0	-7.5	-11.5	-9.7	-4.5
1947	3.2	-1.0	2.2	1.5	8.3
1948	3.3	.1	3.4	2.0	10.6
1949	2.2	-.5	1.7	1.0	9.1
1950	4.2	.3	4.5	2.3	9.3
1951	-4.6	-4.1	-8.7	-4.0	2.1
1952	7.8	-1.9	5.9	2.5	8.3
1953	1.3	.4	1.7	.7	5.8
1954	3.6	3.5	7.1	2.6	8.2
1955	9.3 ·	1.3	10.6	3.8	10.9
1956	7.4	-.4	7.0	2.3	8.1
1957	.7	-1.8	-1.1	-.3	5.2
1958	-1.0	-1.6	-2.6	-.8	4.1
1959	-1.2	-1.2	-2.4	-.7	5.6
1960	-3.7	-2.0	-5.7	-1.6	4.3
1961	-2.5	-1.0	-3.5	-.9	4.9
1962	-2.8	-1.6	-4.4	-1.1	6.4
1963	-3.5	-2.0	-5.5	-1.4	6.6
1964	-.5	-1.3	-1.8	-.4	8.6
1965	1.0	-.9	.1	0	9.9
1966	-.4	-3.3	-3.7	-.7	9.2
1967	2.8	-3.6	-.8	-.1	8.7
1968	1.7	5.4	-3.7	-.6	7.5
1969	.4	-6.4	6.0	-.9	6.1
1970	1.3	5.9	4.7	-.6	5.1
1971	6.8	-2.0	4.8	-.6	5.3
1972	8.9	-.5	8.4	1.0	7.8
1973	5.7	-.9	4.8	.5	6.8
1974	15.8	11.8	27.6	2.4	6.5
1975	24.6	4.4	29.0	2.3	7.3

Sources: Estimated real holding gains on capital stock and inventory are from Appendix Tables A5 and A6 respectively. These figures are totalled for each year and divided by the "standard base" -- i.e., by the sum of average capital stock and mid-year inventory in current dollars. See Appendix Table A3a.

Figure 4: AFTER TAX RATE OF RETURN
WITH AND WITHOUT REAL HOLDING GAINS, 1946-75
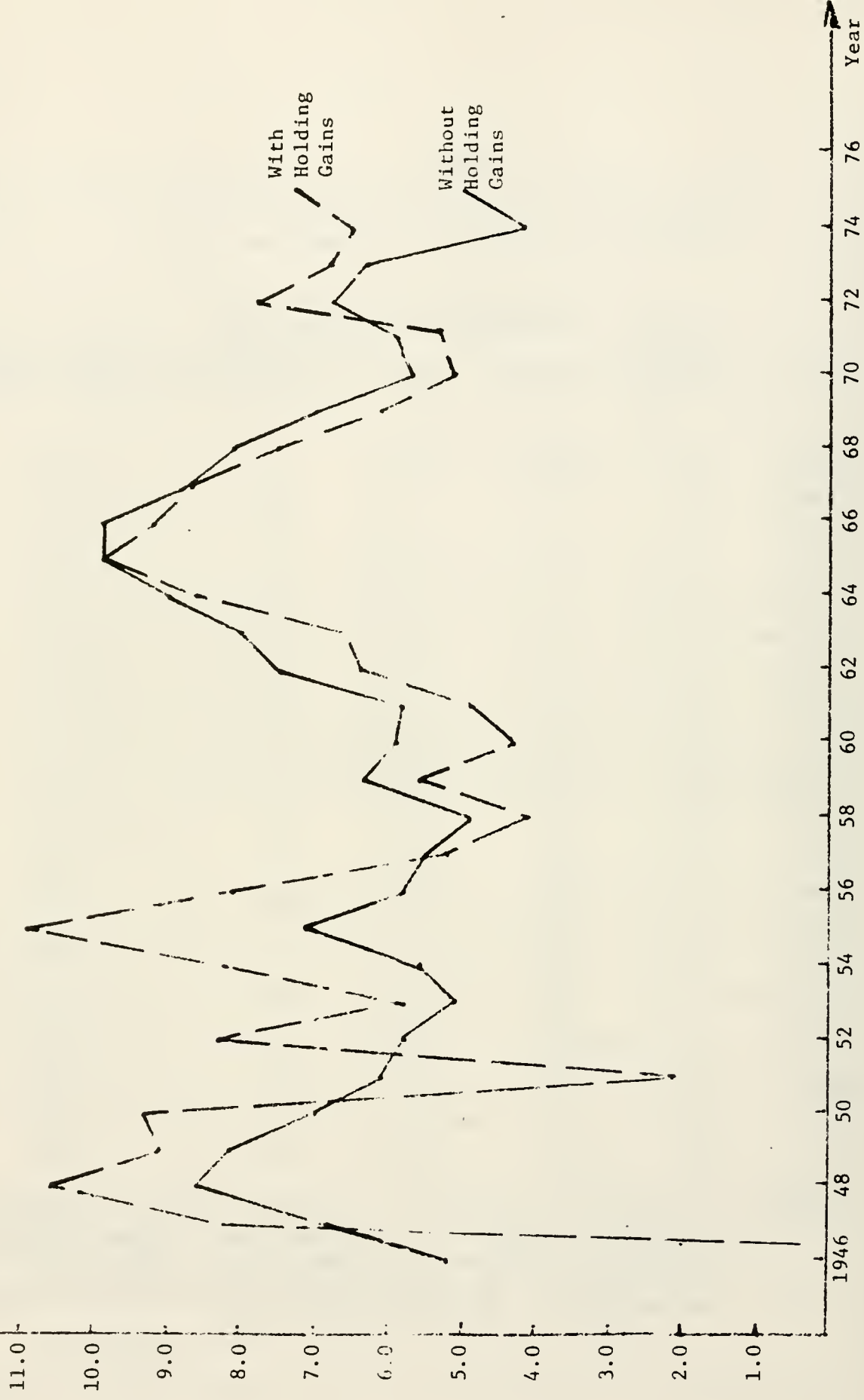
It becomes much more difficult to make sense of the 1946-65 period. We are not convinced that year-to-year fluctuations in real holding gains measured from the NIPA have much significance for the issues considered in this paper.[24/]

Summary. -- We believe that any conclusions about the pattern of ROC over time will remain valid over a wide range of alternative measures.

Comparing Alternative Profitability Measures

In Table 8 we list means and standard deviations for all the ROC series developed in our study, and for R, the real rate of return earned by investors in NFC's. Comments on these alternative measures follow.

1. The average "standard" after-tax ROC was 6.8 percent for 1929-75. It was virtually the same (6.7 percent) for the 30 years since the end of World War II. (See lines 1 and 2 in Table 8.) The larger standard deviation for the longer series reflects the more volatile economic experience of the depression and the War.

2. Similarly, R, the real return earned by investors, averaged substantially the same for the post-war years as for the longer time period. (Lines 11 and 12.)

3. Moreover, both measures of return -- on corporate assets on the one hand and on corporate ownerships and claims on the other -- were of the same order of magnitude (Lines 1, 2, 4, 11, 12 and 13). It is comforting, but not surprising, to end up with this result. In the long-run a congruence between the average returns on corporate securities and on corporate investment is to be expected. In shorter periods, of course, the two returns can be widely divergent, as the very different standard deviations suggest.

TABLE 8

Mean Values and Standard Deviations of
Rates of Return Series

(percent per year)

Series	Mean	Standard Error of Estimated Mean	Standard Deviation of Series
1. ROC(AT): Standard Case, 1929-1975	6.80	0.37	2.54
2. ROC(AT): Standard Case, 1946-1975	6.72	0.28	1.53
3. ROC(AT): After Corporate and Personal Taxes, 1946-1975	5.77	0.27	1.48
4. ROC(AT): Standard Case, 1947-1975	6.77	0.28	1.51
5. ROC(AT): Augmented Base, 1947-1975	6.04	0.25	1.35
6. ROC(AT): Standard Case, 1946-1972	6.90	0.28	1.46
7. ROC(AT): Double-Declining Balance, 1946-1972	7.36	0.32	1.66
8. ROC(AT): Changing Depreciable Lives, 1946-1972	6.22	0.27	1.40
9. ROC(AT): "Historical Cost," 1946-1972	10.85	0.43	2.24
10. ROC(AT): Standard Case with "Holding Gains," 1946-1975	6.74	0.54	2.96
11. Real Return Earned by Investors in NFC's, 1929-1975	5.73	2.52	17.29
12. Real Return Earned by Investors in NFC's, 1946-1975	6.00	3.05	16.71
13. Real Return Earned by Investors in NFC's, 1947-1975	7.06	2.96	15.96
14. ROC(BT): Standard Case, 1929-1975	12.07	0.72	4.94
15. ROC(BT): Standard Case, 1946-1975	12.50	0.42	2.30

4. The most appropriate series for comparison with R is the after-tax ROC for the Augmented Base (Lines 5 and 13). The important point is that the two series have averages of the same order of magnitude. The percentage point difference between them -- a slightly higher rate of return to investors than to corporate assets -- is not statistically significant.

5. In all likelihood, the "true" average after-tax ROC is between 6 and 7 percent -- the range encompassed by the set of alternative measures (Lines 6, 7, 8 and 10).

6. It is particularly interesting to find a virtually identical result for the standard base ROC whether or not real holding gains on corporate assets are included in earnings (Lines 2 and 10). Over the Post-War period these capital gains and losses have just about cancelled out. The ROC defined to include "holding gains" is, of course, a more volatile measure, with a standard deviation about twice as high as our "standard" ROC.

7. That prevailing accounting conventions provide seriously misleading evidence on real corporate profitability is highlighted by the "historical cost" results. This measure, which averaged more than 4 percentage points higher than the correct results, gives a rate of return that is 60 percent too high (Lines 6 and 9).

8. Over the past 30 years, the before-tax ROC averaged 12.5 percent. The difference between before and after-tax ROC's (Lines 15 and 2 of Table 8) reflects the effective corporate tax rate. On average, government received 46 percent of NFC operating income in corporate taxes. We remind the reader, however, that the effective tax rate has tended to decline in the period 1946-1975.

