C/81-5B

TRENDS ON RATES OF RETURN ON CAPITAL BY INDUSTRIES IN JAPAN

Takaaki Wakasugi — Tohoku University

Fumiko Konya — Japan Securities Research Institute

and

Kazuhiko Nishina — Yokohama City University

To be Presented at the Rate of

Return Conference, June 9-12, 1981,

Lincoln Institute of Land Policy

TRENDS ON RATES OF RETURN

ON CAPITAL BY INDUSTRIES IN JAPAN

I. INTRODUCTION

Almost all people accept the proposition that Japan has achieved extraordinarily high economic growth due to continuous investment in equipment after the World War II. Of course, such investment would never have continued without the cooperation of many other relevant factors. Some of the important and essential factors have been clarified before, such as entrepreneurs' ambitions for the firm's growth, successive technical renovations that stimulate entrepreneurship, and people's attitudes toward both moderate consumption and positive savings. In addition to these, we can also enumerate serious competition between firms, and often between groups of firms in every field of the economy. Also, we cannot neglect the unique financial system of Japan. Among others, the most important and critical factor is returns on capital investment. Even if all other factors were satisfied, investments in equipment would have never been undertaken without the strong anticipation for future profits.

Past fulfilled profits stimulate entrepreneurs and expectations of high profitability motivates investment in capital equipment. Investment necessiates raising new capital funds and requires certain returns in exchange for its commitment. Here, profits for capital, or returns on capital earned from investment becomes the relevant variable. The purpose of this paper is to measure the past performance of capital activities through the concept of "real" rates of return on capital, and to clarify any relationships between the profitability on capital and other important economic concepts.

Since the concept of return on capital seems to have a close relation with certain accounting concepts, it should be easy to calculate

returns on capital by use of accounting data. In fact, such accounting data is readily available. But, return on capital in the accounting sense, has several conceptual and practical difficulties from the point of view of economics. For example, since the principal purpose of accounting is to determine the net profit of stockholders, accounting profits assigned to equity capital are different from those assigned to total (both debt and equity) capital; certain parts of returns on capital are hidden by accounting conventions, especially by those of tax accounting. But these are not truly serious problems, for we can easily transform accounting returns on capital into economic returns. The most troublesome problem is that present accounting systems based on historical costs can never adequately reflect economic activities, a purpose for which it was not originally designed.

Accounting figures can neither express the economic values of assets held by a firm, nor the economic income from the utilization of such assets. As for the latter, accounting profits include holding gains on inventories and depreciable assets arising from continuous inflation, and cannot differentiate them from genuine economic income. Therefore, it is necessary to estimate rates of return on capital that differ from accounting rates of return. However, corporate accounting is a unique, important and the richest source of information on the firm's activities. Perhaps the best way of estimating economic profitability is to convert accounting data into a kind of inflation accounting data.

We have performed two measurements of the economic rate of return on capital in postwar Japan. One of them was performed five years ago for the purpose of estimating the profitability

of the total nonfinancial corporate sector and the manufacturing corporate sector based upon macro data; i.e. national income accounts and other economic statistics. The other measurement is a recent calculation on industrial groups using their annual reports. The latter measure employed over eight hundred listed companies classified into three macro and thirty-three individual industries. The sample period, however, covered the rather short time span of fifteen years between 1965 and 1979. The sample period of the former measure covered the slightly longer period between 1956 and 1974. Utilization of national income statistics as the main data base constrained us to classify the economy into only two macro sectors as stated above. Fortunately for such macro level calculations, we could easily lengthen the estimation period by another five years by using the new system of National Accounts (the new SNA) although this sacrifices some continuity in the data definition. Consequently, the sample period for measures based on national income accounts can be lengthened to cover the period 1970 to 1979.

In this paper, the discussion of the long-term trend of profitability on capital is based mainly on twenty-four years' time series data. Using the estimated returns for the industrial sectors, we derive some implications for the movement of rates of return during the last fourteen years. We analyse some relationships between the rates of return on capital and some other important economic concepts.

II. THE ESTIMATION METHOD

A. The Macro Level Estimation

As already stated, total corporate rates of return (for the nonfinancial sector and manufacturing sector) were estimated mainly by use of national income accounts. The measurement based on the old SNA is as follows. First, nominal returns on equity and on debt were calculated. Then the "valuation adjustment" amounts for inventories and for depreciable assets were estimated and subtracted from the above nominal returns to calculate real returns - returns after valuation adjustment - on capital. Then, current values of capital stocks are estimated, and rates of return were calculated as real returns divided by capital stocks.

The measurement in the new SNA is much more simple. The new SNA offers data on real returns, except depreciation, although they are broken down into parts. It also measures physical capital stocks in real terms. So, what is necessary in this case is only a revaluation of depreciation.

1. Return on capital

First, corporate income (before and after tax) of the total sector and the manufacturing sector was estimated by a matrix of "Composition of Main Factor Income by Industrial Origin of Net National Product at Factor Cost" included in the Annual Report of National Income Statistics (Economic Planning Agency). Secondly, interest paid by the corporate sector was measured. There were no ready-made statistics for this value. Therefore, outstanding corporate loans and bonds by financial institutions and interest rates on the loans and bonds were calculated respectively using the

Economic Statistics Annual (Statistics Department, the Bank of Japan). The interest paid was estimated as the product of these two factors. The corporate income (before and after tax) and the interest paid were summed up to the nominal return on capital (before and after tax).

Inflationary adjustment for inventories sold and depreciation must be deducted from the nominal return to calculate real return on capital. As for inventories adjustment, National Income Statistics already contains the relevant figures which are used in this study.

Adjustments for depreciation were considerably complex. First, calculations of the stock of depreciable assets in current prices were carried out. Then, we calculated both gross fixed capital formation and depreciation values from accounts contained in the National Income Statistics. Estimation of economic depreciation, which is depreciation based on the current prices of depreciable assets, was carried out by the following equation.

$$TA_t = \frac{P_t}{P_{t-1}} \cdot TA_{t-1} + I_t - D_t^*$$

TA_t = amount of depreciable tangible fixed assets at end of period t;

P_t = wholesale price index for investment goods in period t;

I_t = amount of gross fixed capital formation in period t;

D_t^* = economic depreciation.

The difference between accounting depreciation and economic depreciation is called the valuation adjustment for depreciation, i.e. the excess or deficit depreciation caused by price changes in depreciable assets. Before and after tax real return on capital,

thus, was calculated as the nominal return on capital (before and after tax) less these two valuation adjustments.

The above calculations were for estimations based on the old SNA. In the case of measures using the new SNA, we could calculate nominal nonfinancial corporate income after inventory valuation adjustment (before and after tax) and interest paid by the nonfinancial corporate sector directly and easily. But depreciation values were based on accounting concepts and had to be transformed into economic values.

Here we used one of the results from measurements for listed companys, which will be explained in the following section. We applied the "revaluation ratio" of depreciation to the depreciation values from the new SNA to calculate economic depreciation values. In this way, we could estimate excess or deficit depreciation more easily than in case of the old SNA. The estimation of valuation adjustment for inventories follows the same procedures as in the case of the old SNA.

2. Capital and the rate of return

The new SNA estimates the current prices of firms' physical assets, but not financial assets. So, we can take values of total assets directly from it. In case of the measurement based on the old SNA, we calculated current values of depreciable assets only. We regarded book values of inventories to be equal to current prices, because average inventory periods were very short and the difference between current prices and book values was negligible.

In case of the measurement by use of the old SNA, we could not help but forego revaluating lands at current prices. We cancelled

the accounts receivable and payable on both sides of the balance sheet. So, real capital is slightly understated. The rate of return was calculated as the real return divided by real capital.

The rate of return was calculated both for the total nonfinancial sector and the total manufacturing sector in case of the old SNA, but restrictions on data did not allow us to calculate the manufacturing sector's rate of return in the new SNA.

B. Estimation Based on Listed Company's Data

1. Sample and data

Our purpose is to measure the profitability of the listed companies in contrast to the previous study on all corporations based on the National Income Statistics. On listed companies we can obtain necessary detailed financial data much more easily than for the whole corporate sector.

The main data employed for this purpose was The Data Base Nikkei Financials or the so-called NEEDS data provided by the Nihon Keizai Shimbun, Inc. (The Japan Economic Journal, Inc.). This data base contains the financial statements of all the companies listed on the Tokyo Stock Exchange (TSE) and also their industrial aggregate statements.

In order to avoid double counting, financial industries are excluded. Consequently, our sample consists of 33 industries, which were aggregated into three groups, that is, All, Manufacturing and Nonmanufacturing Industry. Sample industries and the number of firms included in each are shown in Table 3. Our sample is limited to firms listed on the First Section of T.S.E., so it contained 829 firms, which accounted for about one third of assets, one quarter of sales and one third of returns on capital of all the firms in Japan in 1978.[1)]

Although NEEDS provided a fifteen year period of time-series data from 1965 to 1979 fiscal year[2)], this period was not long enough to fully analyze time trends. Nevertheless, the use of NEEDS was very advantageous because it supplied much detailed information about business activities.

Other important data sources were as follows:

Economic Planning Agency, Annual Report on National Accounts,
The Ministry of Home Affairs, Survey of Fixed Assets' Prices,
National Land Agency, Public Announcement of Land Prices,
The Bank of Japan, Prices Indexes Annual
Economic Statistics Annual
Japan Securities Research Institute,
The Rates of Return on the Listed Stocks

Notes

1) The number of non-financial corporations listed on the First Section was 939 and that of financial corporations was 97 in March, 1979. We included the category of "other Finance" because it was composed of the consumer finance

industry and leasing industry.

2) Data for certain fiscal years are based on the aggregated financial statements of the companies whose accounts cover the period from April in one year to March of the next year.

2. Capital

Firms' assets are classified into two major groups. One group consists of physical assets which take direct part in production activities. The other group consists of financial assets. The former assets are further classified into tangible fixed assets, intangible fixed assets, inventories (materials, unfinished goods and finished goods) and others. Tangible fixed assets are furthermore classified into depreciable assets such as buildings and equipment and non-depreciable assets such as land. Cash and its equivalent, marketable securities, accounts receivables, loans and other investments are included in financial assets. Here we regard as the standard case (case I), situations in which both physical and financial assets are included in total capital. The case where only physical assets are included in total capital is called case II.

We revaluated depreciable tangible assets (referred to below as merely depreciable assets), land and inventories among physical assets. It is almost impossible to revaluate intangible assets at current prices, so we regarded book values to be equal to current prices.

As for financial assets, current prices of marketable securities and other financial assets are significantly different from book values. Since their weight in

total assets is negligibly small, however, and since their revaluation has many attendant difficulties, we did not revaluate them.

a) Inventory

Book values (B.V.) of inventory assets at the end of fiscal years were transformed into current or replacement values by use of both estimated turnover ratios of inventories for each industry and the wholesale price indexes (WPI). The price indexes used were different for every industry according to the inventory assets typical for the industry. Assuming FIFO, current values of inventories are calculated as follows.

$$\left(\begin{matrix}\text{Current value}\\ \text{of inventories}\end{matrix}\right) = \left(\begin{matrix}\text{Book value}\\ \text{of inventories}\end{matrix}\right) \times \left(1+\frac{1}{2}\times\frac{\text{B.V. of inventories}}{\text{Cost of sales}}\times\text{Change in WPI}\right).$$

The ratio of B.V. of inventories to cost of sales in a profit and loss statement is the inverse of the turnover rate of inventories, and expresses an average holding period of inventories between acquisition and sale. On the assumption that both production rate and sales rate are equal and constant, we multiplied book values of inventories by one half to calculate average lapsed time for inventories.

b) Depreciable assets

Depreciable fixed tangible assets, or rather, <u>depreciable assets,</u> were revaluated in almost the same way as inventories.

$$\left(\begin{matrix}\text{Replacement value of}\\ \text{depreciable assets}\end{matrix}\right) = \left(\begin{matrix}\text{Book value of}\\ \text{depreciable assets}\end{matrix}\right) \times \left(1+\left(\begin{matrix}\text{Change in price index for investment goods}\\ \text{during the age-life of depreciable assets}\end{matrix}\right)\right)$$

Composition of depreciable assets is quite different by industries. The weighted average of price indexes of individual depreciable assets was used as the price index for investment goods. Average age-life in the above equation was estimated as follows.

$$\left(\begin{matrix}\text{Average}\\ \text{age-life}\end{matrix}\right) = \frac{\log\left(1-\frac{\text{Accumulated depreciation}}{\text{Accumulated plus depreciable assets}}\right)}{\log\left(1-\frac{\text{Depreciation}}{\text{Depreciable assets plus depreciation}}\right)}.$$

Here it is assumed that depreciation was carried out by the fixed rate method. This assumption seemed to be plausible upon consideration that more than ninety percent of listed companies employed this method.

Because of restrictions on data we had to assume that every depreciable asset has the same age-life.

c) Land

The replacement value of land was estimated by the following equation.

$$\left(\begin{matrix}\text{Replacement value}\\ \text{of land}\end{matrix}\right) = \left(\begin{matrix}\text{Area measured in}\\ \text{square kilometers}\end{matrix}\right) \times \left(\begin{matrix}\text{Land price per}\\ \text{square kilometers}\end{matrix}\right).$$

Current land prices are different from location to location and from use to use. We used different land prices for industries according to their location and use.

The current values of land of the above three assets for the aggregate industries (All, Manufacturing and Nonmanufacturing) were calculated by summing up each industry's land holdings' current values.

3. Real or economic return on capital

The computational definition of accounting return on capital is the sum of ordinary profit and interest and dividends received. Since capital is defined as total physical assets in case II, interest and dividends are not included in the return on capital. As stated before, real or economic return on capital is calculated as the accounting return minus adjustment of cost of sales and depreciation.

We made adjustments of the calculated value of increase or decrease in cost of sales and of excess or deficit depreciation and transformed "accounting return" into "adjusted or real return".

a) Adjustment for cost of sales

Adjustment for cost of sales could be changed to the problem of so-called inventory valuation adjustment (IVA) as follows.

$$\left(\begin{matrix}\text{Adjustment of}\\ \text{cost of sales}\end{matrix}\right) = \left(\begin{matrix}\text{Cost of}\\ \text{sales}\end{matrix}\right) \times \left(\begin{matrix}\text{Change in WPI during}\\ \text{average inventory period}\end{matrix}\right).$$

Average inventory period was defined as the ratio of average inventory to cost of sales Using this definitional relationship, the above equation could be rewritten into the following expression.

$$\left(\begin{matrix}\text{Adjustment of}\\ \text{cos of sales}\end{matrix}\right) = \left(\begin{matrix}\text{average}\\ \text{inventry}\end{matrix}\right) \times$$

(Change in WPI during the accounting period).

Different wholesale price indexes were applied to different industries in just the same way as in the revaluation of inventory assets.

b) Economic depreciation and valuation adjustment for depreciation

Excess or deficit depreciation results from the accounting rule that depreciation is reported on the basis of the historical value of the depreciable asset. Economic depreciation based on the replacement value of the asset must be the replacement costs that will maintain existing capacity. We regarded the balance of accounting less economic depreciation as the estimated excess or deficit depreciation.

Economic depreciation for depreciable fixed tangible assets could be calculated using revaluated values of depreciable assets.

$$\left(\begin{matrix}\text{Economic}\\ \text{depreciation}\end{matrix}\right) = (\text{Depreciation}) \times \left(\frac{\begin{matrix}\text{Revaluated}\\ \text{depreciable assets}\end{matrix}}{\begin{matrix}\text{Accounting}\\ \text{depreciable assets}\end{matrix}}\right) \times \left(1+\begin{matrix}\text{Average price change in depreciable}\\ \text{assets during age-life estimated}\end{matrix}\right);$$

$$\left(\begin{matrix}\text{Excess or deficit}\\ \text{depreciation}\end{matrix}\right) = \left(\begin{matrix}\text{Economic}\\ \text{depreciation}\end{matrix}\right) - \left(\begin{matrix}\text{Accounting}\\ \text{depreciation}\end{matrix}\right).$$

The price indexes are those used in the revaluation of depreciable assets, and it is assumed that depreciation is determined based on the asset value at the beginning of an accounting period.

c) Real return on capital

Real return on capital is calculated as follows.

$$\left(\begin{matrix}\text{Real return}\\ \text{on capital}\end{matrix}\right) = \left(\begin{matrix}\text{Ordinary}\\ \text{profit}\end{matrix}\right) + \left(\begin{matrix}\text{Interest}\\ \text{received}\end{matrix}\right) - \left(\begin{matrix}\text{Excess or deficit}\\ \text{depreciation}\end{matrix}\right)$$

$$- \left(\begin{matrix}\text{Adjustment of}\\ \text{cost of sales}\end{matrix}\right)\left(1-\frac{\text{Depreciation in cost of sales}}{\text{Cost of sales}}\right).$$

The quantity in the last set of parentheses is an adjustment factor to prevent double-counting in adjustments since adjustments are already made in both cost of sales and depreciation. The above equation is for the standard case. In case II, interest and dividends received are excluded from the real return on capital.

4. The rate of return

Real rate of return (ROC) is defined as the following for calculation purposes.

$$\text{ROC} = \frac{\text{Real return on capital}}{\left(\begin{matrix}\text{Total revaluated assets at}\\ \text{the beginning of the period}\end{matrix}\right) \times \left(1+\begin{matrix}\text{deflator of}\\ \text{total asset}\end{matrix}\right)}.$$

We revaluate the capital stock at the beginning of a period by its current price. On the other hand, we assume that returns occur at the end of a period and that they are valuated at prices prevailing then. So, it is necessary for us to again transform the amounts of revaluated assets in concordance with prices prevailing at the end of the period.

The deflator of total asset is the average of price change in each asset weighted by its value in current price at the begining of each period. Here price change of non-revaluated assets is regarded as zero.

Nominal rate of return on capital is defined as follows.

$$\left(\begin{matrix}\text{Nominal}\\ \text{ROC}\end{matrix}\right) = \text{ROC} + \left(\text{deflator of asset}\right)$$

As explained earlier, this nominal rate of return differs from the accounting rate of return in that the latter includes only partial hoiding gain due to inflation and denominator is the book value of total assets.

5. The market value of firm and industry and the "q" ratio

A market value or gross value of a firm is defined as the sum of the market value of equity and the market value of debts. The former value is calculated by the product of a stock price times the number of outstanding shares. Debts are classified into marketable securities and nonmarketable loans. Estimation of market values of nonmarketable loans contains both conceptual and computational problems. On the other hand, calculating market values of marketable securities is not impossible though it is very difficult. In addition, short-term debts occupy a considerably large part of marketable securities, although the differences between the market values and the book values are not thought to be very large. Thus, we conclude that the market value of total debts does not differ much from book value. So, we do not estimate the market value of debt.

The aggregate value of firms' market values in a certain industry we treat as synonymous with the market value of the industry. We calculated Tobin's "q" ratio for each industry by dividing the market value of the industry by the replacement cost of total assets of the industry.

$$q = \frac{\text{Industry market value}}{\text{Industry's assets value in replacement cost}}$$

6. Rate of return to investors

The rate of return on capital calculated above connotes the profitability of a firm's economic activities. The profitability to investors, however, is not necessarily equal to the rate of return on capital.

The rate of return to investors, which is equal to cost of capital if several conditions are satisfied, was calculated as a weighted average of the rate of return on shares and the interest rate. It is also difficult to estimate actual market interest rates (for investors) associated with certain debt. We calculated the following rate as a proxy of the true average interest rate.

$$\left(\begin{matrix}\text{Rate of return} \\ \text{to creditors}\end{matrix}\right) = \frac{\text{Interest paid}}{\text{Interest-bearing debt outstanding}} .$$

The denominator is not total debt but the total of interest bearing-debt outstanding. We assume that the cost of servicing other debt is the same as the cost of servicing interest-bearing debt.

The rate of return to stockholders is usually defined as the following.

$$\left(\begin{matrix}\text{Rate of return} \\ \text{to stockholders}\end{matrix}\right) = \frac{\text{Dividends plus capital gain}}{\text{Stock price at the beginning of the period}} .$$

Actual rates of return are calculated as an average rate of increase in wealth ratios adjusted for ex-devidend and

for ex-rights of new stock issues.

The weighted average of the above two rates of return to investors is the nominal rate of return. The real rate of return to investors is calculated by deducting the relevant price change rate from the nominal rate.

7. Basic results of the estimation

Some basic results of above calculations are summarized in tables and figures at the end of this paper.