9. Additional taxes were levied on the NFC operating income upon

its distribution to individual claimants. Taking account of the personal income tax as well as the corporate income tax reduces the ROC by one percentage point (Line 3), and indicates that the government has taken. the lion's share of operating income over the post-war period, 54 percent.

Searching for Trends

Nordhaus characterized the behavior of postwar ROC's as "a definite downtrend from 1948 to the middle 1950's; a dramatic recovery from the late 1950's to the mid-1960's; and a deterioration to a plateau by 1970."[25]

He interprets this behavior as a postwar downtrend in corporate profitability, reflecting a steady decline on the opportunity cost of capital.[26]

This is not so clear to us. First, it is too easy to see a post-1948 downward trend in Nordhaus's figures. In 1948 ROC was at a cyclical peak, well above the ROC's for 1946 and 1947. The downward trend is not so obvious if one starts in 1946. Second, recent data revisions reduce the ROC estimates for the period 1948-62. The reduction is .7 percentage points for 1948, and roughly .2 percentage points for most years before 1962.[27] Third, the revisions increase ROC after 1964.

Figure 5 compares the ROC's estimated by Nordhaus to our "standard" ROC.[28] Nordhaus's figures are based on unrevised data for the period 1948-73. The data on which our ROC estimates are based were recently revised and extended. (We have not plotted the revised series for the whole period. The ROC's from 1949 to 1965 are too close to distinguish.) Inspection of Tables 5 and 3 leads us to doubt the existence of any secular downward trend in ROC.

COMPARISON OF RATES OF RETURN FOR ORIGINAL AND REVISED DATA

25a
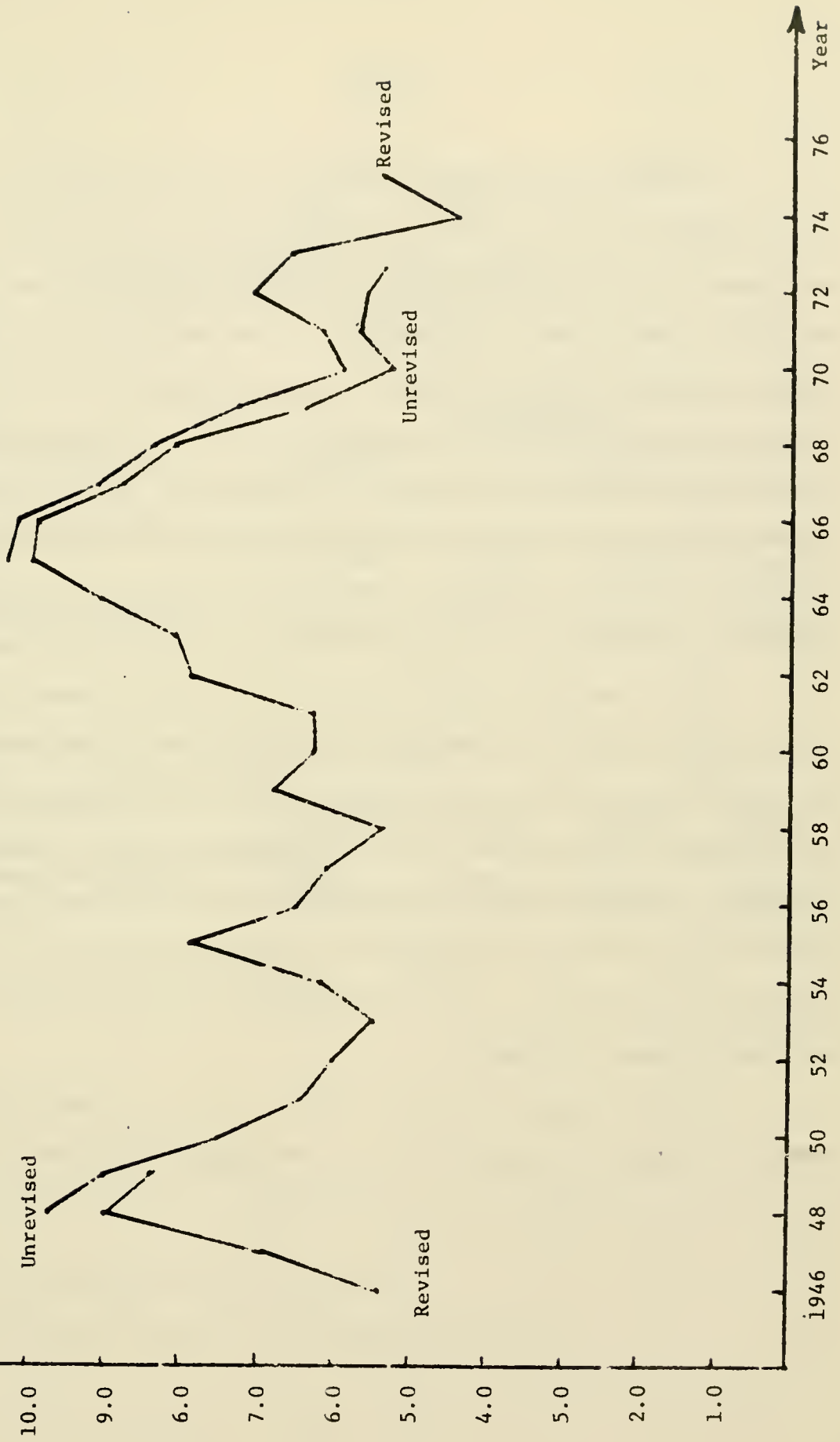
We admit that it might be difficult to see a downward trend even if it existed, given the volatility and cyclicality of the ROC series. Thus, we attempted a more elaborate statistical test based on recent work by Hankin.[29/] Table 9 reports the results of a regression of ROC on time, the change in real GNP and the inflation rate. A Cochrane-Orcutt iterative technique was used to adjust for severe auto-correlation. The ΔGNP variable corrects for business cycle effects, and the inflation variable corrects mainly for the impact of inflation on the effective tax rate.[30/] Notice that the coefficient of time in the postwar regression for after-tax ROC is positive although not significant. The other coefficients offer no surprises.

We do have one puzzle. Table 4 seems to show a downward trend in the effective tax rate. If that trend is accepted, then we can hardly rule out trends in both the before and after-tax ROC's. But if there is a trend in one ROC measure, which measure is it? Inspection of Figure 3 suggests a downward trend in the before-tax ROC and no trend in the after-tax figure. Table 9 suggests, if anything, an upward trend in the after-tax ROC, and no trend in the before-tax figure. We end up doubting that any trends exist -- although that doesn't square with Table 4.

No doubt fancier statistical tests could be devised. But Table 9 gives no evidence whatsoever for a secular downward trend in the after-tax ROC.

Table 9

REGRESSION COEFFICIENTS: ROC vs. TIME,

ECONOMIC GROWTH AND INFLATION

Period	Measure	Coefficient			
		Constant	T	ΔGNP	ΔP
1929-75	After-Tax ROC	5.60 (7.84)	.026 (.51)	.227 (7.96)	.045 (1.08)
	Before-Tax ROC	12.7 (2.73)	-.151 (-.62)	.348 (9.53)	.098 (1.86)
1947-75	After-Tax ROC	5.93 (10.54)	.116 (1.78)	.183 (5.13)	-.195 (-3.76)
	Before-Tax ROC	10.5 (11.3)	-.083 (-.82)	.341 (8.15)	.049 (.819)

Variable Definitions

1. ROC's were taken from Table 3.

2. T is a linear time trend, standardized so that the mean of T
    is zero.

3. ΔGNP is the percent change in real GNP.

4. ΔP is the percent change in the Consumer Price Index.

IV. THE LINK BETWEEN REAL AND FINANCIAL MARKETS

Introduction

We have now examined both real and financial measures of NFC performance -- ROC and R, respectively. To a great extent they tell the same story. But further insights depend on a linking up of the real and financial sectors. The most important specific issue is how real rates of return have behaved relative to capital costs.

It is difficult to measure the opportunity cost of capital directly, since it is defined in terms of _expected_ returns on debt and equity securities. There is no simple way to infer expectations from historical returns.[31/]

But there is an alternative approach which is superior in most respects. It is based on comparisons of the aggregate market value of corporate securities with the value of real capital held by corporations.

Modern financial theory shows that the market value of a firm (MV) equals the capitalized value of the long-run average earnings from assets now in place (Y/ρ), plus the present value of growth opportunities (PVGO).[32/]

$$MV = \frac{Y}{\rho} + PVGO \qquad (2)$$

The capitalization rate ρ is the equilibrium expected rate of return established in capital markets for this firm and others of equivalent risk.

Earnings are equal to the return on capital times real capital (RC). Thus $Y = ROC(RC)$, and

$$MV = RC\left(\frac{ROC}{\rho}\right) + PVGO . \qquad (3)$$

PVGO is the present value of future opportunities to invest at rates of return in excess of the cost of capital. Growth is worth nothing if expected ROC on future investment just equals ρ. If ROC = ρ now and for the future, the market value of the firm just equals the value of its real capital.

Thus q, the ratio of MV to RC, depends on the ratio of ROC to ρ:

$$q \equiv \frac{MV}{RC} = \frac{ROC}{\rho} + \frac{PVGO}{RC} , \tag{4}$$

where PVGO is a function of ROC/ρ and the rate of expansion of real capital stock.

Estimates of q can provide useful insights into whether the rate of return on real capital has declined relative to the cost of capital. If, for example, we observe that q has declined, then we can conclude that ROC has declined relative to ρ.[33/] Moreover, we can say this with reasonable confidence, since MV and RC, the determinants of q, are liable to less serious measurement errors than ROC or ρ.

The methodology just outlined cannot provide specific estimates of the rates of return or the cost of capital for any particular year. But the approach should permit us to identify changes in the spread between present and anticipated future profitability, on the one hand, and capital costs on the other. We believe this is the more relevant comparison. For example, it bears directly on the concern that the falling rate of return reduces the incentive to invest.[34/]

To summarize, changes in q over time for the NFC sector should provide a clear measure of how present and anticipated rates of return on real capital have behaved relative to the cost of capital.