III. GENERAL MOVEMENT OF THE JAPANESE ECONOMY

The Japanese economy, which had been almost completely destroyed in World War II, recovered rapidly, suffered from a considerably serious inflation after the war, and achieved some stability near the middle of the 1950's. There were successive waves of investment in equipment, manpower surpluses, vast consumption demand, and important government policies in the allocation of key resources that supported the recovery of the economy. Thus, in 1953 the economy experienced good conditions for the first time since the war. Since then, Japan experienced prosperous periods in 1957, 1959-61, 1963, 1966-70 and 1980, but also tasted bitter recessions in 1958, 1962, 1965, 1971 and 1973 to 1974. Generally, the periods of prosperities were rather longer than the periods of recessions (Figure 1).

We can conveniently separate the period of 1955-80 into four characteristic periods, i.e. 1955 to 60, 1960 to 72, 1972 to 75 and 1975 to the present. The first period is the time of high growth rates and stable price levels. The second period can be characterized by high growth and high prices. The third period is rather short and a time of transition. The growth rate slowed down rapidly and inflation was great. The last and the present period, for the time being, can be said to be one of stable growth and stable price levels (Figure 4).

As stated already, the driving force of Japanese growth was large investments in equipment.

It must be noted that the fields of investment in equipment have changed dynamically, keeping pace with the movement in technical

innovations. We should consider marvelous the way in which Japanese firms could diversify their business activities and adapt to environmental changes. Capital investments were at first oriented to such industries as textile industries that were labor-intensive, because there was much cheap labor at the time. In the first half of the 1960's, there was a boom in capital investment in large-scale plants especially in heavy and petrochemical industries.

Since that time, there appeared some signs of labor shortage. The rise in wage levels began to accelerate. At the same time, rates of change in wholesale price indexes, which had been very stable and low, also began to rise along with consumer's price indexes. Therefore, the share of investments in labor saving facilities increased significantly (Figure 5).

Also, environmental damage became a growing social problem, and many firms were compelled to invest capital to repair and prevent such damage. Investments like this were rather great, and since they did not contribute to raising firm's productivity, they might have contributed to raising price levels and cutting down capital's profitability.

Rapid growth of capital stocks, led by investment in equipment, often resulted in overproduction and excess facilities. These were said to be principal causes of several recessions. Especially since entering into the early 1970's, the potential for troubles arising from excess facilities was realized as business conditions rapidly worsened with the onset of slightly restrictive monetary policies.

Business conditions tended to improve in the summer of 1971

due to expansionary government fiscal policies. However, the Nixon Shock and the upward revaluation of Yen then followed in rapid order. There was also a shift from the fixed rate system to a floating exchange rate system in early 1973. Again, the Japanese economy had to rise from recession in 1972 and 1973 but this time by means of easy money policies and by large-scale public investment budgets. Just at this time there occurred the Oil Crisis of the autumn of 1973, and Japanese economy was again damaged seriously by the sharp rise in the oil prices as were other advanced countries. Since business firms hit by this shock just when they were potentially vulnerable were from overinvestment in equipment, the performance of business firms dropped down in 1974.

However, Japanese firms commenced investment for cutting all kinds of costs, although overall growth rates of new investment were negative or much lower than before. Investments were done for energy-saving or oil-saving, automation and other rationalization purposes. By striving for efficiency, business performance returned to a certain acceptable level in 1976 and the economy successfully weathered the second oil crisis in 1979 rather easily. These past few years, capital investments have been reviving in such high technology industries as the medical and biochemical, electronics and precision instruments industries.

International trade has played a very important role during these periods, not only in overall economic growth, but also in the cyclical fluctuations of the economy until about 1965. Needless to say, the Japanese economy greatly depends on imports of both natural resources and industrial goods, as well as exports of

industrial goods. The free trade system is a critical factor for the Japanese economy.

During the long, favorable period from 1966 to 1970, the economy freed itself from the constraints of an unfavorable balance of international payments. Since then, payments have stayed generally in the black, but they have also aggravated inflation. After the changes in the exchange rate system, the surplus balance of payments continued and it was only after the New Dollar Defence Policy started by President Carter in 1978 that the balance of payments showed a deficit . Recently, the scale of Japanese international trade is increasing steadily under the conditions where the domestic economy is reviving independentry. Here, it must be noted that the weight of international trade is not more than fifteen percent of the GNP, and that this weight is far less than what many people have come to believe it has been.

IV. TRENDS IN PROFITABILITY FOR THE TOTAL CORPORATE SECTOR

The rates of return (before tax) of the non-financial and manufacturing corporate sectors are shown in Fig. 2 & Table1,2. Five-year moving averages are also displayed to illustrate trends. For the total corporate sector, estimates based on the new SNA are also displayed. It must be noted that the estimates from the old SNA are based on the book values of land, as opposed to those of the new SNA which are based on market values. Thus, there should be some differences between these two time series. In spite of such differences, however, we can still trace the movement of the rate of return. The first phase is the slightly upward trend of 1956 to 1966. The second phase is the falling trend of 1966 to 1975, and, the third is the very gentle upward slope to the present.

The first phase just coincides with the period when there occurred high growth in capital investment in equipment and the consequent high economic growth in GNP. The second phase is the period when business firms suffered from overinvestment in equipment as well as considerably large increases in wage rates because of labor shortages. Consequently, the very high rate of capital stock accumulation exceeded the high growth of the GNP while, at the same time, the share of capital returns in Net Domestic Product remained at a rather stable level. Thus, there appeared a falling trend of capital profitability. After 1970 the trend was accelerated, but we can think of that trend as one aspect of a long-term cyclical fluctuation in business activity. Then there occurred the first oil crisis which caused a momentary hyperinflation and changed the basic worldwide economic environment. As far as is shown in these

figures, the Oil Crisis pushed the rates of return down to an even lower level, but we must take the concurrent low operation levels into account. Although the world and the Japanese economy's slowed down growth was unavoidable (Figure 1) , it does not necessarily mean that the rates of return on capital should remain at a lower level. If demand, external and internal, can be created by appropriate capital investment and by international trade in the near future, there must be some possibility that rates of return will rise again.

As contrasted to the movements in all industry, the aggregate manufacturing industry's rates of return exhibit a consistently falling trend. This phenomena suggests three important facts. The first is that manufacturing industries offered many a profitable opportunity at the beginning of the sample period. Secondly, as the progress of accumulation in invested capital in manufacturing industries continued, profitable investment opportunities declined early in the period. In other words, the marginal rate of return on capital was decreasing from the onset of the period. The third fact is that relatively profitable investment opportunities appeared in other sectors other than in manufacturing industries. In fact, capital investments in nonmanufacturing industries have been increasing especially since the middle 1960's.

V. ANALYSIS OF THE INDUSTRIAL RATES OF RETURN OF LISTED CORPORATIONS

In this section, we analyze some relations between the rates of return and other important economic variables, and relations between a few concepts relevant to capital activities and other variables. Since we are especially interested in the transition period from 1965 to the present, we confine our analyses to the estimates of the rates of return for listed corporations subsequent to 1965.

The time-series of rates of return for individual industries are considerably correlated with those for all industry. In other words, they share systematic risks if we regard the total industry's rates of return as an index of movement in some basic economic factors. In addition to this fact, our space is limited, so we principally follow the movements of the all non-financial and total manufacturing industries.

A. The ROC's and GNP

As stated above, the level of rates of return on capital (ROC) is, ceteris paribus, a function of the real rate of growth in GNP. Real rates of return before tax for all (non-financial), manufacturing and nonmanufacturing industries are respectively regressed on the real growth rate of GNP.

Industry	Constant (t-value)	Regression Coefficient (t-value)	Coefficient of Determinant	Durbin-Watson statistic
All	0.72 (1.81)	0.34 (7.36)**	0.82	1.60
Manufacturing	0.67 (1.94)	0.42 (10.79)**	0.67	1.75
Non-manufacturing	0.89 (1.75)	0.21 (3.61)**	0.52	1.49

* denotes significance at 5 percent level, and **, at 1 percent level.

We can certainly find an intimate positive relation between the ROC's and changes in GNP. The ROC is a decreasing function of the difference between growth rates of investment in equipment and growth rates in GNP, if other factors remain constant. This is because rates of increase in capital stock growth exceeding the rates of increase in the product of capital growth, must necessarily depress rates of return.

The rate of increase of fixed capital by the private sector in the New SNA is taken as an index of the rate of increase of overall capital stock.

The ROC for the all industry is regressed on the difference between this rate and the real growth rate of GNP.

$$\left(\begin{matrix}\text{Real rate}\\ \text{of return}\end{matrix}\right) = \underset{(8.39)^{**}}{3.10} - \underset{(-2.27)^{*}}{0.37}\ (\text{the difference}), \quad R^2 = 0.30 .$$

B. Time Trend of ROC

The rates of return on capital by industries are shown in Table 4 and Figure 7.

During the sample period, the ROC began to decline gradually from a peak in 1967 to a low in 1974, but the decline was accelerated by the Oil Crisis, and the ROC dropped to a low in 1974. But thereafter the ROC recovered from the low to the original trend line.

Compared with the accounting rate of return, the movement of the real ROC is quite different. There are not only differences in peaks and troughs, but they also often reverse their direction of change . In addition, the variability of the accounting ROC is bigger than real ROC's variability. The reason may be that the accounting ROC includes part of nominal holding gains which fluctuate in accordance with price level changes. Accounting ROC shows, however, a different movement from the nominal ROC that includes all holding gains. These tendencies can be seen both in the total industries and the manufacturing industry group.

The simple mean as well as the standard deviation of the time series are bigger in the manufacturing industry than in all industry.

"The Real Rate of Return on Capital"

	Mean	S.D.
All industry	0.034	0.015
Manufacturing	0.040	0.018

The regression on a time variable leads to the following results.

	Constant (t-value)	Coef. of Regression (t-value)	Coef. of Determinant	DW statistic
All industry	5.817 (10.00)**	-0.289 (-4.66)**	0.645	0.851
Manufacturing	6.920 (10.10)**	-0.346 (-4.75)**	0.653	0.889

The time variable range from 2 (=1966) to 15 (=1974) in the regression. It does not mean that a falling trend is identified statistically. The time regression was performed for individual industries. Thirty-four industries among thirty-six industries, including the three aggregated industry groups, have negative coefficients for the time variable, and among them twenty-nine industries' coefficients are significant at the five percent level. Two positive estimated coefficients are neither significant. (See Table 13.)

We also calculated the rate of return on "physical" capital. In this case, capital is defined as total assets less financial assets. Correspondingly, the return on this capital is defined as the return on total capital less income from financial assets.

"Rate of Return on Physical Capital"

	Mean	S.D.
All industry	0.034	0.023
Manufacturing	0.043	0.027

There is only a slight difference in the mean levels between the total and the physical rates of return. However, fluctuations in the physical rates of return are larger. This fact suggests that returns on financial assets tend to stabilize the returns on total capital.

C. Effective Tax Rates

Some people assert that capital must bear the excess burden of corporate tax under inflasion since, the tax is imposed on accounting income. We define the following ratio.

nominal tax rate =tax payed actually /accounting capital incom

effective tax rate = tax payed actually / real return on capital

We also calculated effective tax rates for equity capital.

Taxation on holding gains certainly raises the effective tax rate. On the other hand, since interest paid on debt capital can be deducted from taxable income, the use of debt of leverage lightens the tax burden. This effect is called the tax shield effect of debt capital. Therefore, the excess tax burden due to holding gains, ceteris peribus, could be lessened by increasing leverage. However, the effective tax rate on returns on equity capital cannot be decreased by debt.

The effective tax rate, as shown in Fig.8 & table 5, is higher than the nominal tax rate. The differences in these two tax rates are proportional to the rate of inflation and are, thus, getting wider. It must be noted that nominal tax rates as well as effective tax rates have upward trend. This is because firms did not utilize leverage to exercise the tax shield effect, although tax authorities have raised the tax rate substantially on taxable income. (See Figure 8) We do not raise questions here as to why this has been so, however.

Although we cannot infer that business firms purposely utilize the leverage effect as a tax shield through the time series data (for all industry and nonmanufacturing industry), the tax shield effect can be observed in the cross-section data (Table 5-1,2 and

Figure 8). The average effective tax rates are regressed upon the average equity-to-total capital ratio for each industry, excluding the three aggregated industry groups and two extraordinary industries, mining and the railroads.

$$\left(\begin{matrix}\text{Effective}\\ \text{tax rate}\end{matrix}\right) = \underset{(1.1)}{6.34} + \underset{(4.3)^{**}}{0.684}\left(\begin{matrix}\text{Equity-to-total}\\ \text{capital ratio}\end{matrix}\right), \quad R^2 = 0.39$$

This equation implies that high equity-to-total capital ratios (i.e. leverage at low levels) bring about heavier burdens of corporate tax.

D. Inflationary Influences on the Rate of Return

The Japanese Economy has experienced considerably high inflation at least until 1975 by international standards. ((Figure 4)) It experienced extraordinarily high inflation rates (in WPI) of over twenty percent, particulary in 1973 and 1974, because of the First Oil Crisis. But inflation was largely suppressed after 1977, and the Second Oil Crisis could exercise only a slight influence on price levels, especially on the CPI, owing to rationalization in business firms and the lowered rates of increase in wages. What influences has inflation exercised on the real ROC then?

We have shown that the ROCs (of the aggregate nonfinancial and manufacturing industry) have a strong correlation with the real growth rates in GNP which can be considered an index of economic and business activities. It is empirically known in Japan that cyclical prosperity raises price levels sooner or later, and that inflation then suppresses demand, and that business conditions eventually take a recessionary turn. Thus, the rate of charge in GNP is negatively correlated with the inflation rate. We have regressed the growth rates of real GNP on the CPI and a time variable. Here, the time variable (one in 1965 and fifteen in 1980) is introduced to express a falling trend due to a shift from a high growth rate economy to a low growth rate economy.

$$\begin{matrix}\left(\begin{matrix}\text{Growth rate of}\\ \text{Real GNP}\end{matrix}\right) = \underset{(12.273)^{**}}{16.409} + \underset{(-4.826)^{**}}{-0.618\ (\text{CPI})} + \underset{(-4.002)^{**}}{-0.415\ (\text{Time})}. & \bar{R}^2 = 0.814 \\ & \text{D.W.}=2.01\end{matrix}$$

Because the ROC is correlated with the GNP and because the GNP is correlated with the CPI and time, the ROC is logically correlated with the CPI and time. Here it is meant that the declining trend in GNP and in ROC are just concurrent. It must be noted that a declining

trend in GNP does not cause the trend in ROC, although these changes in GNP influence ROC's. We would understand that the falling trend in ROC is a cyclical phenomenon resulting from inefficiencies in business activities caused by excess facilities and so on. On the contrary, the falling trend in GNP implies some structural change in the economy.

There is the possibility that inflation exercised some influence via other means. For example, inflation might have suppressed returns on capital by pushing costs up, as opposed to pulling demand down. Simple correlation coefficients were calculated between the ROC and the CPI, WPI and GNP deflator (PG). The highest correlation was the one for the CPI, and the lowest was for the GNP deflator, but we cannot, of course, determine the effects of inflation from this.(See Table 6 for correlations by individual industries.)

Regressions for ROC before Tax

	Constant	CPI	WPI	PG	R^2	DW
All Industry	4.953 (8.71)**	-0.200 (-3.30)**			0.48	0.19
	4.041 (6.87)**	-	-0.122 (-3.14)**	-	0.45	0.40
	4.644 (10.70)**	-	-	0.184 (-2.22)*	0.29	0.18
Manufacturing	5.810 (8.33)**	-0.231 (-3.10)**	-	-	0.44	0.29
	4.648 (9.22)**	-	-0.121 (-2.32)	-	0.31	0.51
	5.411 (6.56)**	-	-	0.207 (-2.03)**	0.26	0.23

Theoretically, the effective tax rate is increased through the expansionary effects inflation has upon taxable income. The results of regressions of before and after tax ROC on various indexes, however, are contrary to our theoretical expectations.

Regressions for ROC after Tax

	Constant	CPI	WPI	PG	R^2	DW
All Industry	3.937 (7.03)**	-0.188 (-3.15)**	-	-	0.45	0.15
	3.112 (8.74)**	-	-0.121 (-3.29)**	-	0.47	0.16
	3.649 (5.55)**	-	-	0.174 (-2.15)*	0.28	0.32
Manufacturing	4.623 (6.83)**	-0.224 (-3.10)	-	-	0.44	0.19
	3.554 (7.58)**	-	-0.127 (-2.63)	-	0.41	0.41
	4.247 (5.33)**	-	-	0.201 (-2.05)	0.37	0.45

Inflation brings about the "debtor's profit" to equity capital in cases where loans are contracted in money terms. In this context, the rate of return on equity may be increased by inflation. However, the regression analysis of the rate of return on equity (all industry) suggests that the negative effect of inflation already stated is stronger than this positive effect.

$$\left(\begin{array}{c}\text{Real ROC on}\\ \text{Equity}\end{array}\right) = \underset{(5.25)}{10.795} - \underset{(-4.41)}{0.474}(\text{CPI}), \quad R^2 = 0.25$$

$$4.914 \quad - 2.022 \qquad D.W. = 0.976$$

E. Accounting ROC and Real ROC

As pointed out already, accounting rates of return move quite differently from real rates of return, at least cyclically. We regressed the real rates of return on the accounting rate of return in order to see how much the accounting rate of return explained the variation of the real rate of return for the all industries.

$$\left(\begin{matrix}\text{Real}\\ \text{ROC}\end{matrix}\right) = \begin{matrix}-2.4\\ (-1.12)\end{matrix} + \begin{matrix}0.69\\ (2.712)^{*}\end{matrix} \left(\begin{matrix}\text{Accounting}\\ \text{ROC}\end{matrix}\right), \quad \bar{R}^2 = 0.38, \ DW = 1.14.$$

The regression coefficient for accounting rate of return is positive and significant at the five percent level, but the accounting rate of return explains less than forty percent of variations in the real rate of return.

The accounting rate of return explains variation in the nominal rate of return , however by more than 50 percent.

$$\left(\begin{matrix}\text{Nominal}\\ \text{ROC}\end{matrix}\right) = \begin{matrix}-10.31\\ (-1.93)\end{matrix} + \begin{matrix}2.32\\ (3.69)\end{matrix} \left(\begin{matrix}\text{Accounting}\\ \text{ROC}\end{matrix}\right) \qquad R=0.53, \ DW=1.76.$$

Average real ROC by industries was regressed on its average accounting rate of return to see whether accounting rates of return can explain industrial differences in real rates of return.

$$\left(\begin{matrix}\text{average real}\\ \text{ROC}\end{matrix}\right) = \begin{matrix}-1.05\\ (-0.85)\end{matrix} + \begin{matrix}0.56\\ (4.361)^{**}\end{matrix} \left(\begin{matrix}\text{average}\\ \text{accounting ROC}\end{matrix}\right), \quad \bar{R}^2 = 0.38.$$

A similar cross sectional regression was also performed for the nominal rate of return.

$$\left(\begin{matrix}\text{average}\\ \text{nominal ROC}\end{matrix}\right) = \begin{matrix}4.69\\ (6.38)^{**}\end{matrix} + \begin{matrix}0.58\\ (7.51)^{**}\end{matrix} \left(\begin{matrix}\text{average}\\ \text{accounting ROC}\end{matrix}\right), \quad \bar{R}^2 = 0.65.$$

Revaluation ratios of individual assets for all industry are shown in Fig,10 &Table 9. The revaluation ratio is defined as the

ratio of value of revaluated assets divided by book value . They are, in general, considerably low and stable until 1972, but shift to a higher level in correspondence with rapid rise in price levels after the First Oil Crisis. The revaluation ratio of depreciable assets shows a characteristic movement. It rose sharply after 1973 and 1974. The movement is correlated both with average age-life and with price changes in depreciable assets. Average age-life was lengthened to longer than five years after 1973. It will be clear that the longer the average-life, the bigger the revaluation ratio. See Fig.11 for average age-life and inventory period figures. Fig.12 contains the deflators for nominal capital assets, which shows the rate of holding gains.

Revaluation ratios of inventory assets are very small and almost negligible throughout the period. On the other hand, those of land are very high and over fifteen throughout the period. The revaluation ratio of return on capital remained at considerably high levels except for immediately after the First Oil Crisis. It has not entirely returned to its previous 1972 level. The portion of holding gains in nominal returns very high especially during years about Oil Shock industry.

F. ROC Differentials and Risk

Now, we discuss, throuth the movements of ROC by industry, whether changes in industrial structure have been carried out appropriately, or whether economic resources have been allocated to industries efficiently. Efficient resource allocation must bring about a reasonable trade-off between expected return and risk. In addition, if there exists any inefficiency at first, and if it disappears gradually under competitive conditions, the degree of

dispersion of industrial ROC will converge to within a certain range.

In Figure 17-1 and 17-2 is drawn each industrial time-series' ROC curve for manufacturing and for nonmanufacturing industries respectively. The curve which shows sharp drops both in 1974 and in 1979 is that of the petroleum industry which was damaged by the first and second oil crisis. If this industry is neglected as an exception, there can be seen some tendencies for ROC differentials between industries both for the manufacturing and the non-manufacturing groups. That is, as far as real rates of return on capital are concerned, it can be said that industrial coordination has been carried out smoothly to an efficient state. However, it is very interesting that the dispersion was widened in 1979.

The trade-off between returns and risk are represented in Figure Fig. 13 by points which expresse the combination of the mean and the standard deviation for individual industries. No investment opportunities should ever be undertaken unless it could earn a return corespondent to its risk.

The relevant rate of return in case of investment decisions is the expected rate of return for the investment opportunity. But since such information is never available, we utilize actual means and standard deviations instead during the estimation period. In Figure 13 , as stated above,are drown points of mean and standard deviation pairs, except for a few industries which are thought to be protected by entry barriers.

We can identify the trade-off both by the figure and by the regression analysis as follows.

$$\underset{\text{ROC}}{(\text{average of})} = \underset{(3.4)^{**}}{8.77} + \underset{(4.5)^{**}}{0.23}\ (\text{S.D. of ROC}) \quad , \quad R^2 = 0.45 .$$

Considering that effective tax rates differ by industries due to the Tax Measure Laws, we employed regression analysis for real rates of return after tax.

$$\underset{\text{after tax}}{(\text{average ROC})} = \underset{(3.2)}{7.54} + \underset{(5.1)}{0.33}\ (\underset{\text{ROC after tax}}{\text{S.D. of}}) \ , \ R^2 = 0.51 .$$

Both analyses, we can say, suggest efficient allocation of capital goods among industries.

G. Tobin's "q" Ratio and its Stability

Tobin's "q" does not have any trend overall, but not a few industries show upward trends which are significant statistically (Table 10,11). Every industry has a peak in 1972, when the problem of excess liquidity in the economy brought about by an easy money policy took place. (Fig.15)

In addition to its stability, that the "q" level was constantly below one is also noted. This means that there were opportunities to earn gains by purchasing stocks and debts in capital markets and selling real capital in asset markets. Here lies a very interesting problem to be analysed in what follows.

But it is more important "q" is highly stable. The fact "q" is consistently very low, on average 0.65,however,suggest to us that there are some large adjustment cost in Japanese economy.

For example, the relative cost of financial and physical asset sales for Japan and other countries may differ. For this reason and the international differences in accounting practices, measured Tobin's "q" for Japan and other nations may necessarily differ. Even though it is difficult to make international comparisons in "q's" size, it is nevertheless remarkable that "q" has been relatively stable in Japan.

Although the economic relation is not yet clear, the regression analyses of "q" ratios against the growth rate of real GNP yields good statistical results for the three aggregate industry groups.

Industry	Constant (t-value)	Regression Coefficient (t-value)	Coefficient of Determinant	Durbin-Watson statistic
All	0.67 (91.20)**	-0.0029 (-3.09)**	0.42	1.42
Manufacturing	0.68 (78.04)**	-0.0026 (-2.33)**	0.30	1.63
Non-Manufacturing	0.66 (75.17)**	-0.0031 (-2.78)*	0.37	0.95

* denotes significance of 5 percent level,

** at 1 percent level.

Regressions upon the CPI were also performed. The results are as follows.

Industry	Constant (t-value)	Regression Coefficient (t-value)	Coefficient of determinant	Durbin-Watson Statistic
All	0.67 (88.26)**	-0.0023 (-2.78)*	0.37	1.10
Manufacturing	0.68 (76.17)**	-0.002 (-2.07)	0.25	1.35
Non-Manufacturing	0.66 (73.53)**	-0.0024 (-2.55)*	0.33	0.80

* denotes significance at 5 percent level,

** at 1 percent level.

The minus sign is an economically reasonable result comparable to that in the regression of "q" against real rates of return.

H. Rates of Return to Investors (RRI)

Rates of return to investors have such large fluctuations in both nominal and real terms that we cannot testify confidently to any economic hypotheses by the statistical analysis of time series. (Caiculated RRI is shown in Table 14 and Fig.12).

We want, however, to test the hypothesis that rates of return to investors are realized proportionally to the real rate of return on capital, using industry averages of both rates of return. Here, the post-tax ROC is employed because distributed returns on capital are post-tax returns.

$$\left(\begin{matrix}\text{Real rate of}\\ \text{return of investors}\end{matrix}\right) = \underset{(5.69)**(0.34)}{3.18 + 0.06}\left(\begin{matrix}\text{Real rate of}\\ \text{return on capital}\end{matrix}\right),\ \bar{R}^2 = 0.04.$$

The above regression is not significant statistically.

The relation between rate of return to stockholders and rates of return on equity capital, however, can be determined by regression analysis.

$$\left(\begin{matrix}\text{Real rate of}\\ \text{return to stockholders}\end{matrix}\right) = \underset{(8.15)**(2.99)*}{8.59 + 0.32}\left(\begin{matrix}\text{Real rate of}\\ \text{return on equity}\end{matrix}\right),$$

$$\bar{R}^2 = 0.22.$$

It is interesting that use of nominal rates of return as independent variables gives similar cross sectional regression results.

$$\left(\begin{matrix}\text{Nominal rate of}\\ \text{return to investors}\end{matrix}\right) = \underset{(5.43)**(0.03)}{11.19 + 0.007}\left(\begin{matrix}\text{Nominal post-tax rate}\\ \text{of return on capital}\end{matrix}\right),$$

$$R^2 = 0.00.$$

$$\left(\begin{matrix}\text{Nominal rate of}\\ \text{return to stockholders}\end{matrix}\right) = \underset{(14.45)\ (2.84)*}{16.70 + 0.32}\left(\begin{matrix}\text{Nominal post-tax rate}\\ \text{of return on equity}\end{matrix}\right),$$

$$R^2 = 0.20.$$

Under the assumption of the stationary state, Tobin's q ratio can also be calculated as a ratio of the rate of returnon capital to the rate of return to investors. The calculation results are shown in Table 10 as q'. The correlation of q and q' is very low. (See Fig. 16) So we can infer that the assumption of a stationary state is not acceptable in our sample period for the Japanese economy.

I. "Beta" coefficient of ROC

We calculated the "beta" coefficient for rates of return on capital by assuming the market model. Although this beta expresses systematic variation, this is not a relevant risk measure as it is in the case of investment in financial assets because investment in real assets cannot be completely diversified. The relevant risk measure must be not the systematic risk but the total risk. The beta for the ROC merely express the co-movement with individual industry's ROC and systematic factors i.e. the ROC of the all industry as a proxy.

The average value of the coefficients of determination for the individual industry's regressions is about .67, which means that nearly two-thirds of variation in an individual industry's ROC are, in average, explained by the ROC for all industry. (Table 14).

VI. SUMMARY

(1) The rate of return on capital for the aggregate nonfinancial corporate sector remained at a stable level, except for cyclical fluctuations, during the period between 1956 and 1970. However, a slight falling trend began from 1966, and that trend became more apparent from 1971 and was accelerating by the time of the First Oil Crisis. The rate of return picked up rapidly from its low of 1974, and since 1977 it has attained a stable level. It is still considerably lower than the level of the 1950's, however.

On the other hand, the rate of return for the manufacturing sector exhibited different movements similar to those of the total sector up untill 1966 ,since that year , however, have declined in a similar fashion.

(2) It is said that there were several big changes in the Japanese economy during this period. There was the first and the second liberalization of capital trade (1967, 1973), the upward revaluation of the Yen and a shift from the fixed rate system to the floating rate system (1971), the problem of excess liquidity in the economy (1972), the First and the Second Oil Crises (1973, 1979), the problem of excessive government bond issues (since 1975), and many other changes. No factor except the First Oil Crisis could independently exercise a great influence on the movement in rates of return.

(3) As far as the period between 1961 and 1974 is concerned, the movement of rates of return is correlated strongly with the growth rate of real GNP. It is also negatively correlated with one of the variables which represent overcapacity and with increases in

real wages. It can be said that the falling trend in rates of return has some relation to the overcapacity problem and to an increasingly changing wage structure.

(4) The effective corporate tax burden is correlated with price changes and has been increasing consistently during our sample period, especially since 1973. It must be noted that not only effective tax rates but also nominal tax rates have increased. This means that the corporate tax rate has risen substantially. Although cross industry analysis proves the existence of a tax shield effect of debt under inflation, industry,s time series data does not clearly show that firms positively utilized the effect of leverage.

(5) The real rate of return between 1961 and 1979, particularly the post-tax rate of return, is also negatively correlated with price changes. But the exact economic meaning of this relation is not necessarily clear.

(6) As for the relation between accounting ROC and real ROC is concerned, we cannot completely deny a role to accounting ROC as a proxy for real ROC. It is not always a good proxy, however.

(7) From a certain point of view, resource allocation among different industries seems to have been performed rather efficiently. We can see not only a tendency towards convergence in rates of return dispersion between industries, but also reasonable trade-offs between levels of industrial rates of return and risk.

(8) The movement of Tobin's "q"s is below 1 and remarkably stable over the period for aggregate industries and has no trend. Although all

And the very low level of "q" suggests the exsistance of some adjustment costs innegligible in Japanese economy.

(9) Real rate of return to investors is subject to considerably large fluctuations. By use of cross sectional data, we cannot find any significant relation between real rate of return to investors and real rate of return on capital. It is interesting, however, that we can see that the nominal rate of return to investors is correlated with nominal rate of return on capital in both cross industrial data and in time series data for individual industries.

BIBLIOGRAPHY

(1) Feldstein, Martin, and Lawrence Summers, "Is the Rate of Profit Falling?" Brookings Papers on Economic Activity, Vol.8, No.1 (1977), pp. 211-29

(2) Holland, Daniel M., and Stewart C. Myers, "Profitability and Capital Costs for Manufacturing Corporations and All Nonfinancial Corporations", American Economic Review, Vol.70, No.2 (1980), pp. 320-325.

(3) King, Mervyn A., "The United Kingdom Profits Crisis: Myth or Reality?", Economic Journal Vol.85, (1975), pp. 33-54.

(4) Liebling, Herman I., U.S. Corporate Profitability and Capital Formation; Are Rates of Return Sufficient?, Pergamon Press, 1980.

(5) Nordhaus, William D., "The Falling Share of Profits," Brookings Papers on Economic Activity, Vol.5, No.1 (1974), pp. 169-217.

(6) Okun, Arthur M., and George L. Perry, "Notes and Numbers on the Profits Squeeze," Brookings Papers on Economic Activity, Vol.1 (1970), pp. 466-73.

(7) Sandilands, F.E.P., Inflation Accounting, Report of the Inflation Accounting Committee, London: Her Majesty's Stationary Office, 1975.

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

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

(10) Von Furstenberg, Burton G. Malkiel, and Harry S. Watson, "The Distribution of Investment Between Industries: A Microeconomic Application of the "q" Ratio, in Government and Capital Formation, ed. by George M. Von Furstenberg, Ballinger Publishing Company, pp. 395-460.

(11) Wakasugi, Takaaki, Kazuhiko, Nishina and Moriaki, Tsuchiya "Trends in Returns on Capital in Postwar Japan", The Journal of Economics (The Society of Economics, University of Tokyo), Vol.42, No.2 (1976) and Vol.42, No.3 (1976).

(12) Wakasugi, Takaaki and Konya, Fumiko, "Rates of Return on Capital and Tobin's "q"," Keisokushitsu Technical Paper, No.52 (December 1980).