The Behavior of q and ROC over Time

The time series of q_t for non-financial corporations is presented and discussed in Section II of this paper. It is replotted in Figure 6.[29] We see again that the early and mid-1950's were an unfavorable period relative to the mid-1960's. Investors in 1965 must have anticipated ROC's well in excess of the opportunity cost of capital, ρ. Since 1965 there has been a clear downtrend in q, however, which we can now interpret as a decline in the ratio ROC/ρ.

What accounts for the fluctuations in q? It is difficult to say, since we lack a reliable estimate of ρ. But the data strongly suggest that changes in q since the late 1950's are mostly responses to changes in ROC. As Figure 6 shows, the year-to-year movements of q and ROC correspond closely after 1958.[35] There is no such obvious relationship before 1958.

This interpretation is reinforced by Figure 7, which shows the ratio of NFC operating income to market value for the period 1946-75. This ratio can be thought of as a generalized earnings-price ratio where "price" equals MV and "earnings" equals real operating income. There is no evident trend in this ratio since the mid-1950's, and its volatility since then has been much less than in the first postwar decade.

The ratio of operating earnings to MV is as close as we can get to a direct estimate of the real cost of capital ρ. In principle we should estimate

$$\rho_t = \rho_t(D)\left(\frac{MV_t(D)}{MV_t}\right) + \rho_t(E)\left(\frac{MV_t(E)}{MV_t}\right) \quad . \quad (5)$$

Eq. (5) corresponds to Eq. (1), except that the ρ's are _expected_ rates of return -- e.g., $\rho_t = E(R_t)$. Now, _if_ the total expected _dollar_ return to debt and equity is just equal to Y_t, i.e.,

FIGURE 6. THE RELATIONSHIP OF ROC AND P.
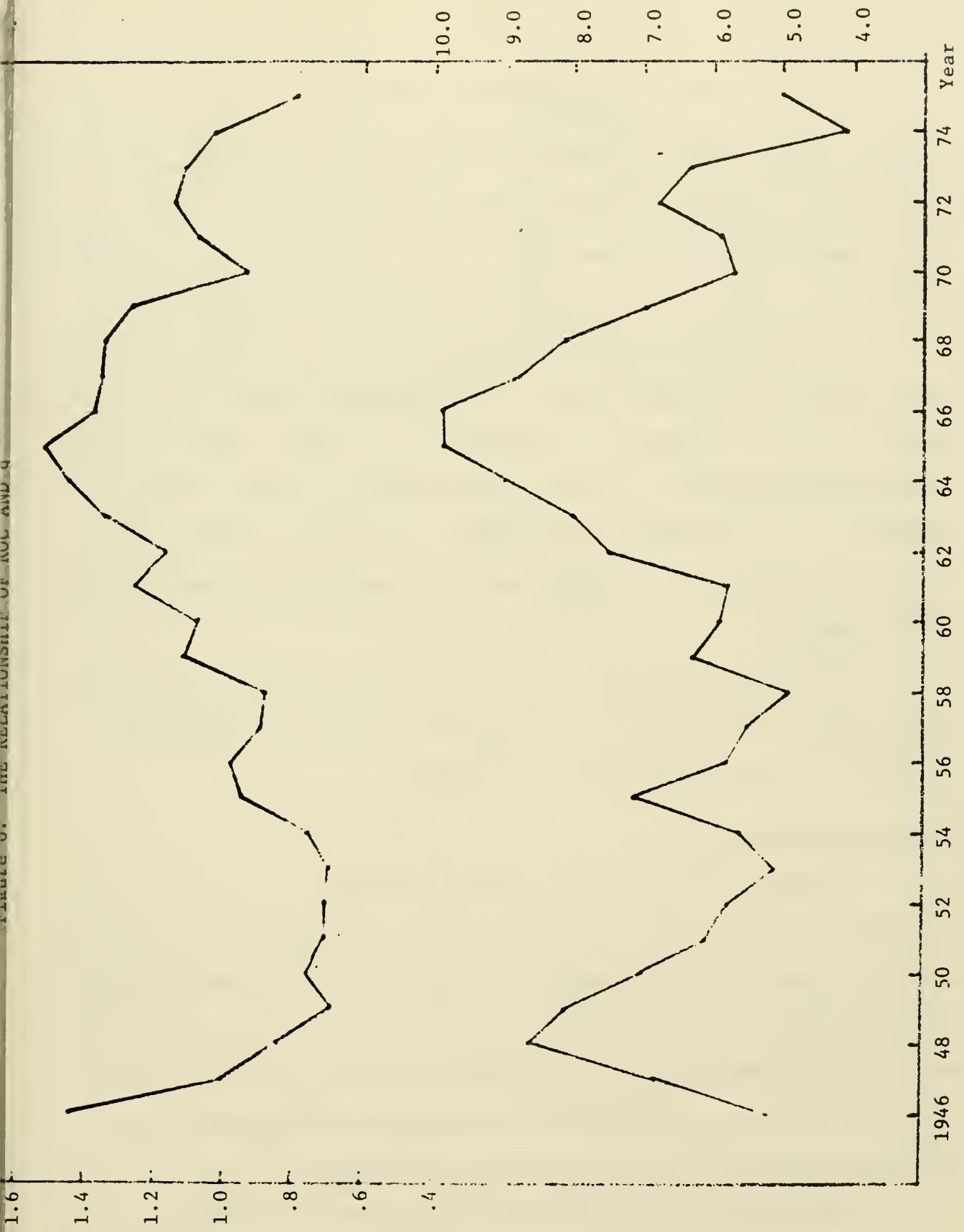
$$\rho_t MV_t \quad = \quad \rho_t(D)NV_t(D) + \rho_t(E)MV_t(E) \quad = \quad Y_t, \qquad (6)$$

then $\rho_t = Y_t/MV_t$, which is the ratio plotted in Figure 7. Unfortunately, Eq. (6) makes a number of implicit assumptions. For example, it holds only if growth opportunities are absent (PVGO = 0) and if Y_t equals investors' expectations of average future earnings generated by assets held at t.

Nevertheless, if we can take the ratio as a rough estimate of ρ, we must conclude that ρ declined steadily from its postwar peak in the late 1940's. Since 1956 it has fluctuated in a range from five to seven percent,[36/] which matches the average ROC (AT) over the postwar period. Morover, since the ROC (AT) over the entire postwar period, has shown no trend, it appears that the rate of return on corporate assets has matched the weighted average cost of capital.

We conclude, therefore, that the decline in corporate real profitability (ROC) over the last decade has not been matched by a corresponding decline in the real opportunity cost of capital.

The Absolute Value of q

As Figure 6 shows, q has averaged approximately 1.0 over the last few years. (For 1976 it is probably back up to at least 1.0). One is tempted to conclude that NFC's are earning just enough to cover the opportunity cost of capital (ROC = $\bar{\rho}$). But any such conclusion must be cautiously held. For one thing the Standard Base does not include some assets. Although changes in q are, we believe, a reliable signal of changes in ROC relative to ρ, the absolute value of q is a less trustworthy statistic.

Nevertheless, it is difficult to see how the "true" value of q could be much in excess of 1.0. If q is computed on the augmented capital base, for

Operating
Income to
Market Value
(percent)

10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0

1946 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76   Year
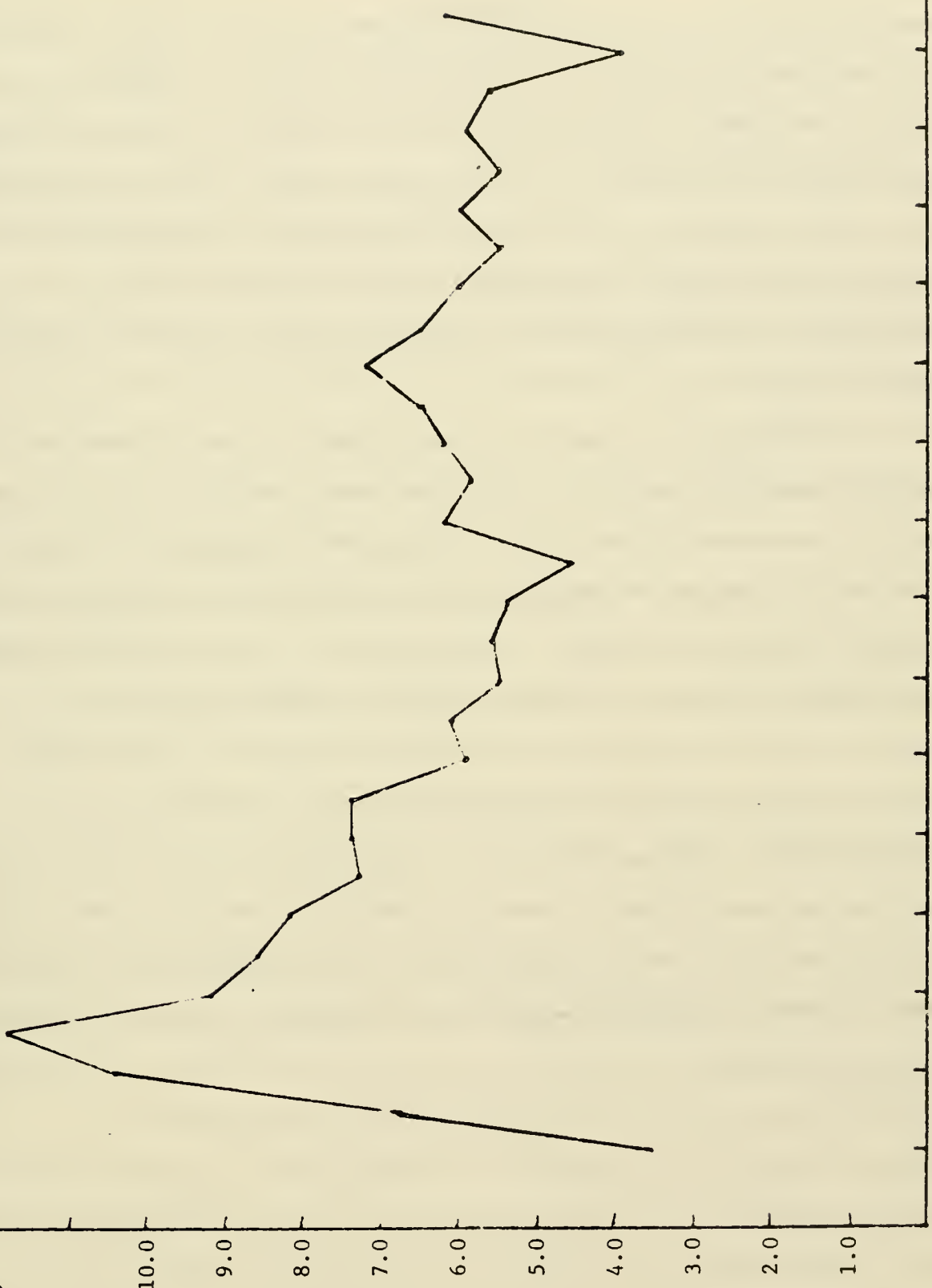
example, then its 1975 value becomes .73 rather than .80. Even the augmented base may be an underestimate of the replacement cost of all corporate assets. We know, for example, that the augmented base includes only the book value of land, not its current value. It is true that q would be higher if accelerated rather than straight-line depreciation had been used in estimating the net replacement cost of plant and equipment. But the combined use of accelerated depreciation and the augmented base would not generate a value for q much in excess of 1.0.