ILLUSTRATIONS

TABLES

Figure 1 Rates of Increase in Fixed Capital Formation by Private Sector

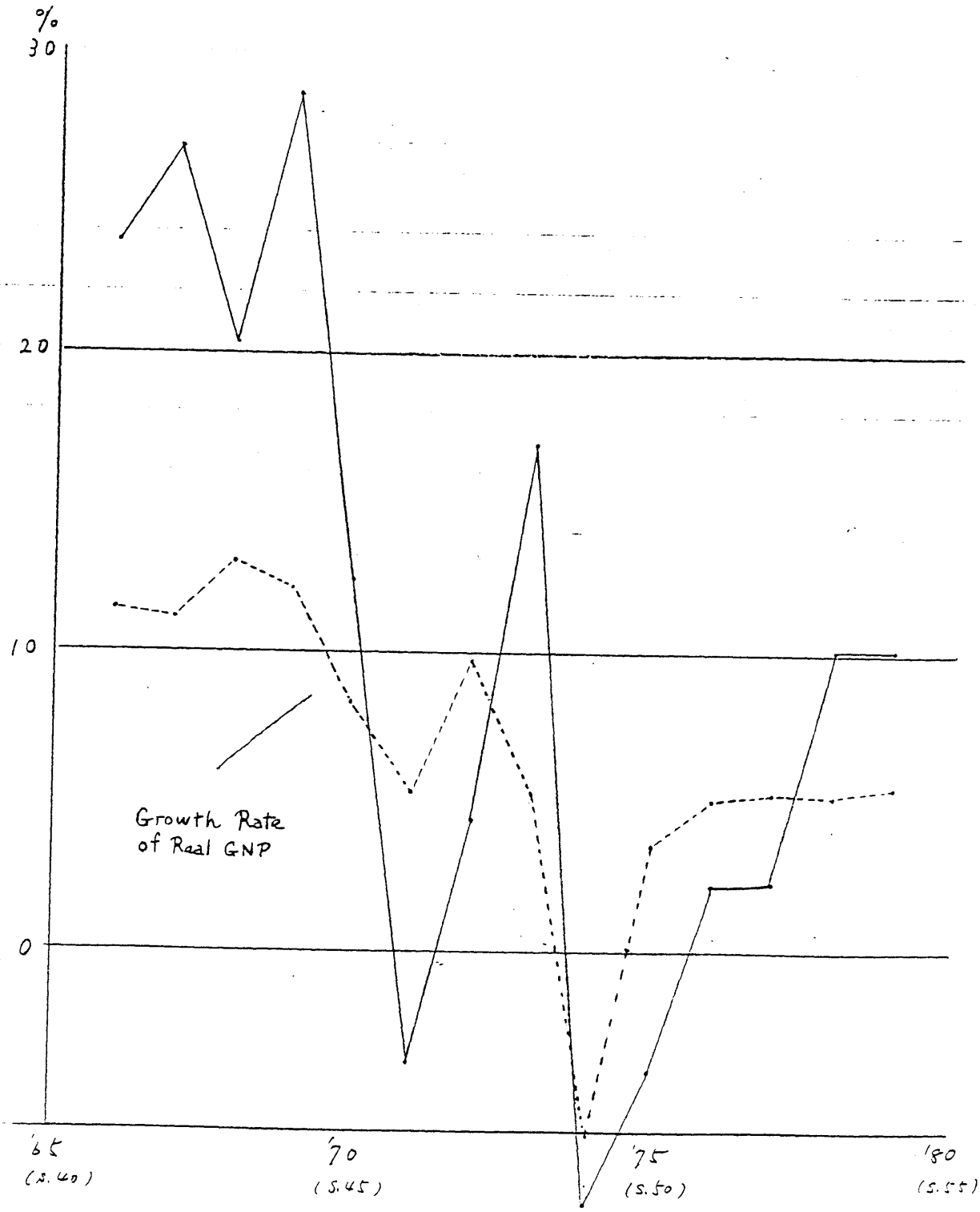


Figure 2 Pre-Tax Rates of Return on Capital

For Nonfinancial Corporate Sector

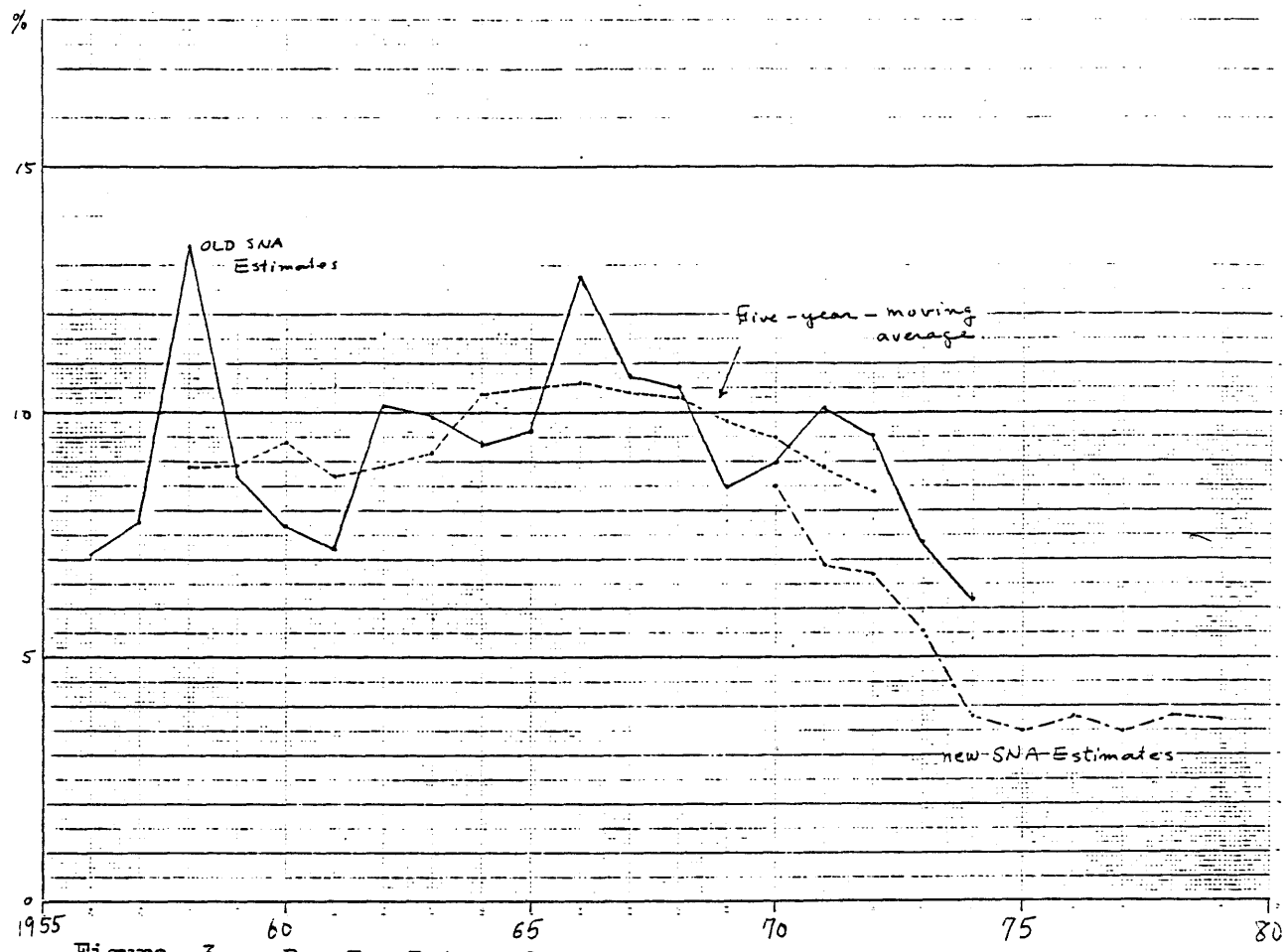


Figure 3 Pre-Tax Rates of Return on Capital

For Manufacturing Sector

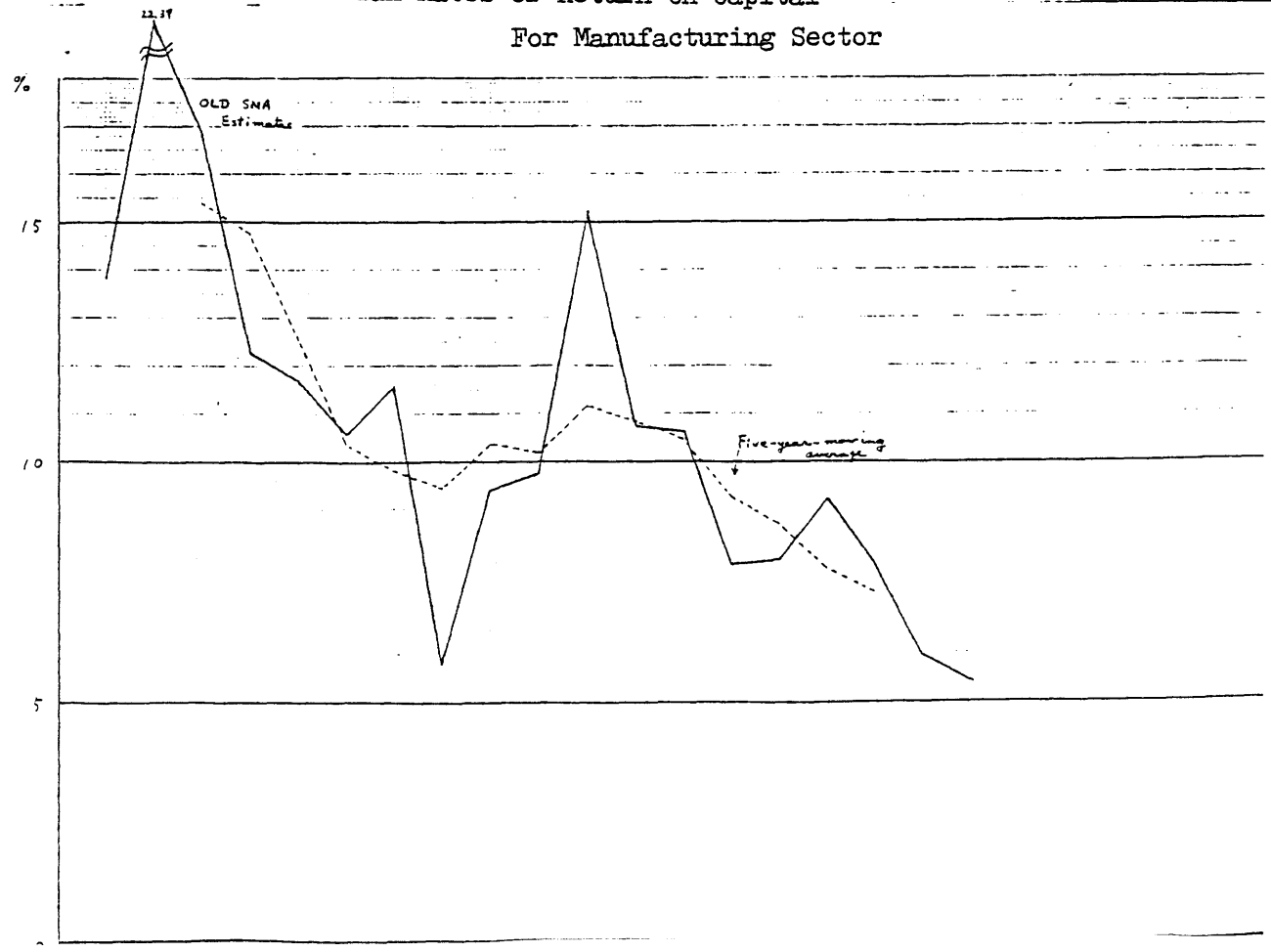


Figure 4 Increase Rates of Price Indexes

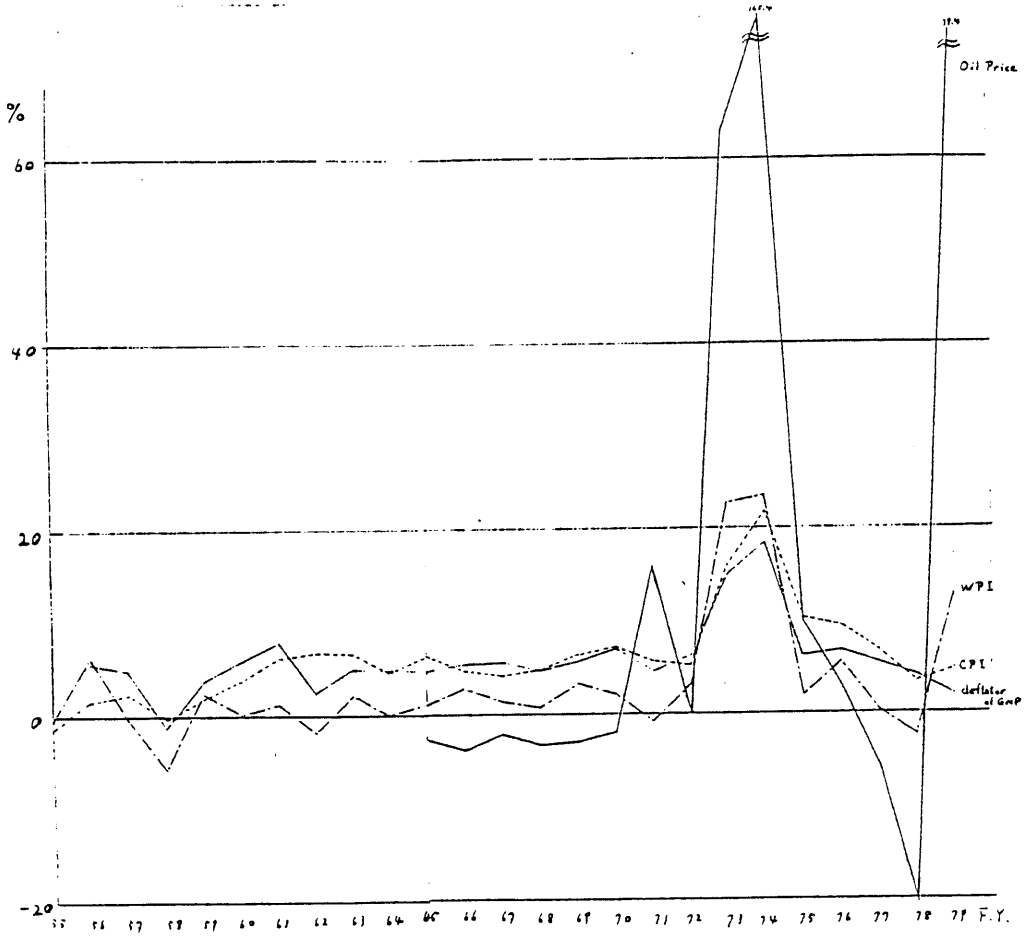


Figure 5 Increase Rates of Wage

real rate is adjusted by WPI

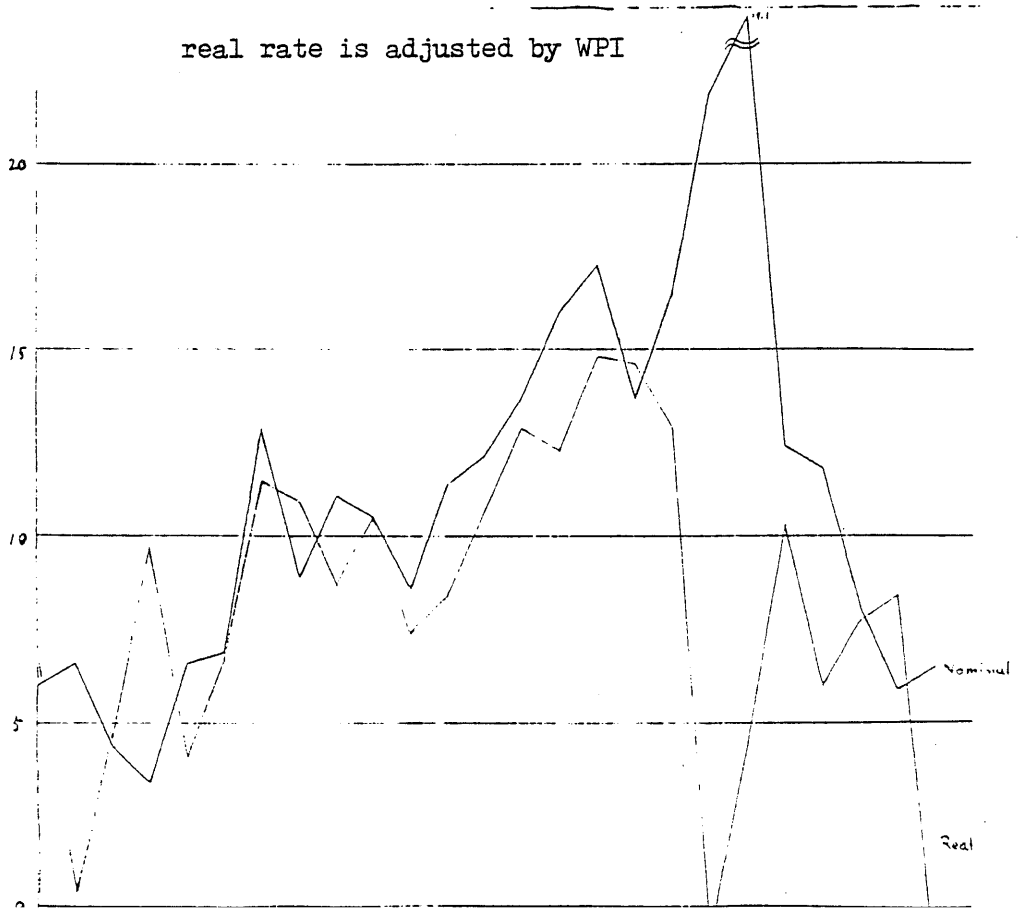


Figure 6 Change of Deflator of Land holding by Corporate Sector

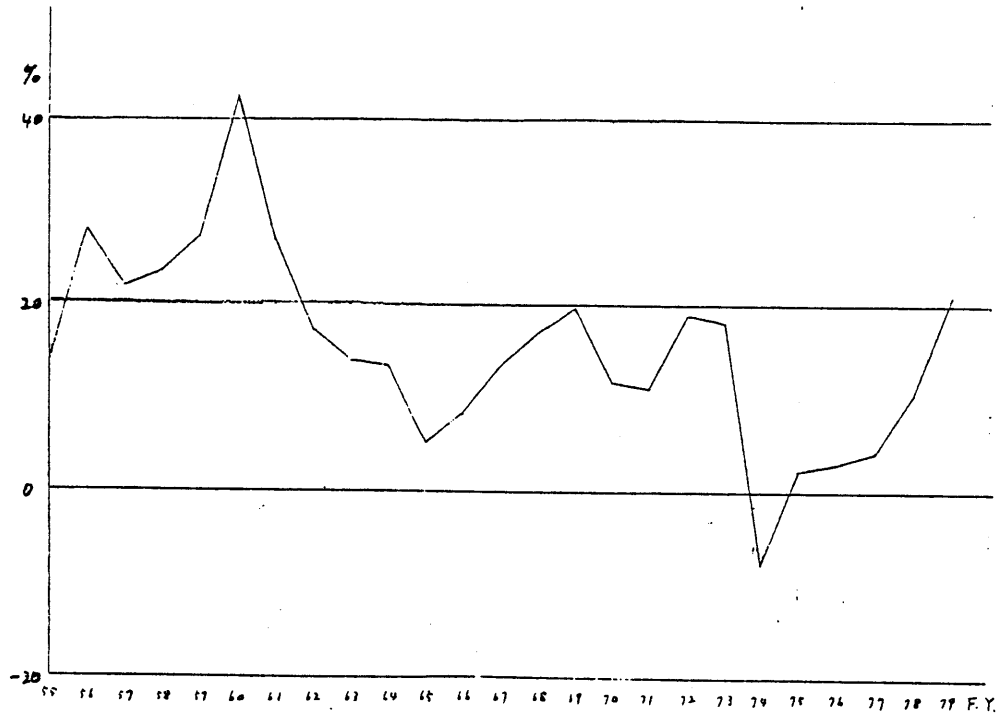


Figure 7-1 Rates of Return on Capital

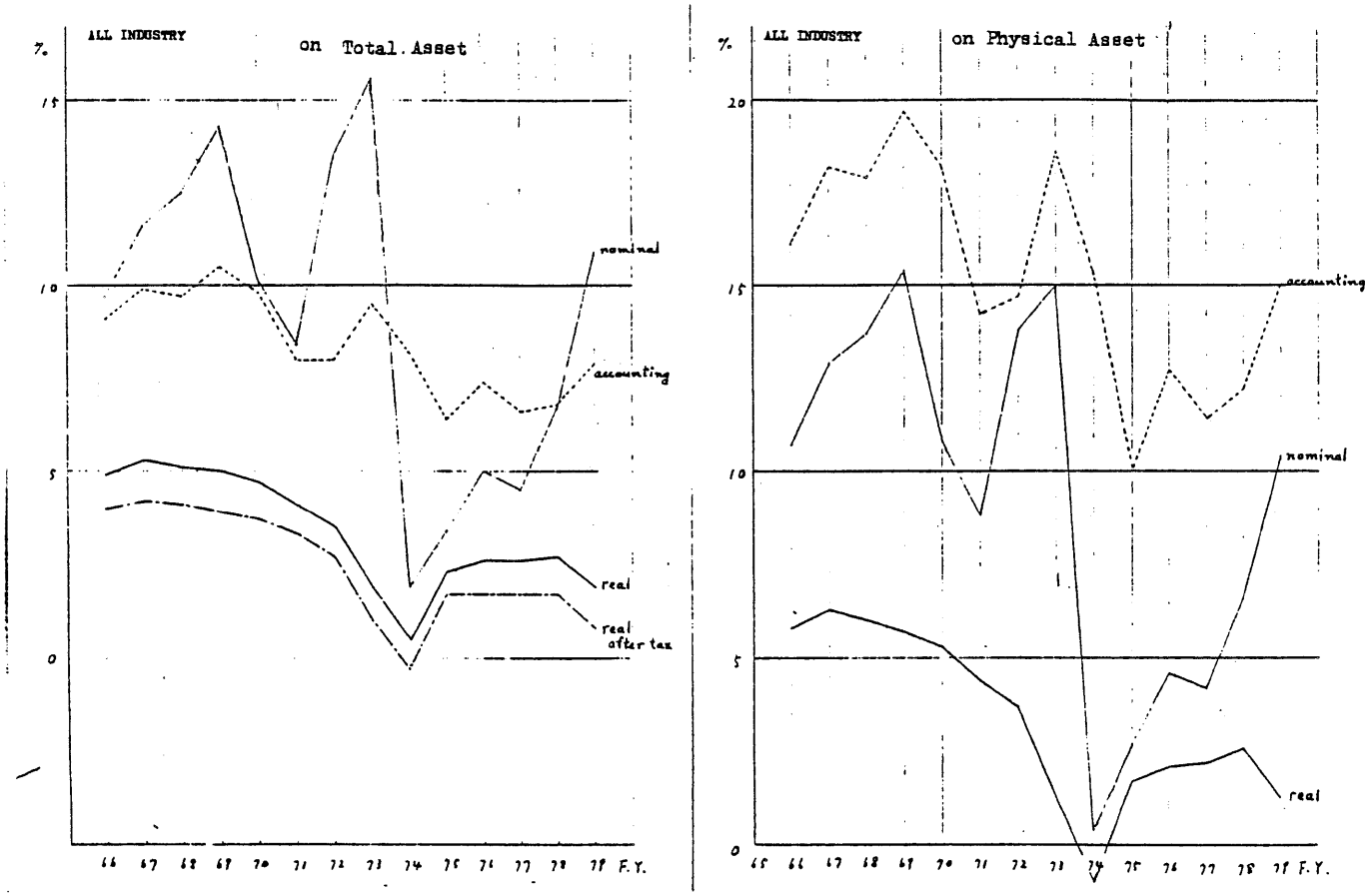


Figure 7-2 Rates of Return on Capital

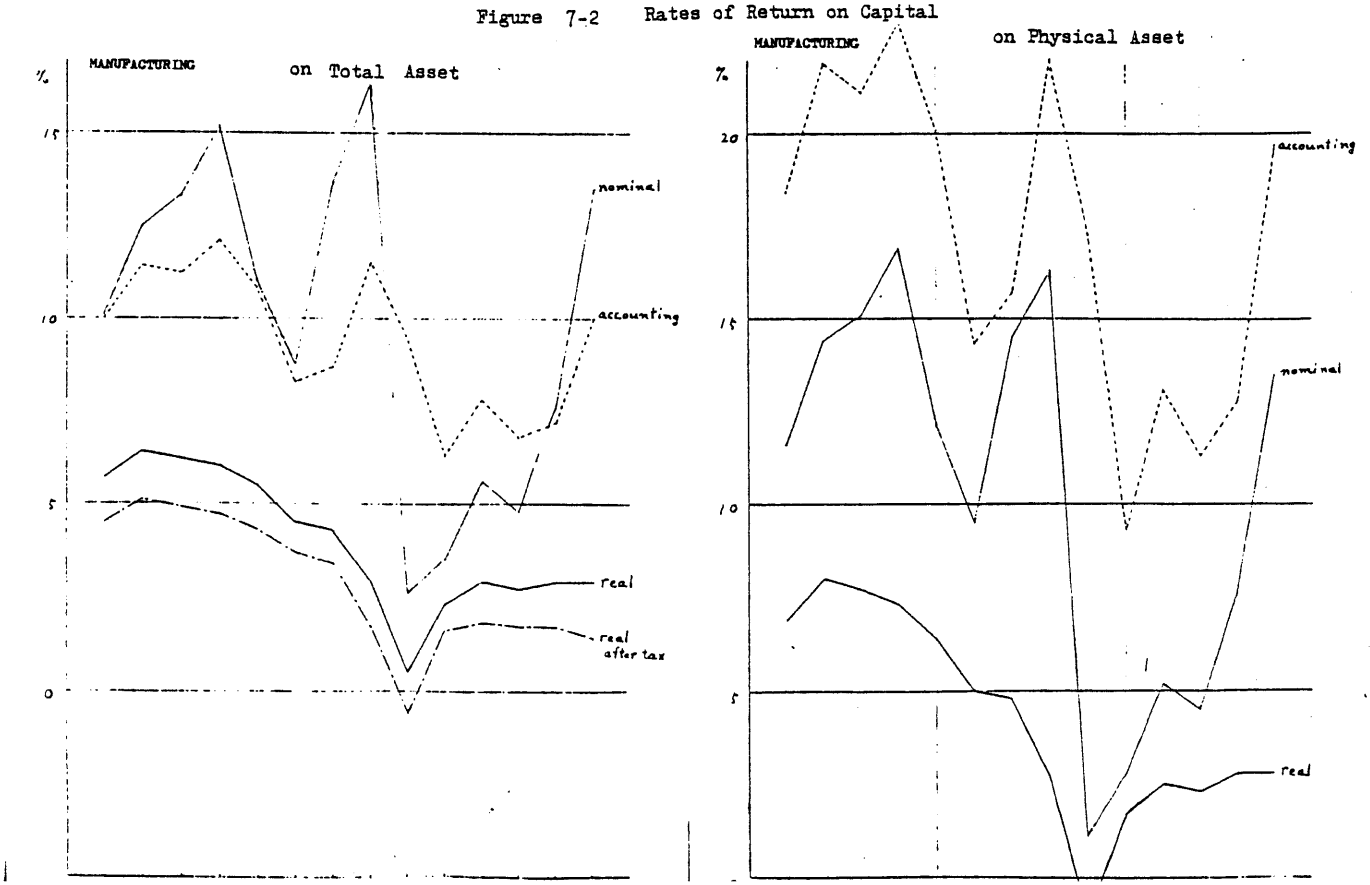


Figure 8 Tax Rates and Equity-to Total Capital Return Ratio

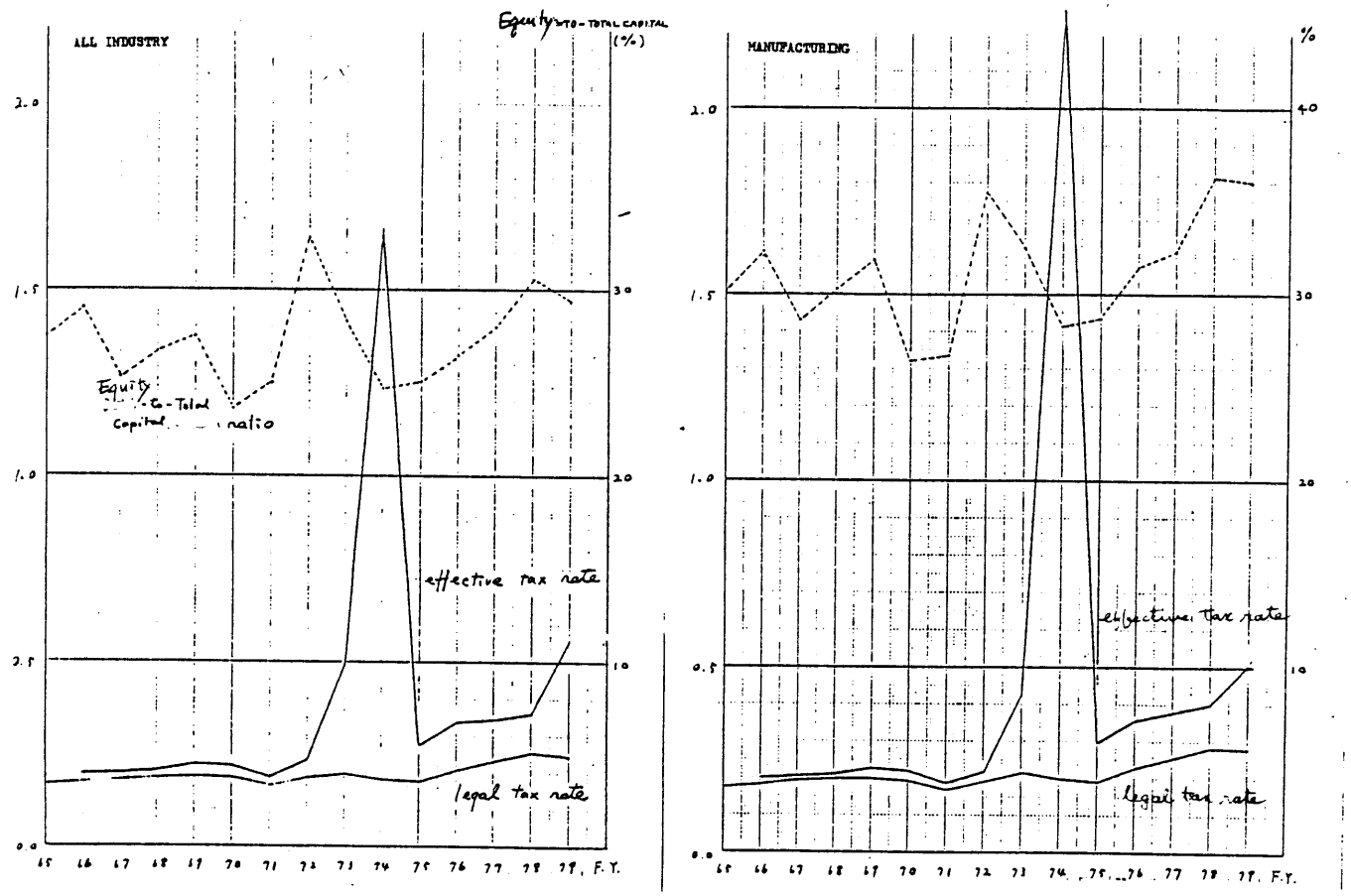
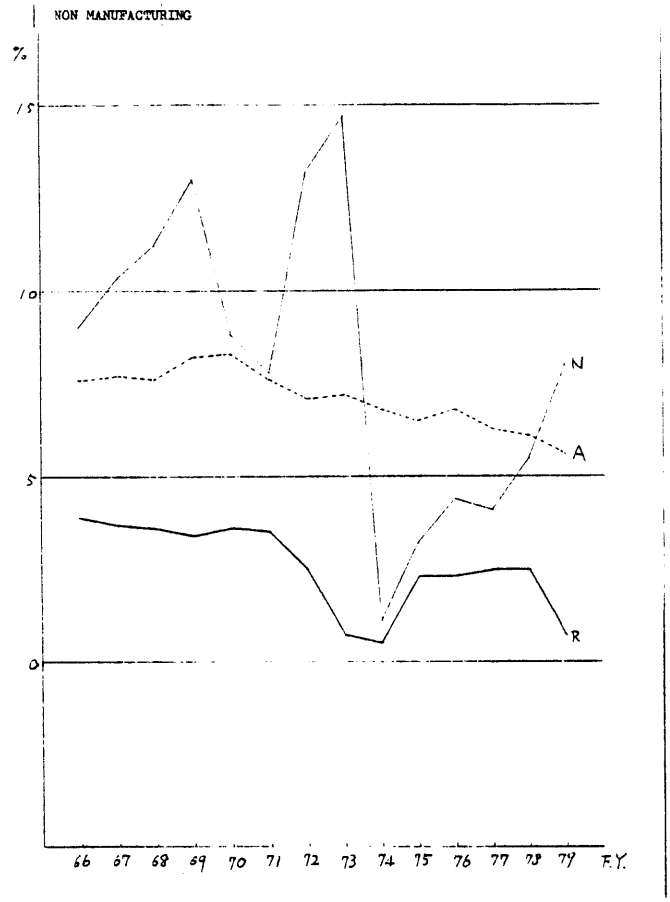
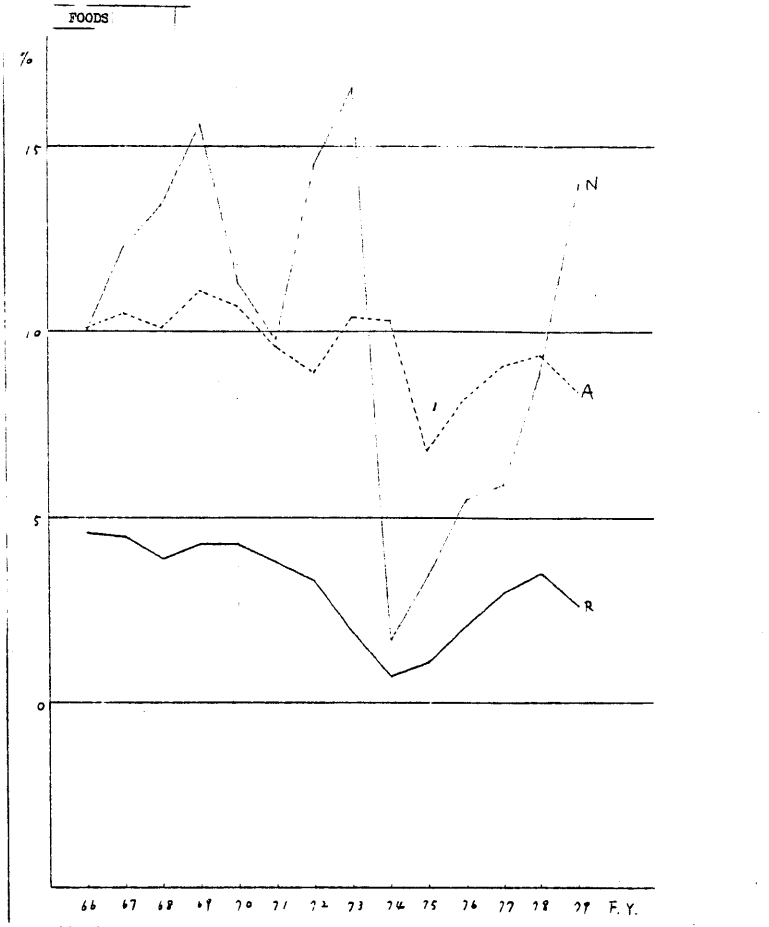
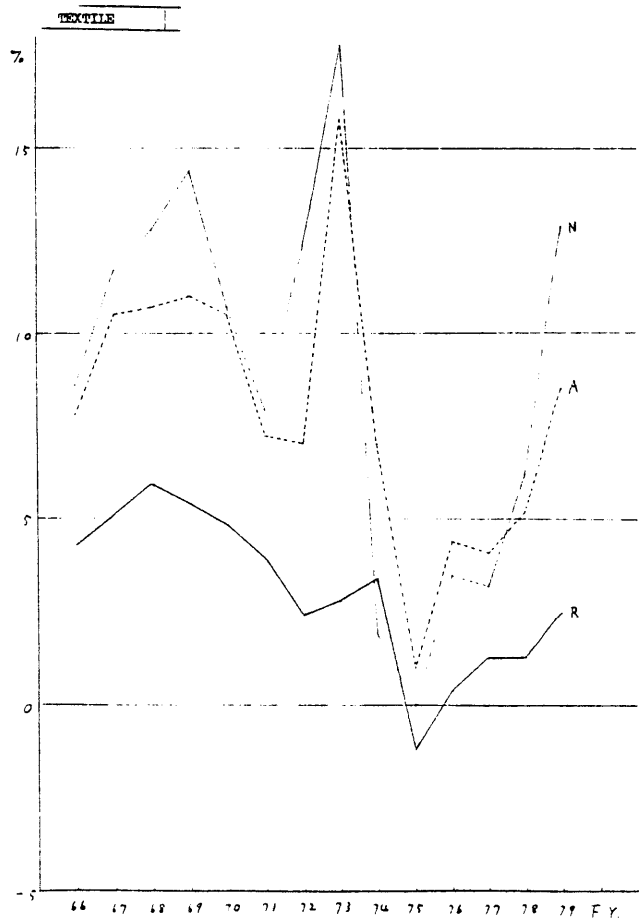