Where are the intangible assets, the growth opportunities, and the monopoly rents? Apparently, in the last few years they count for very little when NFC's are examined in aggregate. We found this surprising. Financial economists are accustomed to pointing out the assets that accountants to not recognize -- going-concern value, the fruits of past research and development, product repuation, and so on. They have come to think of growth firms as an important part of our economy. They believe that some firms have monopoly power. In each case they can cite firms as examples to back up their beliefs. Yet these firms are evidently atypical. Judging from q, there is little evidence that intangible assets, growth opportunities, and monopoly rents have a significant impact on the current value of NFC's, although one or more of these effects must have been important in the mid-1960's, and also in earlier periods, e.g. 1934-39.

V. CONCLUSION

There is no question that NFC's have fared poorly since the mid-1960's. The fact is obvious from the low real rates of return realized by investors in NFC's. The poor performance is confirmed by declining operating profitability over the same period.

Whether the most recent data are viewed optimistically or pessimistically depends on which past period is taken as "normal." The evidence is that in the mid-1960's NFC's real profitability was much higher, relative to the opportunity cost of capital, than it is now. On the other hand, NFC's are better off now than in the mid-1950's. Operating profitability (ROC) is about the same now as then, but the cost of capital is lower. (If there is a capital "shortage," it has as yet had no observable effect on the cost of capital.)

Over long periods -- 1946-75, or 1929-75 -- we have found no trend in the after-tax rate of return on corporate assets.

In the last few years the aggregate market value of NFC's was at most equal to the net replacement cost of all NFC assets. There was no evidence that capital markets in recent years perceived NFC's as having, in aggregate, substantial intangible growth opportunities. In short, the evidence we have presented gives no basis for concluding that current or anticipated ROC's on NFC assets exceed the current opportunity cost of capital.

It seems reasonable to say that the real cost of capital for NFC's has been about 6 to 7 percent since the late 1950's. The average long real profitability of NFC's has also been 6 to 7 percent. In the period from 1929 up to the late 1950's, the annual cost of capital was a volatile series. Since then fluctuations in market value have been more closely related to variations in profitability than to shifts in the costs of capital.

FOOTNOTES

1. This report incorporates research sponsored by M.I.T.'s Project on
    International Business and by the Committee for Economic Development.
    We are grateful to the sponsors for their support, and to Fischer Black,
    Jack Ciccolo, Everett Hagan, John Gorman and Allen Sinai for their help
    in acquiring necessary data and working out methodological issues. We are
    especially indebted to Sudipto Bhattacharya, Robert Jarrow and Richard
    Weiss, our research assistants on this project, and to Roger Hankin for
    allowing us to rely on his research on the link between corporate profita-
    bility and inflation [9].
    The authors take full responsibility for errors, however.

2. The stock market's valuation of growth firms like IBM, Hewlett-
    Packard, Digital Equipment Corporation, or Eastman Kodak can only be
    explained by the present value of profitable future investment oppor-
    tunities. Current earnings are insufficient to account for these firm's
    values, even if capitalized at high-grade bond yields.

3. See, for example, Jensen's study of mutual fund performance [11] and
    other evidence summarized by Fama [7].

4. For evidence, see Lorie and Hamilton [14], Fama's review article [7],
    and the articles collected in Lorie and Brealey [13].

5. There is no reason for the relative past performance of stocks and bonds
    to affect firms' capital investment decisions, for example.

6. R_t does not, however, measure the return earned by the government via
    taxation. In a sense MV_t understates the value of NFC's, because it
    does not include the present value of future taxes.

7. We have followed procedures worked out by John Ciccolo, Jr. in [4].
    We are grateful for his assistance.

8. The portfolio was constructed by Ibbotsen and Sinquefield [10].
    This portfolio's maturity undoubtedly overstates the average maturity
    of NFC debt. Consequently, the mean and volatility of our estimate
    of $R_t(D)$ are overstatements of the true mean and volatility. Ibbotsen
    and Sinquefield found that both mean return and volatility have in-
    creased with bond maturity. See [10], Table 9, p. 40.

9. We are <u>not</u> implying that there are meaningful "trends" or "cycles" in
    the rates of return shown in Table 1. It is not possible to predict
    future R_t's from the historical figures shown. No investor standing
    at any point in the 1947-75 period could have used the R_t's observed
    up to the point to predict future R_t's. It is only hindsight that allows
    us to interpret the history of rates of return.

10. Often referred to as "Tobin's q." James Tobin has emphasized the im-
    portance of this ratio and employed it in theoretical and empirical
    work. See, for example, [20] and [22]. See also the 1977 <u>Economic</u>
    <u>Report of the President</u> [6], pp. 28-29.

11. CS_t is an average of starting and ending values of NFC capital stock and
    inventories. Thus CS_{1950} is a simple average of figures for the end of
    1949 and the end of 1950. MV_t is estimated as of mid-year -- the end of the
    second quarter of year t. This convention facilitates comparison of q
    to the rate of return measures presented in Section III below. Unfor-
    tunately, it also makes it difficult to match year-by-year fluctuations in
    q and R, since R_t is based on market values computed at the <u>end</u> of calendar
    years. We do not attach much significance to any single year's value of
    q_t or R_t, however.

12. [6], p. 28.

13. This statement is strictly true only in a partial equilibrium analysis.

14. Nordhaus [17] and Terborgh [19] in particular.

15. We are indebted to John A. Gorman, Assistant to the Associate Director for National Income Accounts, for supplying these revised data prior to their publication in the Survey of Current Business.

16. Remember that the ROC's shown in Table 3 are intended as measures of real, not monetary, rates of return. They should be compared to the real R's in Table 1, and to real, not nominal, interest rates.

17. See Hankin [9]. This study was based on measures of ROC which are slightly different from those used in this study. Later he was kind enough to replicate his results using the ROC's reported in Table 3. The results for the after-tax ROC for 1947-75 are (t- statistics in parentheses):

$$ROC = 5.93 + T - .183 \Delta GNP - .195 \Delta P$$
$$(10.5) \quad (1.78) \quad (5.13) \quad (-3.76)$$

where T = a linear time trend from 1947 to 1975. T is standardized to have a mean of zero.

ΔGNP = the percentage change in real GNP .

ΔP = the percentage change in the consumer price index.

The equation was fitted using a Cochrane-Orcutt iterative technique to correct for a serious positive autocorrelation of residuals (ρ = .733).

18. We stop the comparison with 1972, the most recent year for which revised data for the alternative assumptions were available.

19. Current corporate accounting practice differs from historical cost accounting as we have calculated it from the NIPA. Many firms use LIFO inventory accounting, for example, and assume shorter depreciable lives than 85 percent of Bulletin F values.

20. Christensen and Jorgenson [3] have developed estimates of rates of return for the entire corporate sector (not just NFC's) after all taxes, including property taxes and personal income taxes on corporate income. These estimates, although they extend only through 1973, appear to show a pattern consistent with our results.

21. The specific items were cash, accounts receivable, land, intangibles, and other assets. Accounts payable and other non-interest bearing liabilities were subtracted. "Investments" were not added, since most items in this category are interest-bearing marketable securities, and operating income is measured before net interest paid. That is, the interest income earned on these assets is subtracted from interest paid on NFC debt. Since the interest income on investments is not included in the numerator of the ROC calculation, it is inappropriate to include the value of these investments in the denominator.

22. Averages for after-tax ROC for the three periods we have distinguished are (figures in percent):

	Table 3		Table 6
1946-60	6.3	1947-60	5.7
1961-70	8.0	1961-70	7.1
1971-75	5.6	1971-75	4.9

23. Let CS_t and INV_t be the net replacement cost of a firm's capital stock and inventory, respectively, at the end of period t. Then the total nominal income realized in period t includes operating income, net of depreciation calculated on CS_{t-1}, plus the holding gains realized on capital stock and inventories. Thus

$$\begin{array}{ccccc} \text{Total} & & & & \text{Nominal} \\ \text{Nominal} & = & \text{Operating} & + & \text{Holding} \\ \text{Income} & & \text{Income} & & \text{Gains} \end{array}$$

The holding gain on capital stock is

$$\begin{array}{cccccc} \text{Nominal} & & & & \text{Depreciation} & & \text{Capital} \\ \text{Holding} & = & CS_t & - & CS_{t-1} & - \text{ charged} & - \text{ acquired dur-} \\ \text{Gain} & & & & & \text{against } CS_{t-1} & \text{ing period t} \end{array}$$

The holding gain on inventory is computed in the same way.