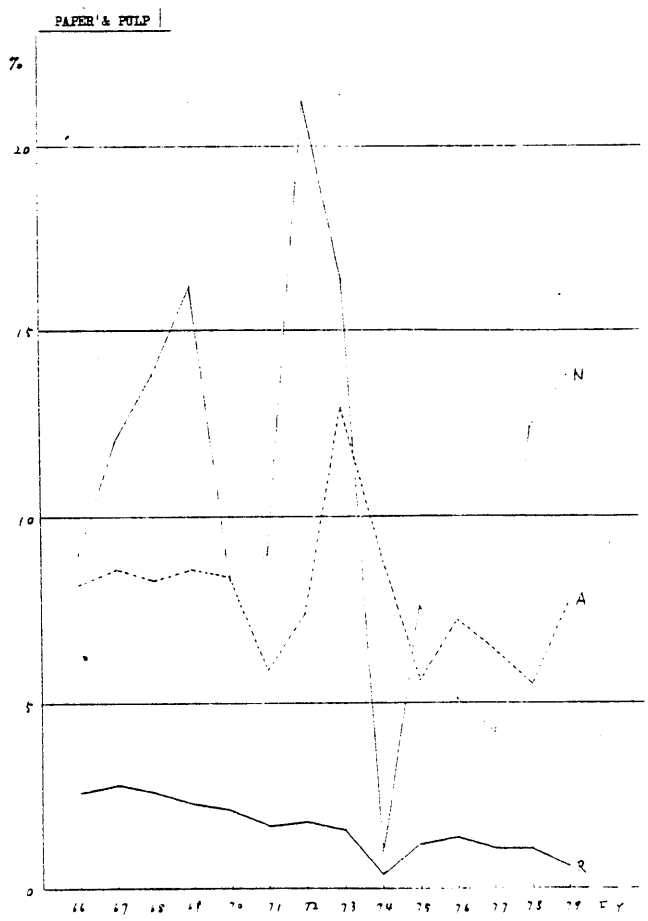
Figure 7-3 Rates of Return on Capital

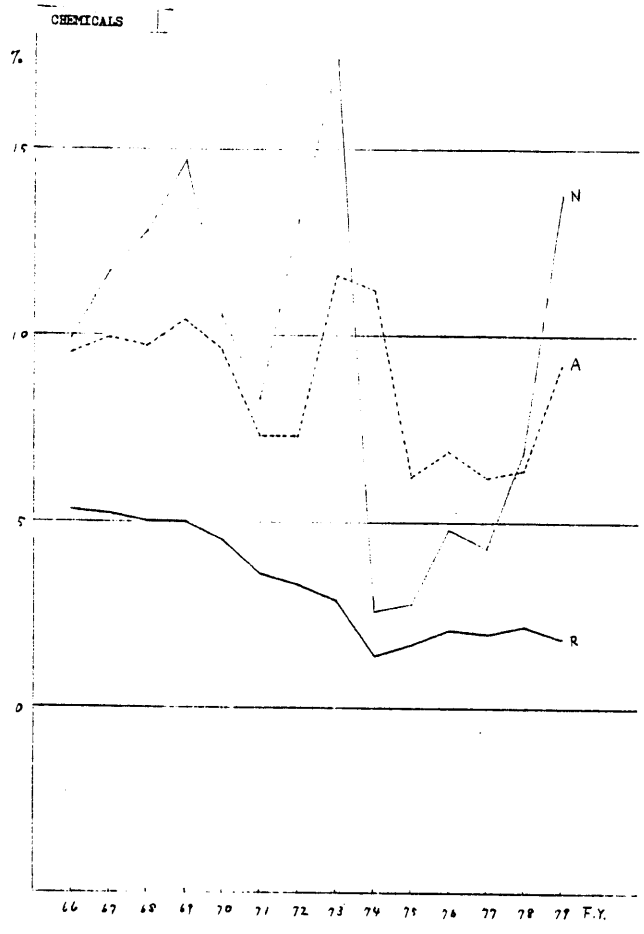
R=real N=nominal A=accounting



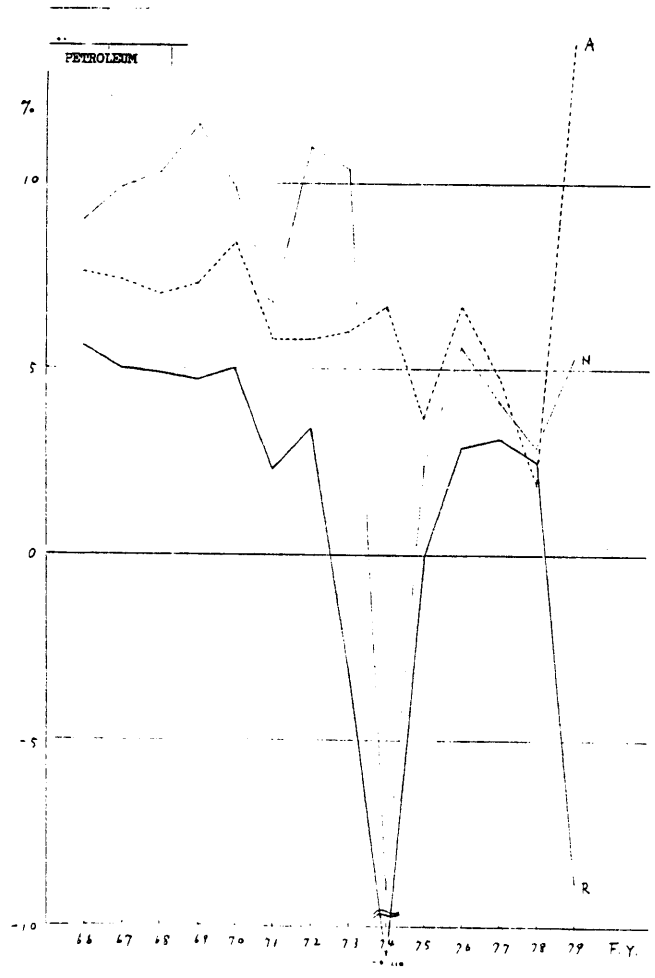


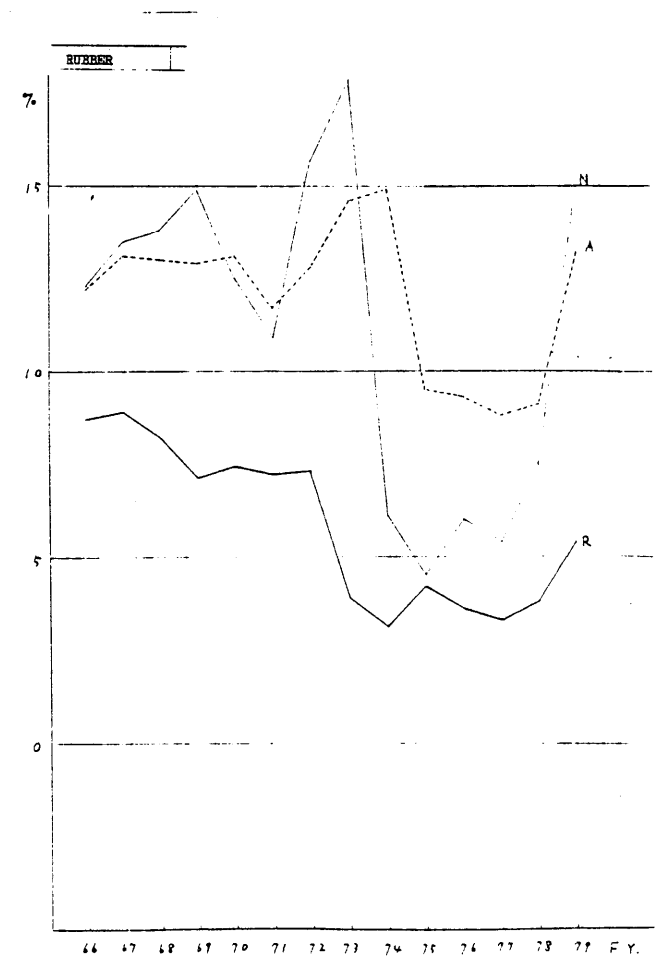


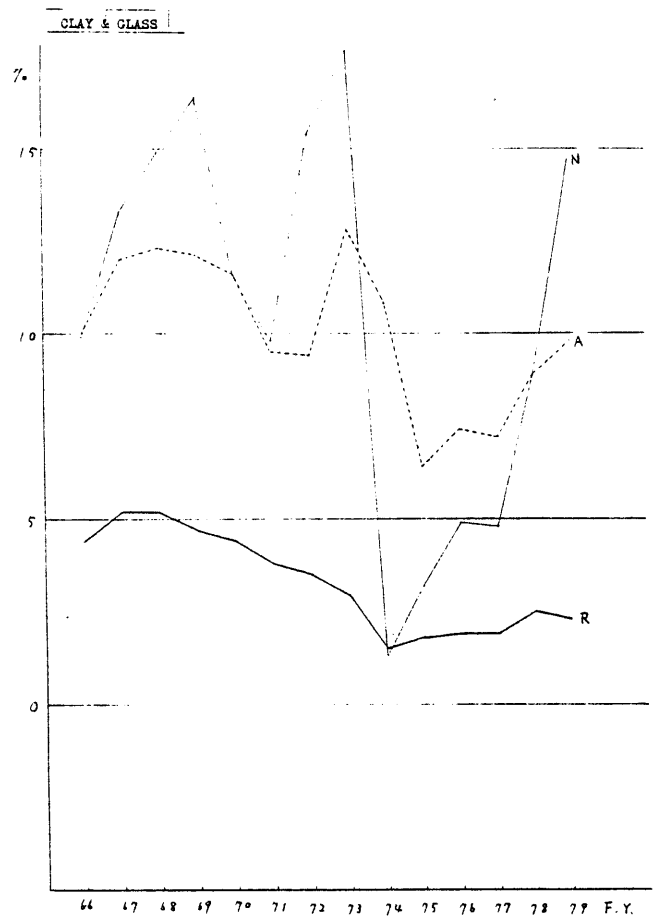


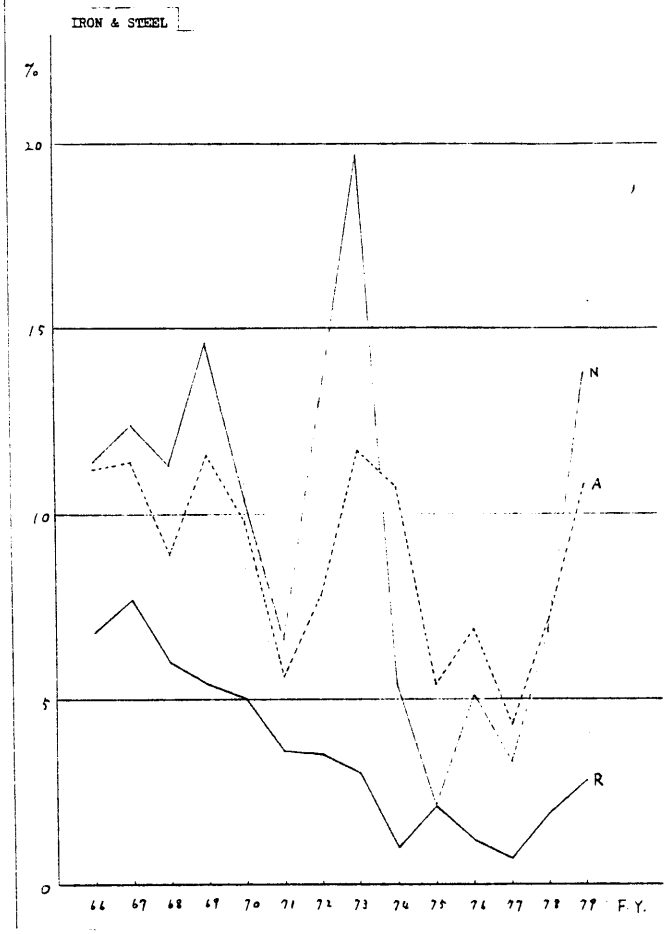

CHEMICALS
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

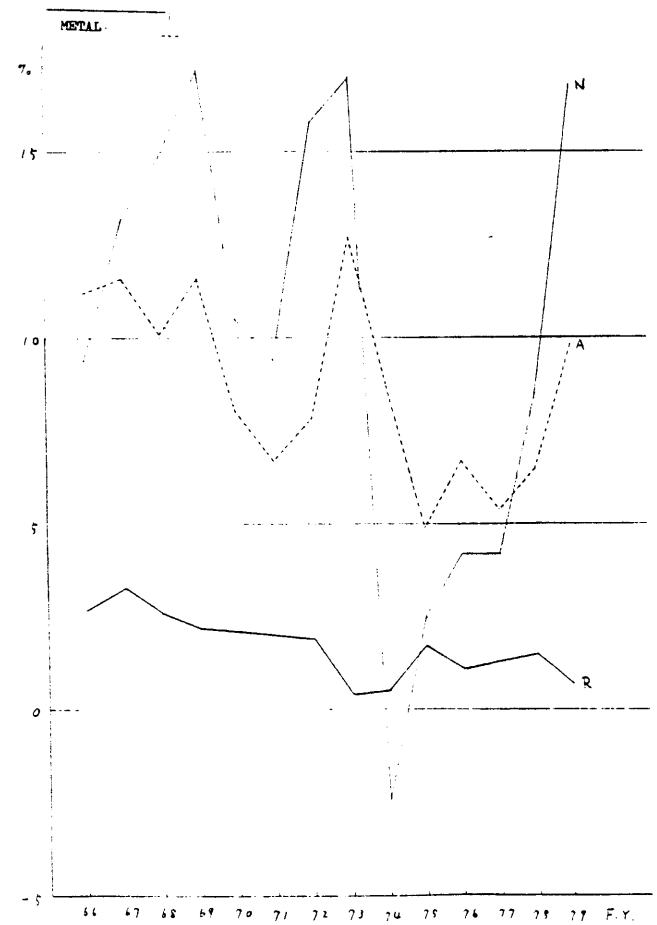

DRUGS
%
20
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

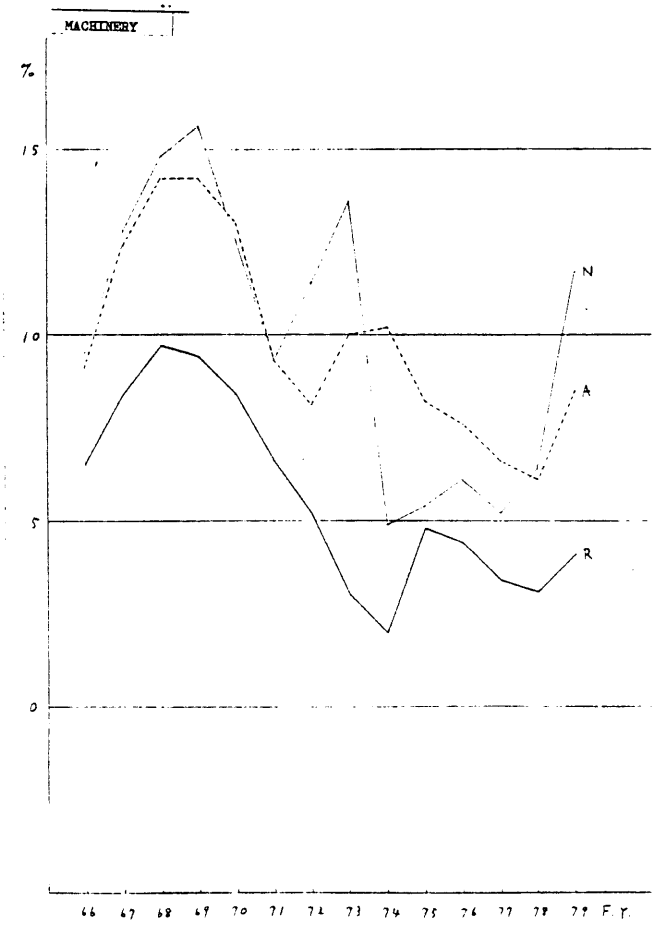

PETROLEUM
%
10
5
0
-5
-10
A
N
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