These holding gains are nominal because they are partly or wholly due to inflation. CS_t and INV_t are computed in period t dollars, while CS_{t-1} and INV_{t-1} are computed in t-1 dollars. We could calculate <u>real</u> holding gains by re-expressing CS_{t-1} and INV_{t-1} in period t dollars. If i_t is the general inflation rate (the change in Consumer Price Index, for example) between periods t-1 and t, then the real holding gain on capital stock is

$$\begin{array}{cccccc} \text{Real} & & & & \text{Depreciation} & \text{Capital} \\ \text{Holding} & = & CS_t & - & (1+i_t)CS_{t-1} & - \text{ Charged} & - \text{ Acquired Dur-} \\ \text{Gain} & & & & & \text{against } CS_t & \text{ing Period t} \end{array}$$

For convenience we assume that operating income, depreciation and acquisitions of capital stock and income are all expressed in period t dollars.

If replacement costs increase <u>only</u> in response to general inflation -- i.e. at exactly the rate i_t -- then <u>real</u> holding gains are zero. This, in turn, means that real total income is just exactly equal to operating income.

(There is no need to distinguish between real and nominal operating income. Operating income is expressed in period t dollars, which are the units of measurement for both real and nominal total income.)

24. The holding gains have no evident relationship to q or to the real rates of return earned by investors.

25. [17], pp. 180-81.

26. [17], pp. 205-208.

27. The revisions increase ROC in only one year -- 1956. It is unaffected in 1955 and 1957. It is reduced in all other years between 1948 and 1962.

28. In this chart only we have plotted our standard ROC computed excluding net NFC residential capital from the standard base. This was done to allow a consistent comparison with Nordhaus's figures.

29. Hankin [9] worked with ROC data from an earlier version of this study. Our tests replicate his model exactly, except for slight changes in the ROC figures. We are grateful for his help.

30. Hankin found that the main impact of inflation on after-tax ROC occurred via the effective corporate tax rate. See fn. 17 above.

31. We believe Nordhaus is the only investigator who has attempted to measure and compare trends in the rate of return and the cost of capital. But his cost of capital measure is flawed by (1) the use of book, rather than market values, for debt and equity in his weighted average cost of capital measure; (2) an inappropriate adjustment for the tax shield provided by interest; (3) using a risk-free rate to measure the expected rate of return on corporate bonds; and (4) using the earnings-price ratio for the expected market rate of return on equity. (See [17], esp. p. 199.) Assumption (4), or some equally simple rule of thumb, is perhaps unavoidable when dealing with aggregate data. But the first three assumptions can be improved upon.

32. This approach to valuation was first presented by Miller and Modigliani [15].

33. This assumes a constant expected long-term rate of expansion in real capital stock. It is conceivable that q could vary due to changes in the expected rate of investment, even with ROC and ρ constant. But we consider this unlikely, for two reasons. First, if ROC and ρ are constant, there is no obvious mechanism to account for changes in the real investment rate. Second, Figures 6 and 7 below show that recent fluctuations in MV can be largely accounted for by changes in ROC.

34. We do not claim that this new approach is without its own difficulties. For example, there are problems in defining and measuring real capital, and in estimating market values. These problems are likely to be particularly severe in cross-sectional comparisons. There is little meaning in comparing the q's of the drug and steel industries, for example, since so much of the drug industry's assets do not show on balance sheets. (Comparisons of the industries' ROC's would be just as suspect -- perhaps more so.) At best one could make rough adjustments such as capitalizing and amortizing advertising and outlays on research and development. On the other hand, biases in estimating RC or MV are not likely to be volatile over time. Thus a change in q can be clearly interpreted even though the absolute value of the ratio cannot. See pp. 11-11d above.

35. Values of q and ROC presented in Figure 6 are calculated from the standard, rather than the augmented, estimates of capital stock.

36. The exception is 1975. However, we suspect that the stock market's strong performance in early 1976 has restored the relationship.

37. Remember that we have estimated in real terms. The current perception of high capital costs is based on nominal rates.

REFERENCES

1. "Alternative Estimates of Corporate Depreciation and Profits, 1965-73."
   Survey of Current Business, 54 (May 1974), 19-22.

2. Bodie, Z. "Hedging Against Inflation," unpublished Ph.D. dissertation,
   M.I.T., 1975.

3. Christensen, L. R., and D. W. Jorgenson. Measuring Economic Performance,
   1947-73. Report to the U.S. Department of Commerce and Department of
   Labor. May, 1975.

4. Ciccolo, J. "Four Essays on Monetary Policy," Unpublished Ph.D. disserta-
   tion, Yale University, 1975.

5. Coen, R. M. "Depreciation, Profits, and Rates of Return in Manufacturing
   Industries," unpublished paper prepared for the Office of Tax Analysis,
   U.S. Treasury Department. April 1975.

6. Economic Report of the President. (Washington: U.S. Government Printing
   Office, January 1977).

7. Fama, E. F. "Efficient Capital Markets: A Review of Theory and Empirical
   Work," Journal of Finance, 25 (May 1970), 383-417.

8. Goldsmith, R. W. "The Position of Institutional Investors and of
   Corporate Stock in the National Balance Sheets and the Flow of Funds
   Accounts of the United States of America, 1952-68." In R. W. Goldsmith,
   ed., Institutional Investors and Corporate Stock, (New York: National
   Bureau of Economic Research, 1973).

9. Hankin, R. The Impact of Inflation on Corporate Profitability, unpublished
   S.B. Thesis, M.I.T., 1977.

9a. Harberger, A. C., and M. J. Bailey. The Taxation of Income From Capital.
    (Washington: Brookings Institution, 1969).

9b. Holland, D. M. Dividends Under the Corporate Income Tax. (Princeton,
    N. J.: Princeton University Press, 1962).

10. Ibbotsen, R., and R. Sinquefield. "Stocks, Bonds, Bills and Inflation:
    Year-by-Year Historical Returns (1926-74). Journal of Business 49
    (January 1976), 11-47.

11. Jensen, M.C. "Risk, the Pricing of Capital Assets and the Evaluation
    of Investment Portfolios," Journal of Business, 42 (April 1969), 167-274.

12. Lintner, J. "Inflation and Common Stock Prices in a Cyclical Context,"
    Annual Report of the National Bureau of Economic Research, (1973).

13. Lorie, J. H., and R. A. Brealey. Modern Developments in Investment
    Management, (New York: Praeger Publishers, 1972).

14. Lorie, J. H., and M. T. Hamilton. The Stock Market: Theories and
    Evidence, (Homewood, Illinois: Richard D. Irwin, Inc., 1973).

15. Miller, M. H., and F. Modigliani. "Dividend Policy, Growth, and the Valuation of Shares," Journal of Business, 34 (October 1961), 411-33.

16. Musgrave, J. C. "New Estimates of Fixed Nonresidential Business Capital in the United States, 1925-73," Survey of Current Business, 54 (March 1974), 23-27.

17. Nordhaus, D. "The Falling Share of Profits," Brookings Papers on Economic Activity, Vol. 5, No. 1 (1974), 1969-308.

17a. Pechman, J. A. Federal Tax Policy. Rev. Ed. (Washington: Brookings Institution, 1971).

18. "Profits -- an Incredible Half-Century of Stability." Monthly Economic Letter, First National City Bank, February, 1974, 11-15.

19. Terborgh, G. "Inflation and Profits," Financial Analysts Journal, 30 (May-June, 1974), 19-23.

20. Tobin, J. "A General Equilibrium Approach to Monetary Theory," Journal of Money, Credit and Banking, 1 (February 1969), 15-29.

21. _____. "Inflation, Interest Rates and Stock Values," Morgan Guarantee Survey, July, 1974, 4-7.

22. _____ and Brainard, W. C. "Pitfalls in Financial Model Building," American Economic Review, 58 (May 1968), 99-122.

Note: See Appendix for discussion of data sources and computational Procedures.

Appendix

In this appendix we tabulate the estimates prepared for our study. Notes that explain the derivation of the estimates follow each table.

List of Tables

Title

Table A1

MARKET VALUES OF DEBT AND EQUITY OF

NON-FINANCIAL CORPORATIONS, 1929-75

Figures in Billions

Year	Market Value of Debt	Market Value of Equity	Total
1929	23.1	154.3	177.4
1930	26.7	124.4	151.1
1931	22.3	65.7	88.0
1932	16.0	24.8	40.8
1933	28.2	47.7	75.9
1934	31.8	66.5	98.3
1935	35.2	61.6	96.8
1936	38.8	123.9	162.7
1937	38.5	105.9	144.4
1938	32.6	46.1	78.7
1939	35.6	77.2	112.8
1940	32.0	64.5	96.5
1941	35.4	58.7	94.1
1942	37.3	47.4	84.6
1943	32.5	84.6	117.1
1944	32.4	85.4	117.7
1945	33.7	99.3	133.0
1946 I	21.4	129.5	150.8
II	24.7	145.3	170.0
III	24.5	138.4	162.9
IV	24.1	128.7	152.7
1947 I	25.6	124.7	150.3
II	22.2	119.4	141.6
III	25.2	124.5	149.7
IV	23.8	115.1	138.9
1948 I	25.6	112.4	138.0
II	25.9	117.4	143.4
III	23.7	128.4	152.2
IV	22.9	115.8	138.7
1949 I	26.1	102.5	128.5
II	29.0	95.3	124.3
III	28.9	96.3	125.2
IV	29.8	100.9	130.7
1950 I	27.8	112.1	139.9
II	27.9	120.8	148.6
III	27.1	124.1	151.2
IV	28.0	125.2	153.1

Year	Market Value of Debt	Market Value of Equity	Total
1951 I	31.6	119.2	150.8
II	29.9	124.4	154.3
III	31.2	128.6	159.7
IV	31.1	130.4	161.6
1952 I	33.4	123.3	156.7
II	34.3	133.2	167.5
III	34.3	137.3	171.6
IV	36.7	140.9	177.6
1953 I	34.2	138.7	172.9
II	32.9	142.1	175.0
III	33.7	137.4	171.0
IV	36.7	135.4	172.0
1954 I	38.8	152.1	190.8
II	43.1	153.5	196.6
III	45.9	176.0	221.8
IV	52.2	185.7	237.9
1955 I	46.1	205.1	251.2
II	45.7	217.4	263.1
III	44.9	254.6	299.6
IV	44.4	239.5	284.0
1956 I	44.6	238.6	283.1
II	45.7	247.5	293.2
III	45.8	252.5	298.3
IV	44.6	247.0	291.6
1957 I	44.8	234.2	297.1
II	46.4	250.6	297.0
III	45.6	256.0	301.6
IV	47.6	225.1	272.7
1958 I	53.0	232.0	285.0
II	56.4	247.6	304.0
III	59.7	267.0	324.9
IV	59.4	288.6	348.1
1959 I	59.6	321.1	380.7
II	62.6	334.4	397.0
III	62.5	343.9	406.4
IV	62.6	340.6	403.2
1960 I	62.2	331.4	393.5
II	64.8	329.5	394.2
III	68.7	338.1	406.8
IV	72.6	327.6	400.2

Table A1 (continued)

Year	Market Value of Debt	Market Value of Equity	Total
1961 I	73.1	361.9	435.0
II	75.7	393.2	468.9
III	78.3	397.9	476.2
IV	82.2	423.1	505.3
1962 I	85.0	415.5	500.5
II	87.8	378.7	466.5
III	91.1	359.1	450.2
IV	96.8	364.4	461.2
1963 I	92.0	413.4	505.4
II	96.9	444.4	541.4
III	101.2	453.7	554.9
IV	103.3	466.2	569.6
1964 I	107.7	481.9	589.6
II	107.2	503.3	610.5
III	110.0	516.7	626.6
IV	112.3	531.8	644.0
1965 I	116.9	535.1	652.0
II	124.5	563.8	688.2
III	124.7	579.0	703.7
IV	130.8	620.8	751.6
1966 I	129.6	600.0	729.6
II	129.3	556.6	685.9
III	129.5	507.0	636.5
IV	131.9	479.6	611.5
1967 I	141.2	548.7	689.8
II	142.1	601.3	743.4
III	140.6	620.6	761.2
IV	138.4	591.6	730.0
1968 I	137.6	621.5	759.2
II	138.2	666.7	804.9
III	148.7	720.1	868.8
IV	155.1	723.6	878.6
1969 I	158.8	662.4	821.1
II	166.0	671.0	837.0
III	171.7	614.9	786.7
IV	172.0	610.6	782.7
1970 I	176.9	554.0	731.0
II	186.0	497.5	683.5
III	187.0	488.8	675.9
IV	195.0	515.6	710.7

Year	Market Value of Debt	Market Value of Equity	Total
1971 I	208.7	640.6	849.3
II	205.6	644.7	850.3
III	203.5	661.3	864.8
IV	217.6	605.0	822.6
1972 I	219.9	735.4	955.3
II	223.8	751.8	975.6
III	235.0	767.6	1002.6
IV	257.8	800.0	1057.8
1973 I	273.5	823.1	1096.6
II	289.3	779.3	1068.5
III	298.7	787.8	1086.5
IV	325.8	738.9	1064.7
1974 I	338.0	727.0	1065.0
II	340.3	838.4	1178.7
III	332.3	674.8	1007.1
IV	324.1	531.2	855.3
1975 I	317.7	627.7	945.4
II	323.1	698.8	1021.9
III	332.4	683.1	1015.5
IV	332.4	690.8	1023.2

Sources

1. Market Value of Debt. Net interest paid by non-financial corporations
   was capitalized at Moody's Baa corporate bond rate. After 1945, net
   interest was available by quarter from Survey of Current Business.
   Only annual figures were available for 1929 to 45. Worksheets were
   provided by BEA.

   Yields were taken from Moody's Industrial Manual. Yields used to capi-
   talize quarterly net interest are simple averages of yields quoted for
   each month in the quarter. For 1929-45, the yield quoted for June was used.

2. Market Value of Equity. Net dividend payments by non-financial corporations
   were capitalized at the dividend yield of the Standard and Poor's
   Composite Index.

   Annual dividend payments are available from 1929-45 from BEA worksheets.
   Quarterly payments are available from the Survey of Current Business for 1946-75.

   The dividend yield used was an arithmetic average of monthly indexes reported
   for April, May and June, taken from Standard and Poor's Trade Statistics.

<u>Table A2a</u>

NET CAPITAL STOCK AND INVENTORIES OF

NON-FINANCIAL CORPORATIONS, 1929-75

<u>Standard Base, Straight-Line Depreciation,</u>

<u>Service Lives 85 percent of Bulletin F</u>

Figures in Billions, Current Dollars

Year	1. Net Residential Capital	2. Net Non-Residential Capital	3. Average Capital Stock	4. Inventory	5. Standard Base
1928	3.0	64.5			
1929	3.1	64.9	67.8	24.0	91.8
1930	3.0	61.8	66.4	23.0	89.4
1931	2.5	55.3	61.3	19.8	81.1
1932	2.2	49.6	54.8	16.6	71.4
1933	2.3	48.2	51.2	15.7	66.9
1934	2.3	47.9	50.4	16.8	67.1
1935	2.3	47.2	49.9	17.5	67.3
1936	2.5	49.4	50.7	18.9	69.6
1937	2.7	51.9	53.3	20.7	74.0
1938	2.7	50.5	53.9	20.5	74.4
1939	2.7	50.3	53.1	20.4	73.5
1940	2.9	53.4	54.7	22.0	76.7
1941	3.1	59.8	59.6	25.9	85.5
1942	3.3	63.8	65.0	30.1	95.1
1943	3.4	64.2	67.4	31.3	98.7
1944	3.6	64.7	68.0	31.2	99.2
1945	3.8	70.5	71.3	30.6	101.9
1946	4.3	85.4	82.0	36.4	118.4
1947	4.8	106.0	100.3	46.3	146.6
1948	5.0	120.6	118.2	52.6	170.8
1949	5.2	125.0	127.9	52.5	180.4
1950	5.5	141.7	138.7	55.6	194.3
1951	5.7	152.3	152.6	65.5	218.1
1952	5.8	167.3	165.6	71.5	237.1
1953	5.8	177.0	178.0	73.0	251.0
1954	5.9	185.4	187.1	73.0	260.1
1955	6.1	202.8	200.1	75.7	275.8
1956	6.3	226.2	220.7	83.4	304.1
1957	6.6	243.8	241.5	88.3	329.8
1958	7.2	251.2	254.4	86.9	341.3
1959	7.8	258.8	262.5	90.5	353.0
1960	8.5	265.9	270.5	95.6	366.1

Year	1. Net Residential Capital	2. Net Non-Residential Capital	3. Average Capital Stock	4. Inventory	5. Standard Base
1961	9.4	271.2	277.5	95.2	372.7
1962	10.7	279.8	285.6	100.9	386.5
1963	12.2	289.1	295.9	106.3	402.2
1964	13.8	303.8	309.5	112.3	421.8
1965	15.3	328.9	330.8	121.7	452.5
1966	16.6	363.2	362.0	134.8	496.8
1967	18.5	397.1	397.7	148.6	546.8
1968	22.0	438.0	437.8	165.1	602.9
1969	25.4	489.2	487.3	175.8	663.1
1970	27.7	537.3	539.8	189.2	729.0
1971	30.2	580.1	587.7	199.1	786.8
1972	34.6	629.4	637.2	209.6	846.8
1973	41.3	721.8	713.6	236.4	950.0
1974	46.7	854.9	832.4	300.7	1133.1
1975	50.1	955.5	953.6	322.0	1275.6

Sources

Sources for each of the five columns are as follows.

1. Net residential capital of non-financial corporations, end of year, from Capital in the United States, p. 308.

2. Net fixed non-residential capital of non-financial corporations, end of year, from Capital in the United States, p. 115.

3. "Average" means the average of beginning and end of year values -- i.e. the average net residential capital for 1950 would be the average of figures given for 1949 and 1950 in column 1. Column three is obtained by summing columns 1 and 2 and taking an average for each year.

4. Figures for 1929-58 are averages of beginning and end of year values. Second quarter inventories are reported after 1958. Source: NIPA worksheets furnished by the Department of Commerce.

5. Sum of columns 3 and 4.

NET CAPITAL STOCK AND INVENTORIES OF

NON-FINANCIAL CORPORATIONS, 1946-72

Standard Base, Double Declining Balance Depreciation,

Service Lives 85 percent of Bulletin F

Figures in Billions, Current Dollars

Year	1. Net Residential Capital	2. Net Non-Residential Capital	3. Average Capital Stock	4. Inventory	5. Standard Base
1945	3.8	56.3			
1946	4.3	68.7	66.6	36.4	103.0
1947	4.8	86.1	82.0	46.3	128.3
1948	5.0	98.4	97.2	52.6	149.8
1949	5.2	104.3	106.5	52.5	159.0
1950	5.5	115.4	115.2	55.6	170.8
1951	5.7	128.2	127.4	65.5	192.9
1952	5.8	136.3	138.0	71.5	209.5
1953	5.8	144.4	146.2	73.0	219.2
1954	5.9	151.1	153.6	73.0	226.6
1955	6.1	165.3	164.2	75.7	239.9
1956	6.3	184.7	181.2	83.4	264.6
1957	6.6	199.1	198.4	88.3	286.7
1958	7.2	204.1	208.5	86.9	295.4
1959	7.8	209.7	214.4	90.5	304.9
1960	8.5	215.3	220.7	95.6	316.3
1961	9.4	219.4	226.3	95.2	321.5
1962	10.7	226.5	233.0	100.9	333.9
1963	12.2	234.2	241.8	106.3	348.1
1964	13.8	246.6	253.4	112.3	365.7
1965	15.3	268.3	272.0	121.7	393.7
1966	15.6	297.5	298.9	134.8	433.7
1967	18.5	325.2	328.9	148.6	477.5
1968	22.0	358.5	362.1	161.5	523.6
1969	25.4	400.1	403.0	175.8	578.8
1970	27.7	438.2	445.7	189.2	634.9
1971	30.2	471.7	483.9	199.1	683.0
1972	34.6	511.4	524.0	209.6	733.6

Notes

Definitions and computational procedures are identical to Table A2a, except for the shift to double-declining balance depreciation for net non-residential capital. Column 2 is from Capital in the United States, p. 308.