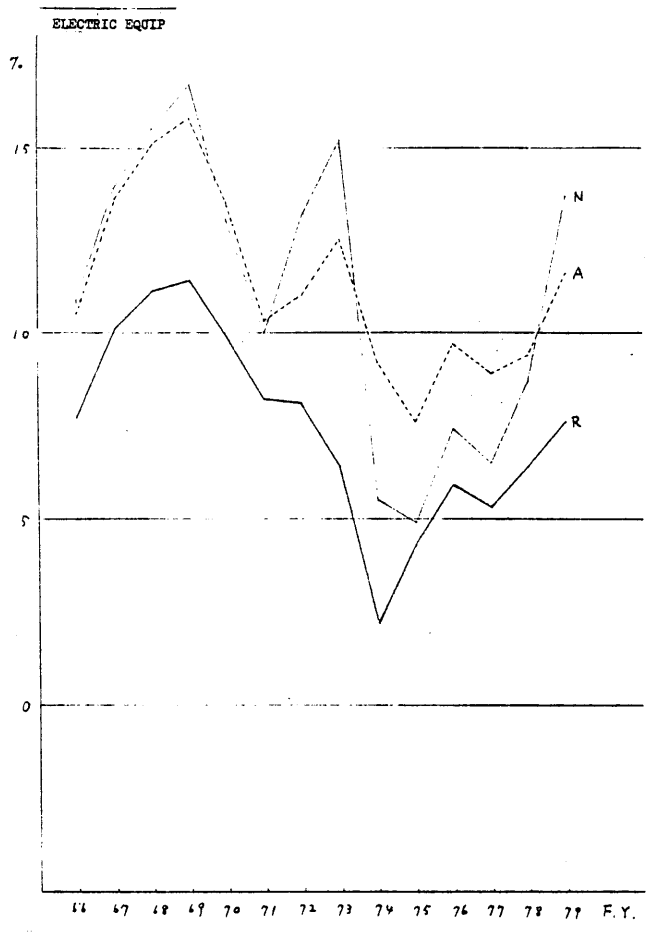

RUBBER
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

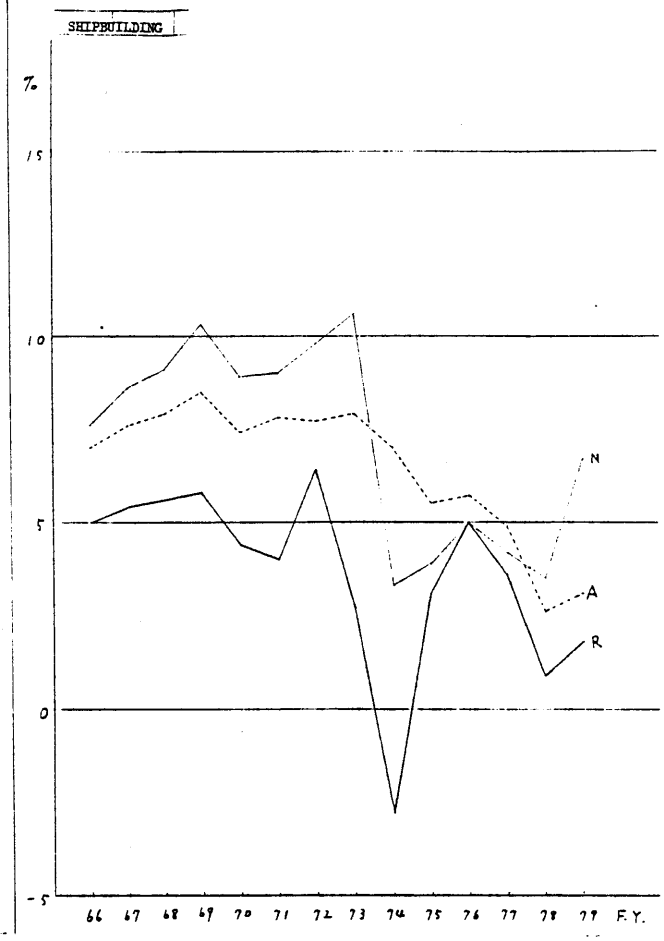

CLAY & GLASS
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

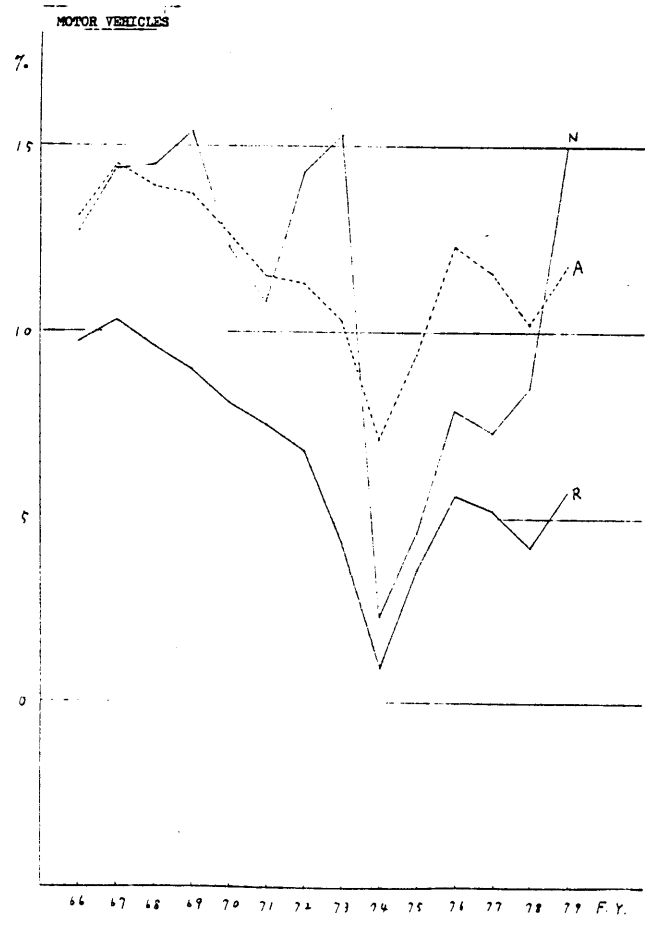

IRON & STEEL
%
20
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

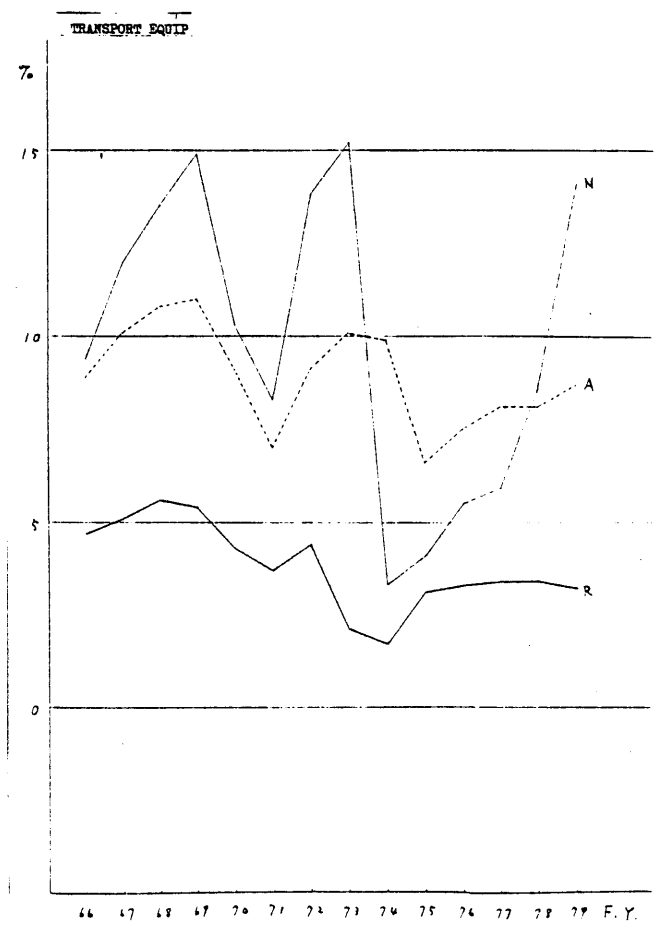

METAL
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

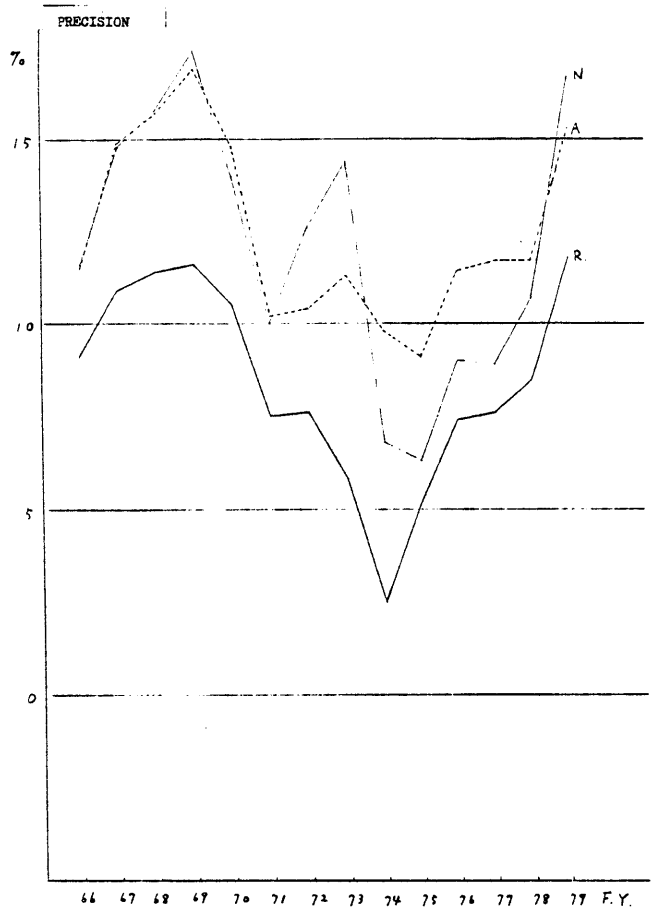

MACHINERY
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

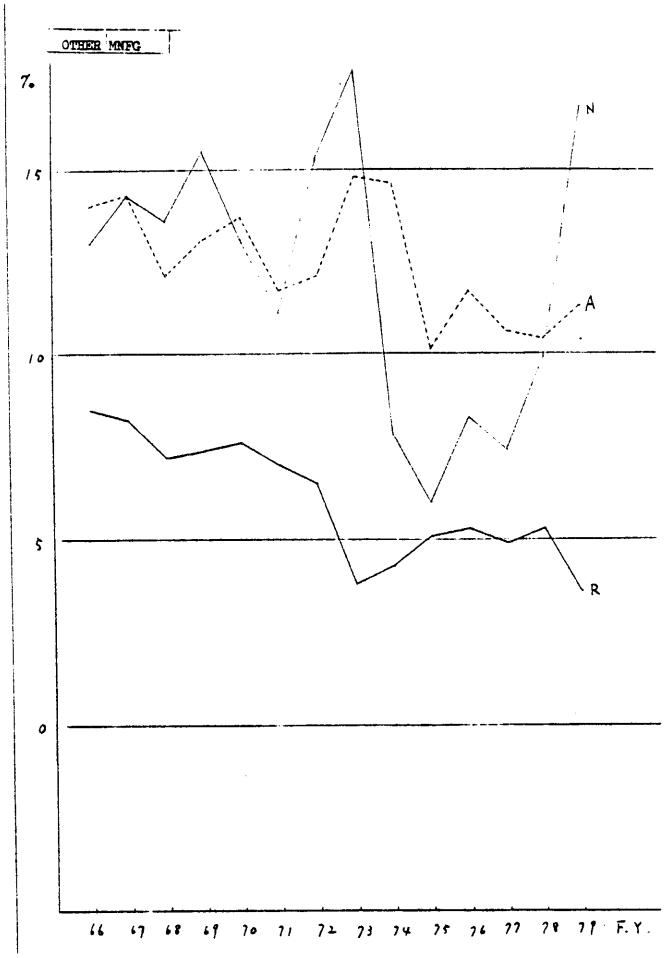

ELECTRIC EQUIP
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

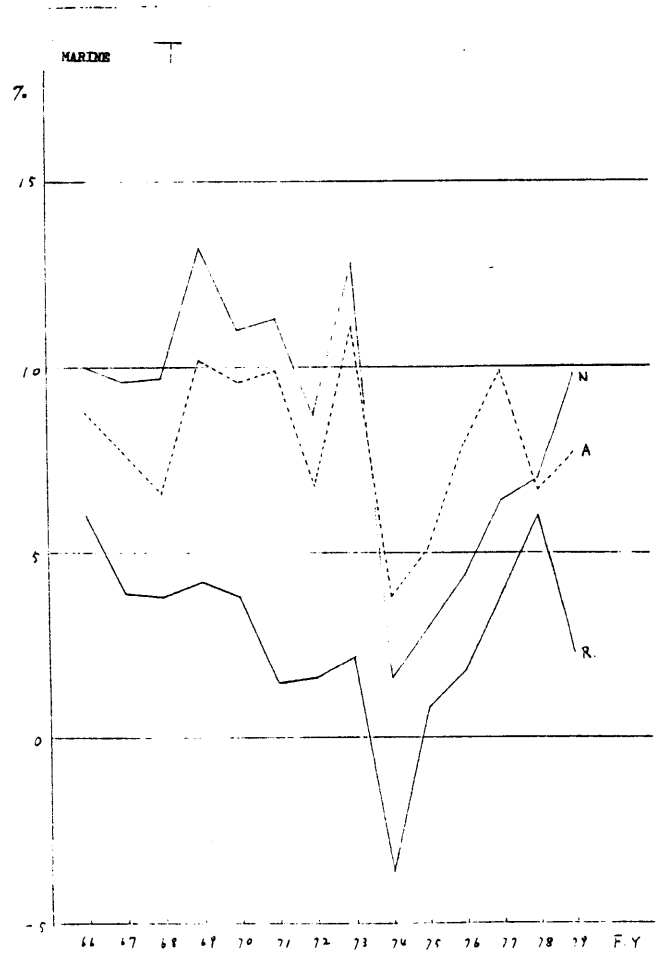

SHIPBUILDING
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

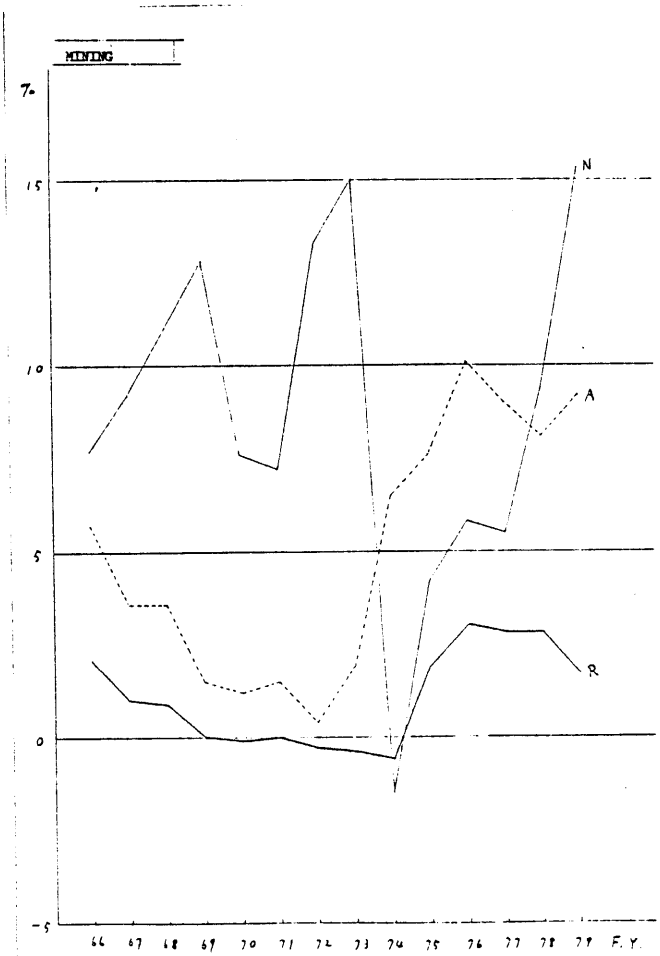

MOTOR VEHICLES
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

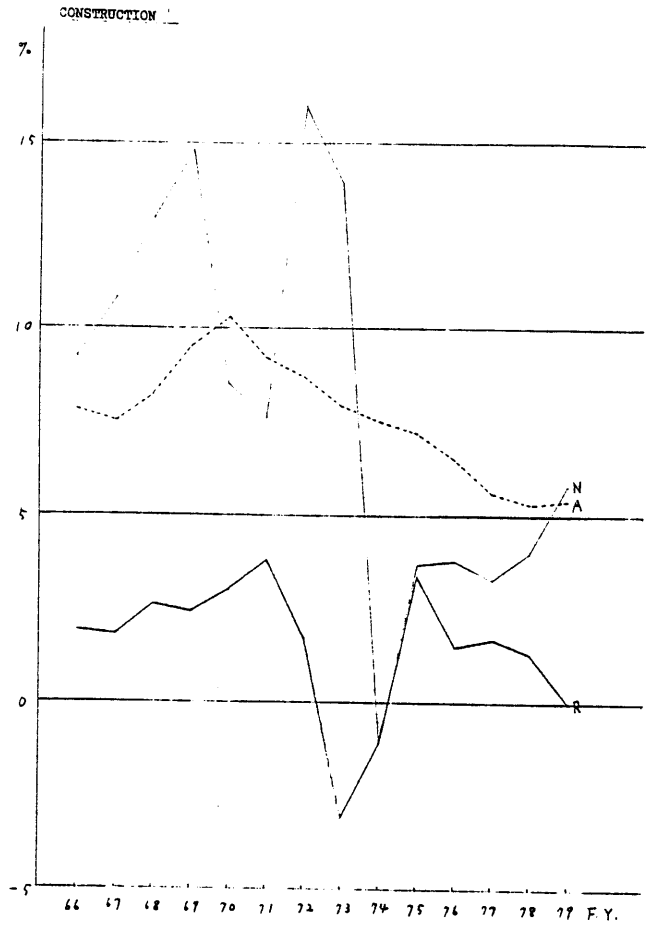

TRANSPORT EQUIP
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

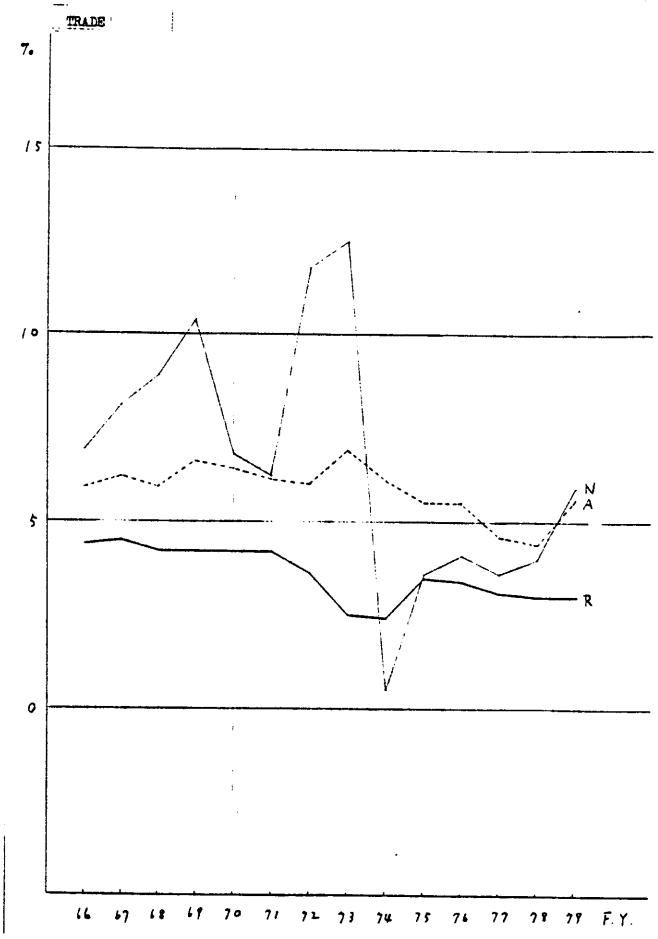

PRECISION
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

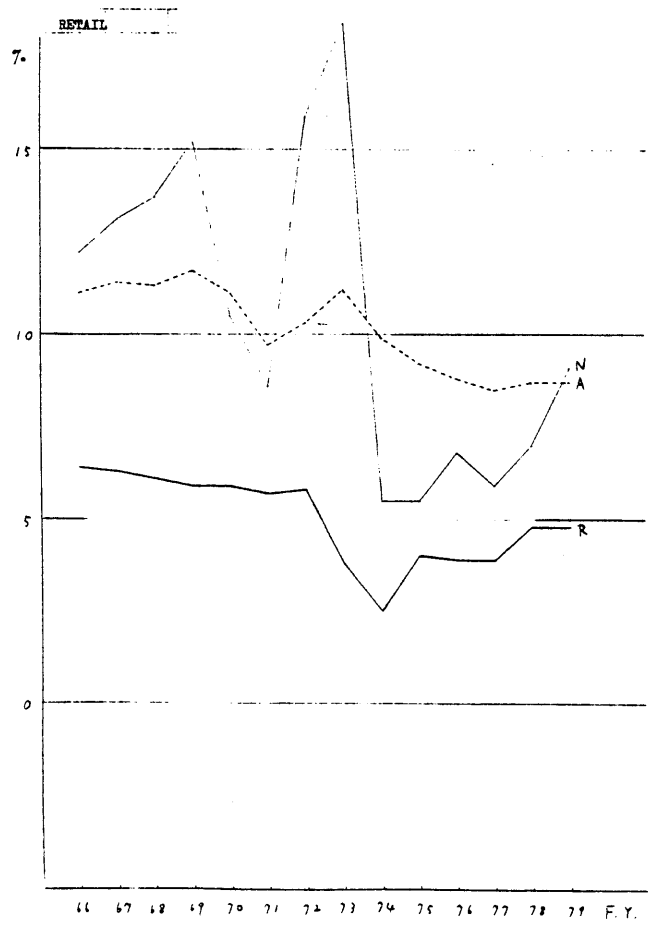

OTHER MNFG
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

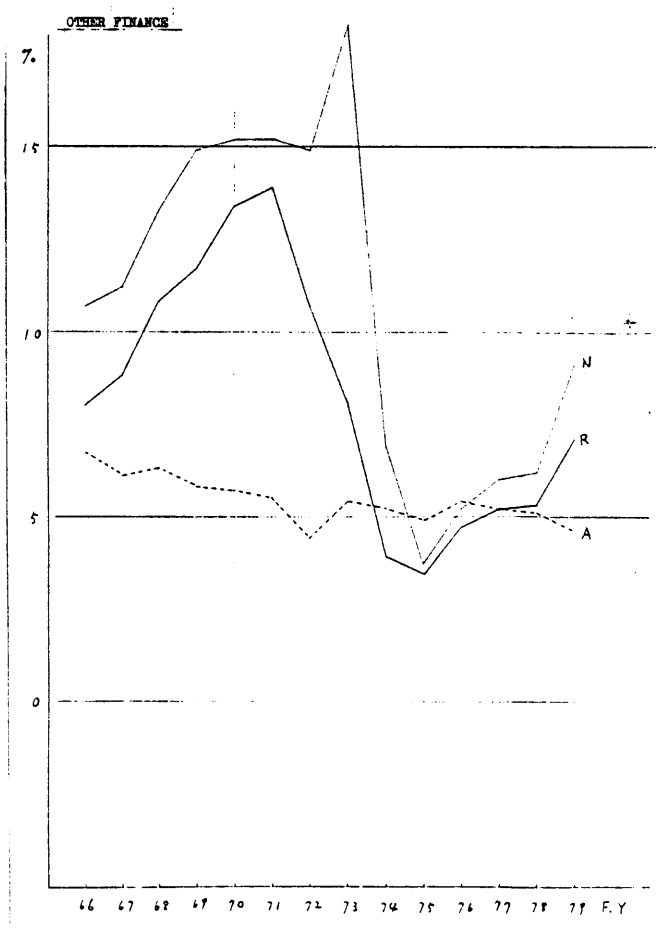

MARINE
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

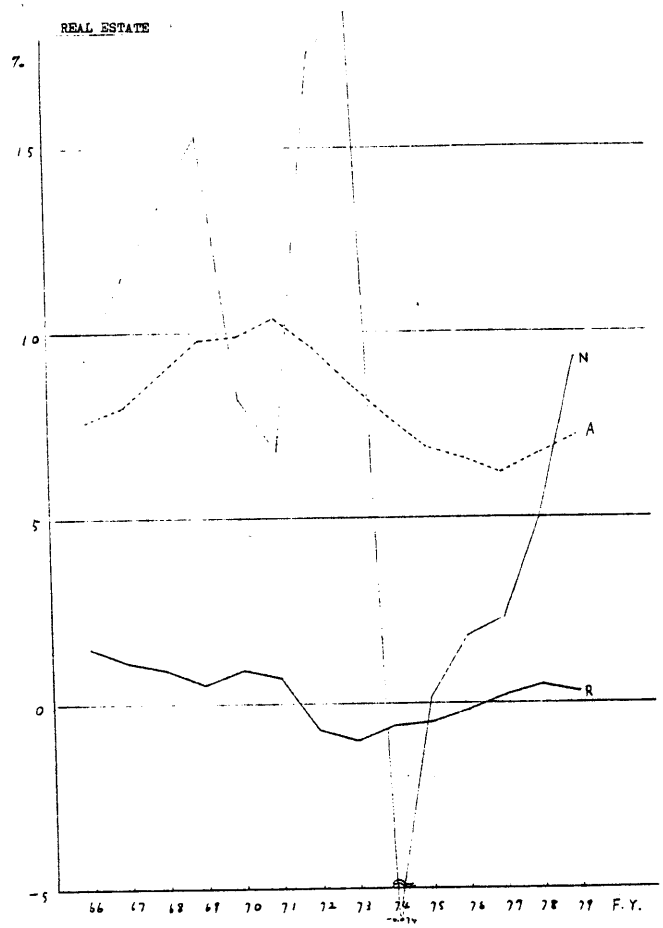

MINING
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

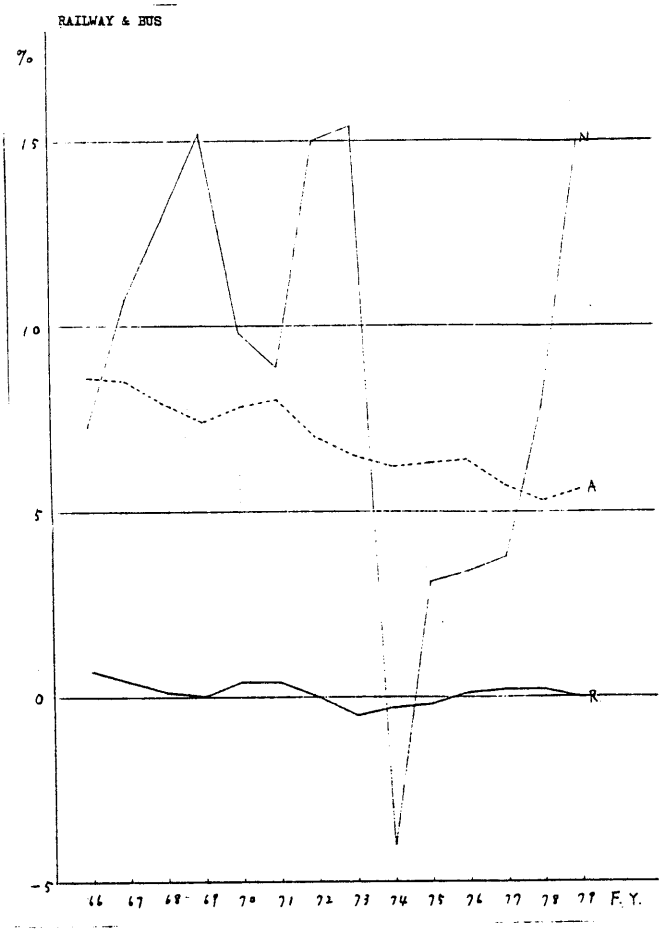

CONSTRUCTION
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

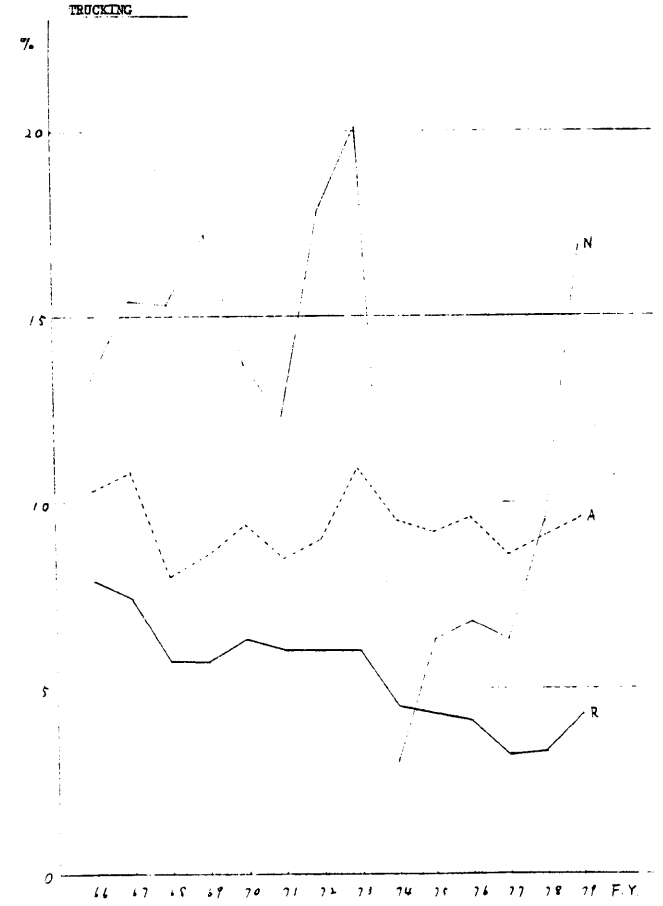

TRADE
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

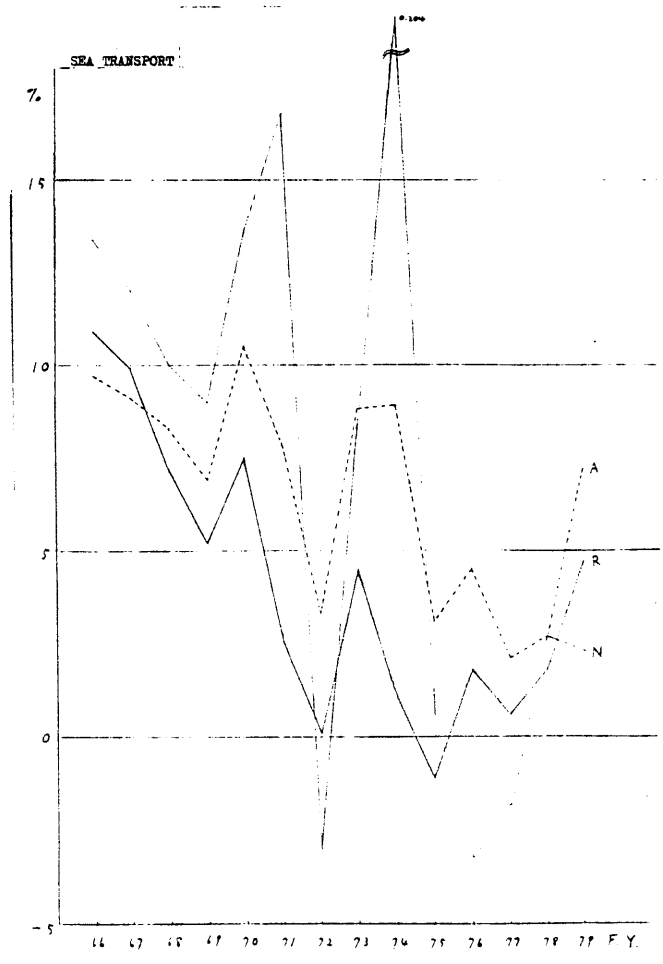

RETAIL
%
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

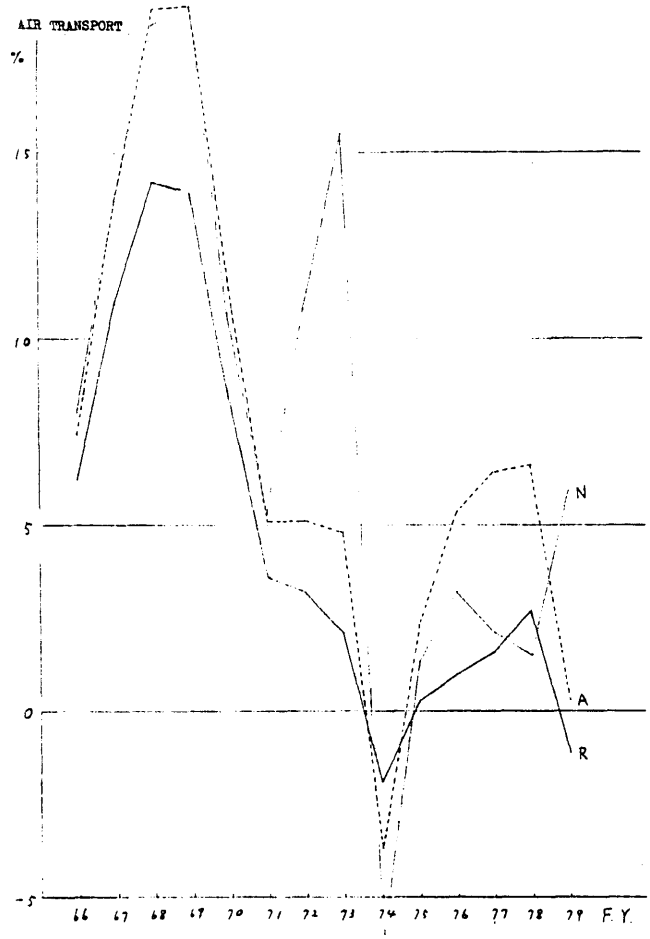

OTHER FINANCE
%
15
10
5
0
N
R
A
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y