Table A2c

NET CAPITAL STOCK AND INVENTORIES OF

NON-FINANCIAL CORPORATIONS, 1946-72

Standard Base, Straight-Line Depreciation Service Lives

Shifting from Bulletin F to 75 percent of Bulletin F over Time

Figures in Billions, Current Dollars

Year	1. Net Residential Capital	2. Net Non-Residential Capital	3. Average Capital Stock	4. Inventory	5. Standard Base
1945	3.8	84.0			
1946	4.3	100.8	96.5	36.4	132.9
1947	4.8	123.1	116.7	46.3	163.0
1948	5.0	138.0	136.1	52.6	188.7
1949	5.2	146.5	147.8	52.5	200.3
1950	5.5	161.3	159.3	55.6	214.9
1951	5.7	177.9	175.2	65.5	240.7
1952	5.8	188.7	188.8	71.5	260.3
1953	5.8	197.8	198.8	73.0	271.8
1954	5.9	205.9	207.7	73.0	280.7
1955	6.1	223.7	220.8	75.7	296.5
1956	6.3	247.4	241.8	83.4	325.2
1957	6.6	264.3	262.3	88.3	350.6
1958	7.2	270.4	274.3	86.9	361.2
1959	7.8	276.5	281.0	90.5	371.5
1960	8.5	281.6	287.2	95.6	382.8
1961	9.4	284.6	292.1	95.2	387.3
1962	10.7	290.7	297.7	100.9	398.6
1963	12.2	297.4	305.5	106.3	411.8
1964	13.8	309.5	316.5	112.3	428.8
1965	15.3	337.8	335.2	121.7	456.9
1966	16.6	362.8	363.3	134.8	498.1
1967	18.5	393.1	395.5	148.6	544.1
1968	22.0	430.3	432.0	161.5	593.5
1969	25.4	477.1	477.4	175.8	653.2
1970	27.7	520.4	525.3	189.2	714.5
1971	30.2	558.0	568.2	199.1	767.3
1972	34.6	602.1	612.5	209.6	822.1

Notes

Definitions and computational procedures are the same as in Table A2a, except for
the different assumptions about service lives. Column 2 is from Capital in the
United States, p. 247. Estimates in this column are based on the following
assumption as to services lives: 100 percent of Bulletin F up to 1940, a gradual
decline to 75 percent from 1940 to 1960, and continuing at 75 percent from 1960
on.

Table A2d

NET CAPITAL STOCK AND INVENTORIES OF

NON-FINANCIAL CORPORATIONS, 1946-72

Standard Base, Straight Line Depreciation Based on

Historical Cost, Service Lives 85 percent of Bulletin F

Figures in Billions, Current Dollars

Year	1. Net Residential Capital	2. Net Non-Residential Capital	3. Average Capital Stock	4. Inventory	5. Standard Base
1945	2.2	51.7			
1946	2.2	58.8	57.4	36.4	93.8
1947	2.3	70.5	66.9	46.3	113.2
1948	2.4	82.1	78.6	52.6	131.2
1949	2.5	90.5	88.7	52.5	141.2
1950	2.7	99.4	97.5	55.6	153.1
1951	2.8	110.8	107.8	65.5	173.3
1952	2.9	121.5	119.0	71.5	190.5
1953	3.0	133.6	130.5	73.0	203.5
1954	3.1	143.6	141.7	73.0	214.7
1955	3.3	155.4	152.8	75.7	228.5
1956	3.6	170.6	166.4	83.4	249.8
1957	3.9	186.6	182.3	88.3	270.6
1958	4.3	196.5	195.6	88.1	283.7
1959	4.9	207.5	206.6	90.5	297.1
1960	5.6	219.7	218.8	95.6	314.4
1961	6.6	230.0	231.0	95.2	326.2
1962	7.8	242.5	243.5	100.9	344.4
1963	9.3	254.4	257.1	106.3	363.4
1964	10.9	269.6	272.2	112.3	384.5
1965	12.4	291.7	292.3	121.7	414.0
1966	13.7	318.8	318.3	134.8	453.1
1967	14.8	343.9	345.6	148.6	494.2
1968	16.4	370.9	373.0	161.5	534.5
1969	18.4	402.0	403.8	175.8	579.6
1970	20.2	430.2	435.4	189.2	624.6
1971	22.3	458.9	465.8	199.1	664.9
1972	25.1	492.2	499.2	209.6	708.8

Notes

Definitions and computational procedures are the same as in Table A2a, except that asset values are based on historical cost -- that is, original cost. Columns 1 and 2 are from Capital Stock in the United States, pp. 331 and 169 respectively.

Table A3

ESTIMATED TOTAL NON-FINANCIAL ASSETS

OF NON-FINANCIAL CORPORATIONS, 1947-75

Figures in Billions, Current Dollars

Year	1. Standard Base	2. Cash	3. Accounts Receivable	4. Other Net Current Assets	5. Land and Intangibles	6. Addition to Standard Base	7. Augmented Base
1947	146.6	23.4	31.0	-43.5	12.1	22.3	168.9
1948	170.8	23.2	35.3	-46.7	12.8	23.8	194.6
1949	180.4	23.4	33.5	-41.9	10.5	25.1	205.5
1950	194.3	25.5	45.5	-59.2	14.3	25.8	220.1
1951	218.1	26.7	48.2	-65	12.9	24.4	242.5
1952	237.1	29.2	58	-90	14.7	17.3	254.4
1953	251.0	27.5	52	-66	13.5	19.5	270.5
1954	260.1	29.3	55.1	-69	14.4	28.4	288.5
1955	275.8	30.2	65	-80	16	30.5	306.3
1956	304.1	30.0	70.5	-86	17	31.4	335.5
1957	329.8	30.1	73.0	-82	17.7	34.2	364.0
1958	342.5	32.1	79.7	-87	19	41.2	383.7
1959	353.0	31.1	85	-100	21.5	40.7	393.7
1960	366.1	32.0	87	-104	24	38.3	404.4
1961	372.7	34.0	96	-112	25	41.0	413.7
1962	386.5	35.0	101	-121	26.5	42.3	428.7
1963	402.2	36.3	109	-133	29.8	41.8	444.0
1964	421.8	37.7	125	-144	31	55.9	477.7
1965	452.5	39.7	150.9	-161	36	50.6	503.1
1966	496.8	41.0	154	-176	39	61.8	558.6
1967	546.3	44.8	166	-189	50	64.9	611.2
1968	597.8	47.5	186	-220	75	80.2	678.0
1969	661.6	48.1	219	-256	69	82.3	743.9
1970	729.0	50.6	227	-273	78	81.4	810.4
1971	786.8	54.8	240	-292	80	82.7	869.5
1972	846.8					88.9	935.7
1973	950.0					98.4	1048.4
1974	1133.1					114.9	1248.0
1975	1275.6					127.4	1403.0

Sources

Sources for each of the seven columns are as follows.

1. The standard base is taken from Table A2a.

2. Estimates of non-financial corporations' non-financial assets, other than capital stock and inventory, are taken from Statistics of Income, Corporation Income Tax Returns, 1947-71. Figures after 1971 were estimated as follows. Average ratios of cash, accounts receivable, and other net current assets to the standard base were computed for 1966-71. These ratios were multiplied by the standard base to obtain estimates for 1972, 1973, 1974 and 1975.

Definitions for cash and accounts receivable are those used in
Statistics of Income. "Other net current assets" is defined as:
"Assets not allocated to a specific current account in the return form
balance sheet, and assets specifically reported as short-term by the
corporation, as well as marketable securities other than Government
obligations . . ." (Statistics of Income, 1968, Corporation Income
Tax Returns, p. 166.)

Other net current assets do not include investments. The object was
to include all other non-interest bearing current assets, net of all
other non-interest bearing current liabilities.

Statistics of Income does not give figures for non-financial corpora-
tions directly. The figures for financial corporations were subtracted
from the total for all corporations.

3. Column 5 was obtained by summing columns 2, 3 and 4 and averaging
    beginning and end of year values. Column 6 is the sum of columns 1
    and 5.

Note: Columns 1, 5 and 6 are averages of beginning and end of year values.
       Columns 2, 3 and 4 are end of year values.

PROFITS OF NON-FINANCIAL CORPORATIONS, 1929-75

Straight-line Depreciation,

Service Lives 85 Percént of Bulletin F

Figures in Billions, Current Dollars

Year	1. Reported Profits Before Tax	2. Net Interest	3. Operating Profits Before Tax = (1) + (2)	4. Taxes	5. Operating After Tax = (3) - (4)
1929	8.4	1.4	9.8	1.2	8.7
1930	3.1	1.6	4.7	.7	4.0
1931	-.5	1.8	1.3	.5	.8
1932	-2.5	1.7	-.8	.3	-1.1
1933	.6	1.7	2.3	.5	1.8
1934	2.0	1.6	3.6	.7	2.9
1935	3.0	1.6	4.6	.9	3.8
1936	5.5	1.6	7.1	1.3	5.7
1937	5.9	1.6	7.5	1.4	6.0
1938	2.9	1.5	4.4	.9	3.5
1939	6.1	1.5	7.6	1.4	6.2
1940	8.8	1.4	10.2	2.7	7.5
1941	16.4	1.3	17.7	7.5	10.3
1942	20.1	1.3	21.4	11.2	10.2
1943	23.6	1.1	24.7	18.8	10.9
1944	22.2	1.0	23.2	12.6	10.6
1945	17.8	1.0	18.8	10.2	8.6
1946	14.1	0.7	14.8	8.6	6.2
1947	19.9	0.8	20.7	10.8	9.9
1948	25.8	0.9	26.7	11.8	14.9
1949	23.0	1.0	24.0	9.3	14.7
1950	29.6	0.9	30.5	16.9	13.6
1951	33.4	1.1	34.5	21.2	13.3
1952	30.3	1.2	31.5	17.8	13.7
1953	29.9	1.3	31.2	18.5	12.7
1954	28.6	1.6	30.2	15.6	14.6
1955	38.2	1.6	39.8	20.2	19.6
1956	36.1	1.7	37.8	20.1	17.7
1957	35.0	2.2	37.2	19.1	18.1
1958	30.1	2.7	32.8	16.2	16.6
1959	39.7	3.1	42.8	20.7	22.1
1960	37.4	3.5	40.9	19.2	21.7

Table A4a (continued)

Year	1. Reported Profits Before Tax	2. Net Interest	3. Operating Profits Before Tax = (1) + (2)	4. Taxes	5. Operating After Tax = (3) − (4)
1961	37.4	3.9	41.3	19.5	21.8
1962	44.9	4.5	49.4	20.6	28.8
1963	50.0	4.8	54.8	22.8	32.0
1964	56.7	5.3	62.0	24.0	38.0
1965	66.1	6.1	72.2	27.2	45.0
1966	71.2	7.4	78.6	29.5	49.1
1967	67.2	8.7	75.9	27.7	48.2
1968	72.1	10.1	82.2	33.6	48.6
1969	66.4	13.1	79.5	33.3	46.2
1970	51.6	17.0	68.6	27.3	41.3
1971	58.7	17.9	76.6	29.9	46.7
1972	72.0	19.1	91.1	33.5	57.6
1973	76.0	23.1	99.1	39.6	59.5
1974	59.6	29.0	88.6	42.6	46.0
1975	72.5	30.8	103.5	39.7	63.6

Sources

Columns 1, 2 and 4 are from Survey of Current Business, various issues. Data for 1929-45 were taken from worksheets supplied by BEA. Column 3 is the sum of columns 1 and 2. Column 4 is column 3 less 4 -- although 5 and 4 do not, in all cases, add exactly to 3. This is due to rounding in the underlying data.

Table A4b

PROFITS OF NON-FINANCIAL CORPORATIONS, 1946-72

Double Declining Balance Depreciation,
Service Lives 85 Percent of Bulletin F

Figures in Billions, Current Dollars

Year	1. Reported Profits Before Tax	2. Net Interest	3. Operating Profits Before Tax = (1) + (2)	4. Taxes	5. Operating After Tax = (3) - (4)
1946	13.9	0.7	14.6	8.6	6.0
1947	19.3	0.8	20.1	10.8	9.3
1948	24.9	0.9	25.8	11.8	14.0
1949	22.0	1.0	23.0	9.3	13.7
1950	28.6	0.9	29.5	16.9	12.6
1951	32.4	1.1	33.5	21.2	12.3
1952	29.3	1.2	30.5	17.8	12.7
1953	28.7	1.3	30.0	18.5	11.5
1954	27.4	1.6	29.0	15.6	13.4
1955	37.1	1.6	38.7	20.2	18.5
1956	34.6	1.7	36.3	20.1	16.2
1957	33.2	2.2	35.4	19.1	16.3
1958	28.4	2.7	31.1	16.2	14.9
1959	38.2	3.1	41.3	20.7	20.6
1960	36.1	3.5	39.6	19.2	20.4
1961	36.2	3.9	40.1	19.5	20.6
1962	43.6	4.5	48.1	20.6	27.5
1963	48.7	4.8	53.5	22.8	30.7
1964	55.1	5.3	60.4	24.0	36.4
1965	64.0	6.1	70.1	27.2	42.9
1966	68.3	7.4	75.7	29.5	46.2
1967	63.6	8.7	72.3	27.7	44.6
1968	68.1	10.1	78.2	33.6	44.6
1969	61.9	13.1	75.0	33.3	41.7
1970	46.9	17.0	63.9	27.3	36.6
1971	54.2	17.9	72.1	29.9	42.2
1972	67.5	19.1	86.6	33.5	53.1

Notes

See notes for Table A4a for columns 2 and 4. Column 1 from Survey of Current Business, March, 1976, p. 56, line 16.

This is the formula used to estimate the percentage returns given in column 4.

5. <u>Dollar Holding Gain</u>. The product of column 4 and the "Standard Base." The Standard Base is taken from Table A2a.

Table A4d

PROFITS OF NON-FINANCIAL CORPORATIONS, 1946-72

Historical Cost Depreciation,

Service Lives 85 Percent of Bulletin F

Figures in Billions, Current Dollars

Year	1. Reported Profits Before Tax	2. Net Interest	3. Operating Profits Before Tax - (1) + (2)	4. Taxes	5. Operating After Tax = (3) - (4)
1946	21.4	0.7	22.1	8.6	13.5
1947	28.7	0.8	29.5	10.8	18.7
1948	31.5	0.9	32.4	11.8	20.6
1949	24.6	1.0	25.6	9.3	16.3
1950	38.2	0.9	39.1	16.9	22.2
1951	39.1	1.1	40.2	21.2	19.0
1952	33.8	1.2	35.0	17.8	17.2
1953	35.4	1.3	36.7	18.5	18.2
1954	33.2	1.6	34.8	15.6	19.2
1955	44.3	1.6	45.9	20.2	25.7
1956	44.2	1.7	45.9	20.1	25.8
1957	42.5	2.2	44.7	19.1	25.6
1958	36.4	2.7	39.1	16.2	22.9
1959	46.1	3.1	49.2	20.7	28.5
1960	43.4	3.5	46.9	19.2	27.7
1961	42.4	3.9	46.3	19.5	26.8
1962	49.4	4.5	53.9	20.6	33.3
1963	54.4	4.8	59.2	22.8	36.4
1964	61.1	5.3	66.4	24.0	42.4
1965	71.9	6.1	78.0	27.2	50.8
1966	77.5	7.4	84.9	29.5	55.4
1967	74.0	8.7	82.7	27.7	55.0
1968	81.6	10.1	91.7	33.6	58.1
1969	79.6	1.31	92.7	33.3	59.4
1970	66.4	17.0	83.4	27.3	56.1
1971	75.2	17.9	93.1	29.9	63.2
1972	91.1	19.1	110.2	33.5	76.7

Notes

Column 1, line 5, of Table 3 in Survey of Current Business, March, 1976, p. 56
minus line 33 of Table 1.15, Survey of Current Business, January 1976
(Part II), pp. 24-25.

Table A5

ESTIMATED REAL HOLDING GAINS ON CAPITAL

STOCK OF NON-FINANCIAL CORPORATIONS, 1930-75

Year	Year-End Stock in Current Dollars	Year-End Stock in Constant Dollars	Year-End Consumer Price Index	Percent Holding Gain	Dollar Holding Gain
1929	68.0	255.9	.958		
1930	64.8	258.0	.900	.6	.4
1931	57.8	252.3	.814	.9	.5
1932	51.8	240.8	.731	4.6	2.5
1933	50.5	229.8	.734	1.7	.9
1934	50.2	220.7	.749	-1.9	-.9
1935	49.6	213.6	.772	-1.0	-.5
1936	51.9	210.8	.781	4.8	2.4
1937	54.6	211.6	.805	1.7	.9
1938	53.2	207.1	.783	2.4	1.3
1939	53.0	204.3	.779	1.5	.8
1940	56.3	205.1	.787	4.7	2.6
1941	62.9	208.6	.863	.2	.1
1942	67.1	204.4	.943	-.4	-.2
1943	67.6	197.6	.973	1.0	.7
1944	68.3	194.1	.993	.8	.5
1945	74.3	197.9	1.016	4.3	3.1
1946	89.7	212.6	1.200	-4.9	-4.0
1947	110.8	233.6	1.308	3.1	3.2
1948	125.6	250.3	1.343	2.8	3.3
1949	130.2	260.3	1.319	1.7	2.2
1950	147.2	270.1	1.395	3.0	4.2
1951	158.0	282.3	1.477	-3.0	-4.6
1952	173.1	292.8	1.490	4.7	7.8
1953	182.8	305.2	1.499	.7	1.3
1954	191.3	314.9	1.492	1.9	3.6
1955	208.9	327.3	1.498	4.6	9.3
1956	232.5	342.6	1.541	3.4	7.4
1957	250.4	357.2	1.587	.3	.7
1958	258.4	363.7	1.615	-.4	-1.0
1959	266.6	371.5	1.639	-.5	-1.2
1960	274.4	382.1	1.663	-1.4	-3.7
1961	280.6	391.4	1.675	-.9	-2.5
1962	290.5	404.4	1.695	-1.0	-2.8
1963	301.3	417.6	1.723	-1.2	-3.5
1964	317.6	435.3	1.745	-.2	-.5
1965	344.2	461.6	1.778	.3	1.0

Table A6

ESTIMATED REAL HOLDING GAINS ON INVENTORY

OF NON-FINANCIAL CORPORATIONS, 1946-75

Year	Inventory Valuation Adjustment	Mid-Year Inventory	Percent Change in Consumer Price-Index	Real Holding Gain
1946	5.3	70.6	18.1	-1.5
1947	5.9	77.1	9.0	-1.0
1948	2.2	79.3	2.7	.1
1949	-1.9	79.2	-1.8	-.5
1950	5.0	81.3	5.8	.3
1951	1.2	90.6	5.9	-4.1
1952	-1.0	98.0	.9	-1.9
1953	1.0	100.2	.6	.4
1954	.3	99.4	-.5	3.5
1955	1.7	101.3	.4	1.3
1956	2.7	107.7	2.9	-.4
1957	1.5	111.1	3.0	-1.8
1958	.3	110.1	1.8	-1.6
1959	.5	112.2	1.5	-1.2
1960	-.3	118.6	1.5	-2.0
1961	-.1	118.9	.7	-1.0
1962	-.1	126.1	1.2	-1.6
1963	.2	132.6	1.7	-2.0
1964	.5	139.7	1.3	-1.3
1965	1.9	148.8	1.9	-.9
1966	2.1	160.6	3.4	-3.3
1967	1.7	175.4	3.1	-3.6
1968	3.4	185.9	4.8	-5.4
1969	5.5	195.6	6.1	-6.4
1970	5.1	201.8	5.5	-5.9
1971	5.0	206.3	3.4	-2.0
1972	6.6	210.0	3.4	-.5
1973	18.4	219.4	3.8	-.9
1974	36.5	231.5	11.6	11.8
1975	11.5	226.6	7.0	4.4

Sources

1. Inventory Valuation Adjustment (IVA).

2. Mid-Year Inventory. See Table A2a.

3. Change in Consumer Price Index. Taken from Ibbotsen and Sinquefield [   ],
    Table   , p.

4. Real Holding Gain. Computed as IVA (column 1) less the product of Mid-year
    Inventory (column 2) and the change in the consumer price index (column 3).