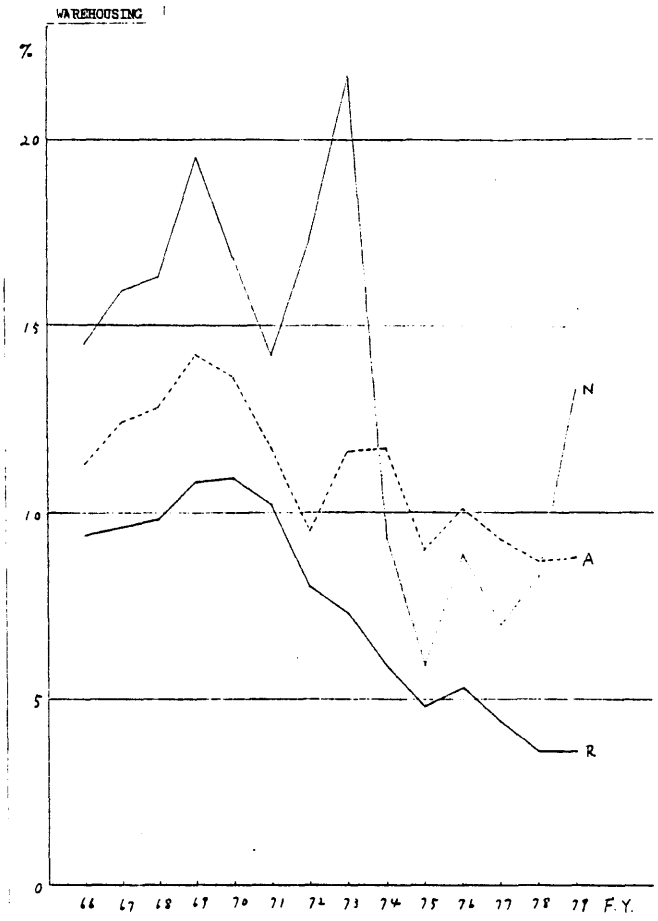

REAL ESTATE
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

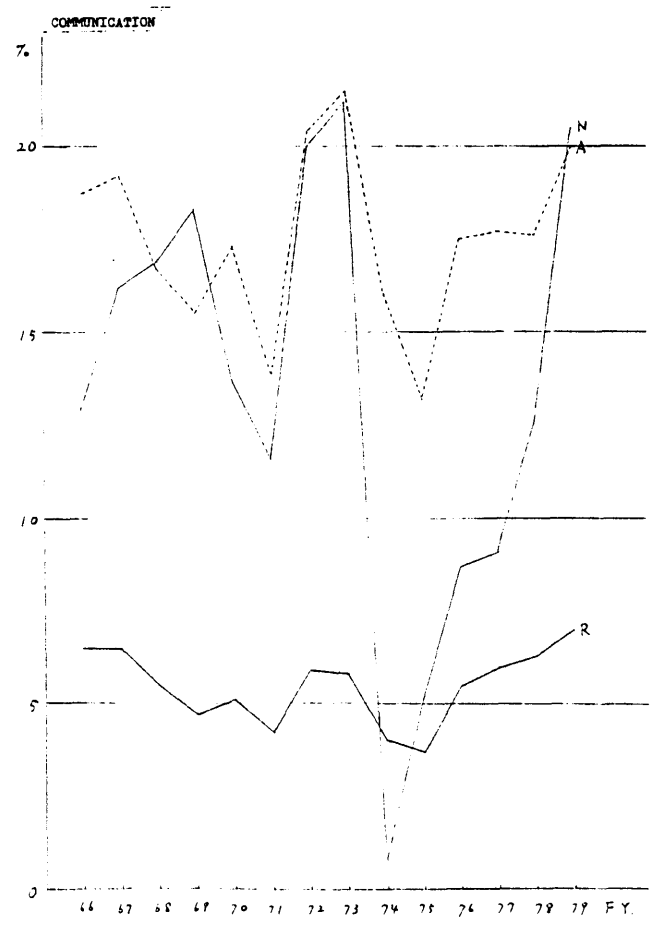

RAILWAY & BUS
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

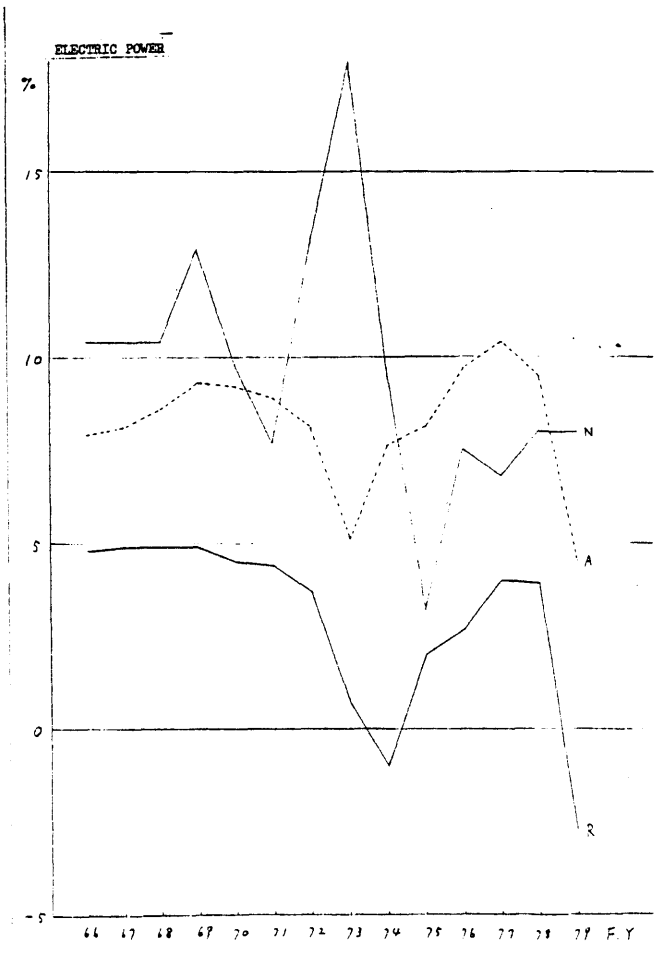

TRUCKING
%
20
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

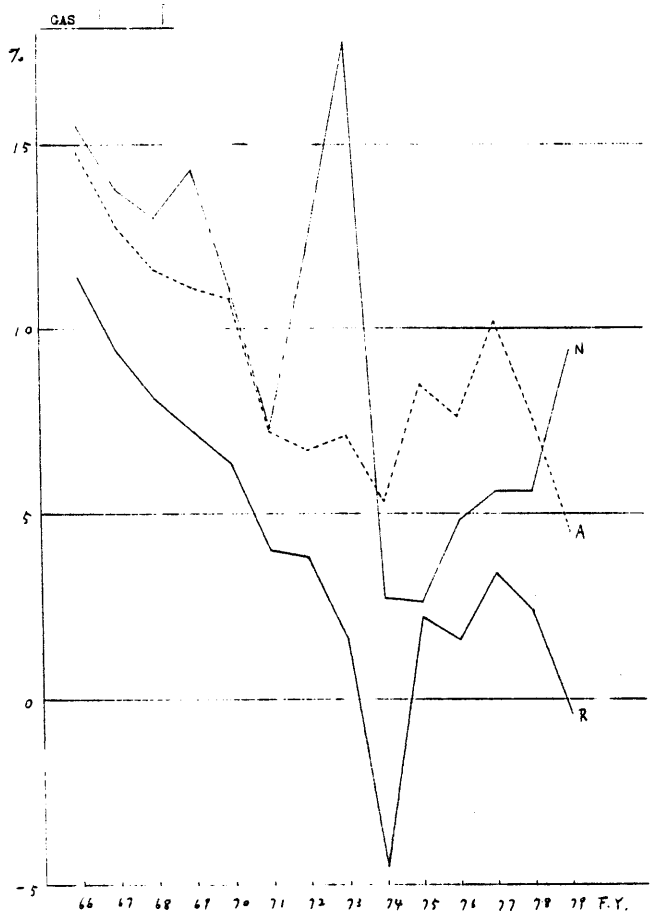

SEA TRANSPORT
%
15
10
5
0
-5
A
R
N
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.


AIR TRANSPORT
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.


WAREHOUSING
%
20
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.


COMMUNICATION
%
20
15
10
5
0
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.


ELECTRIC POWER
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.


GAS
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

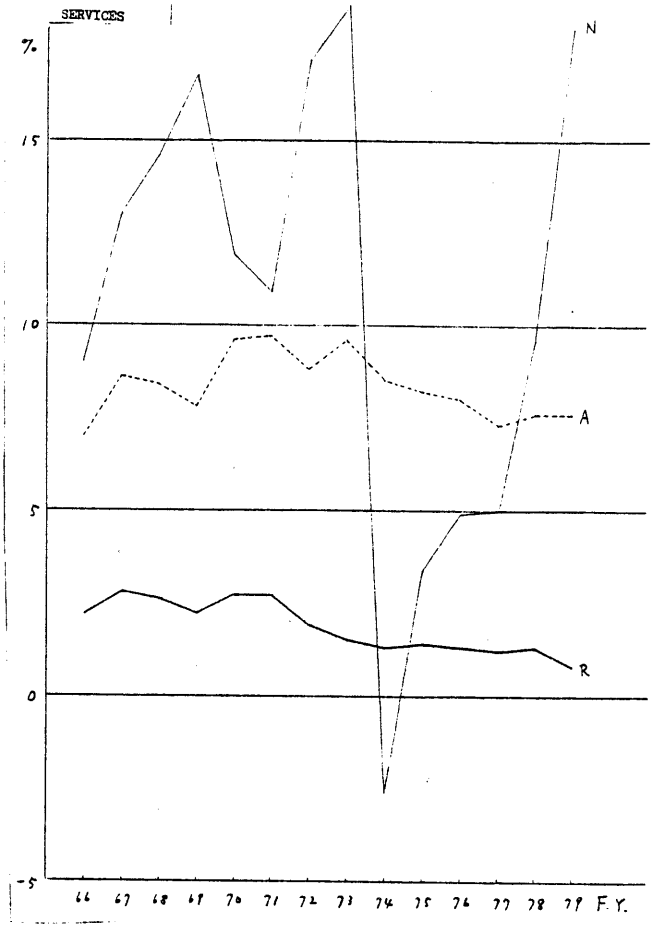

SERVICES
%
15
10
5
0
-5
N
A
R
66 67 68 69 70 71 72 73 74 75 76 77 78 79 F.Y.

Figure 9 Regression Line for Effective Tax Rates against Equity Ratios based upon Market Prices

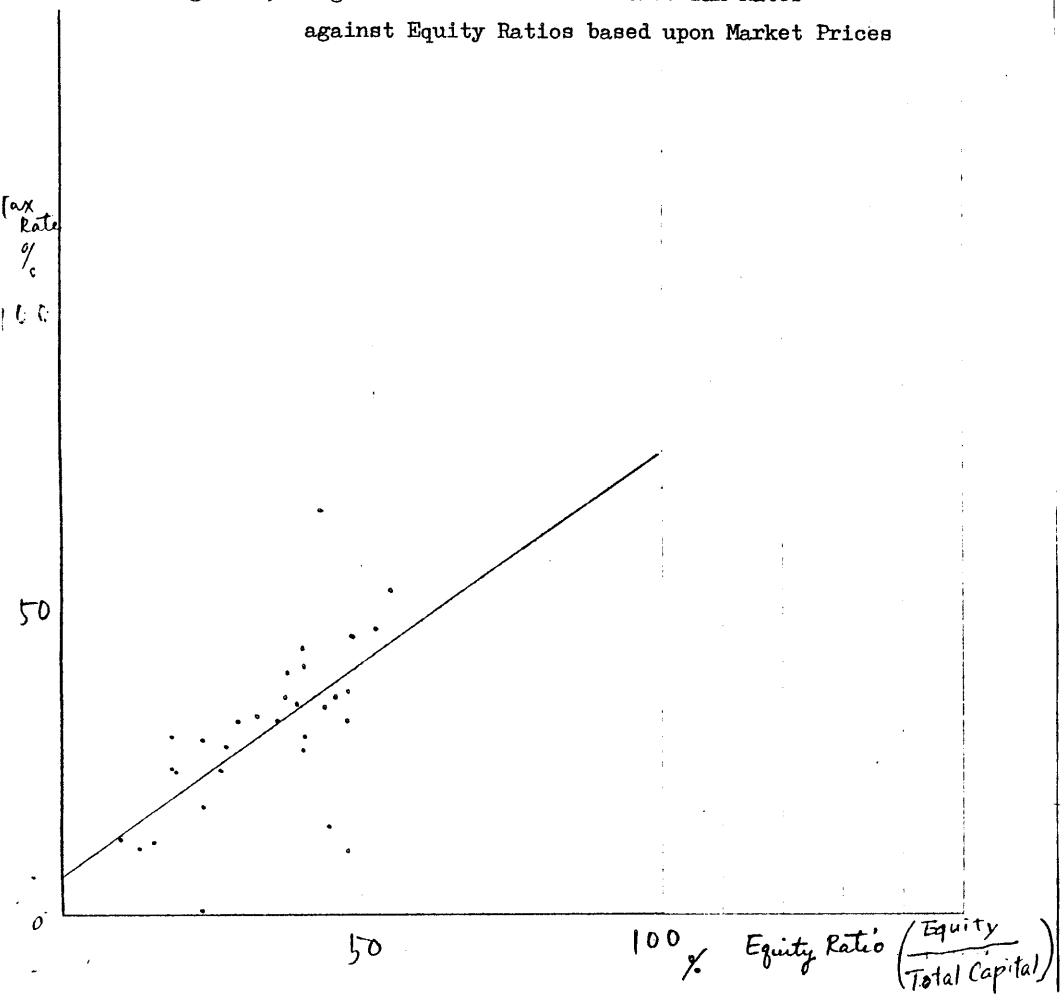


Figure 10 Revaluation Ratio ALL INDUSTRY

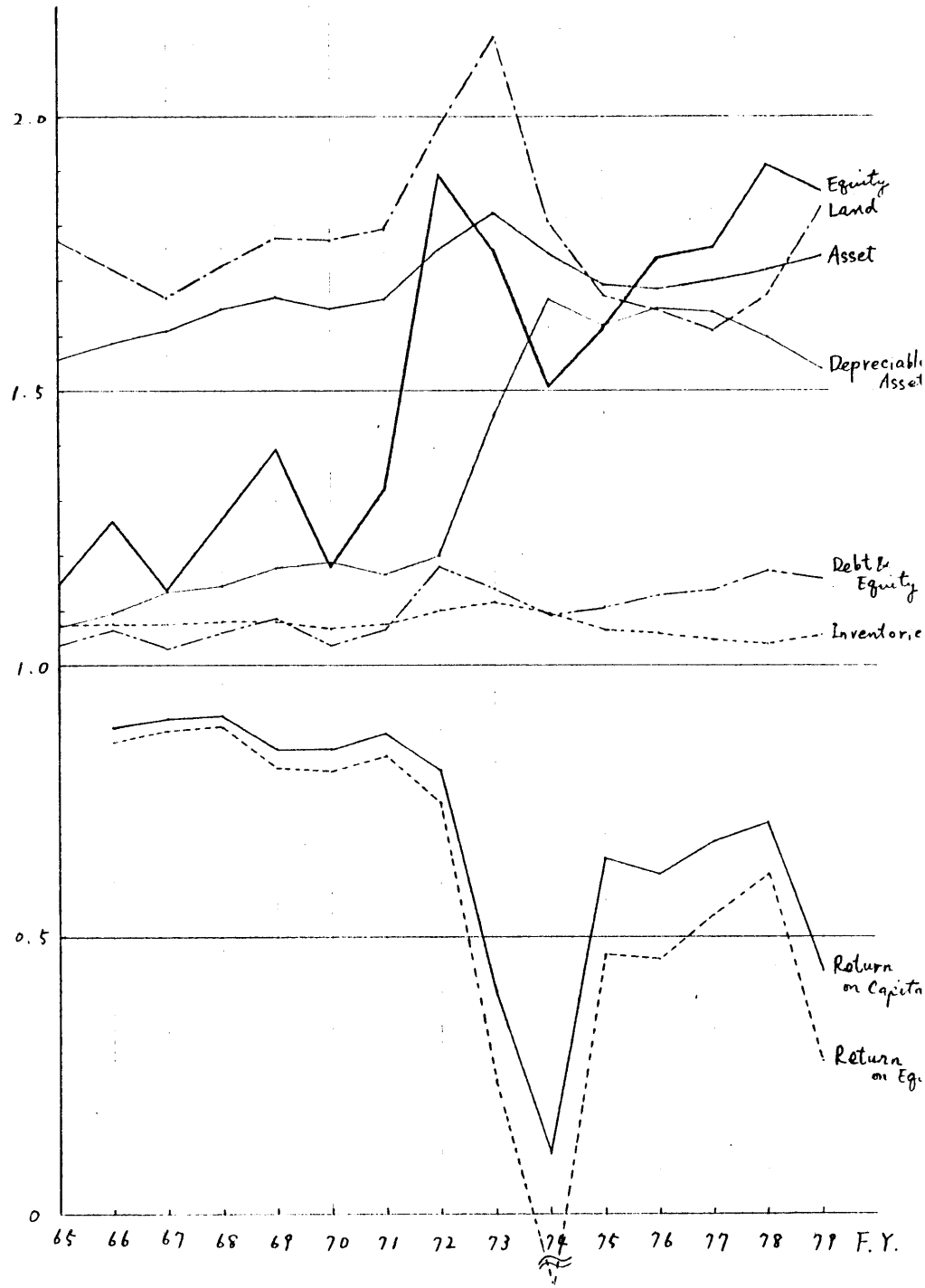


Figure 11 Average Age-life of Depreciable Asset and Average Inventory Period

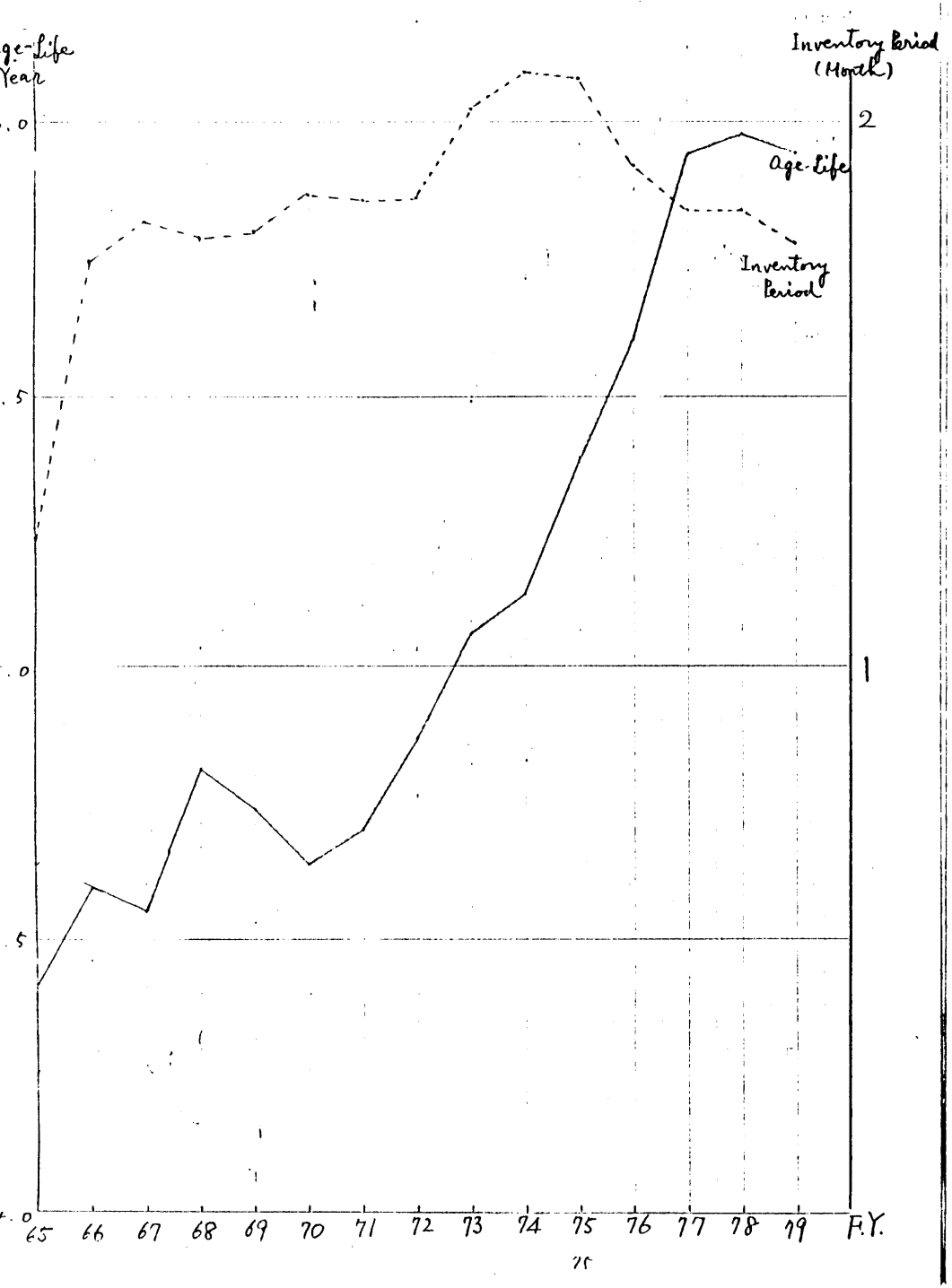


Figure 12 Deflater of Capital Asset on All Inustry (Holding Gain Rate)

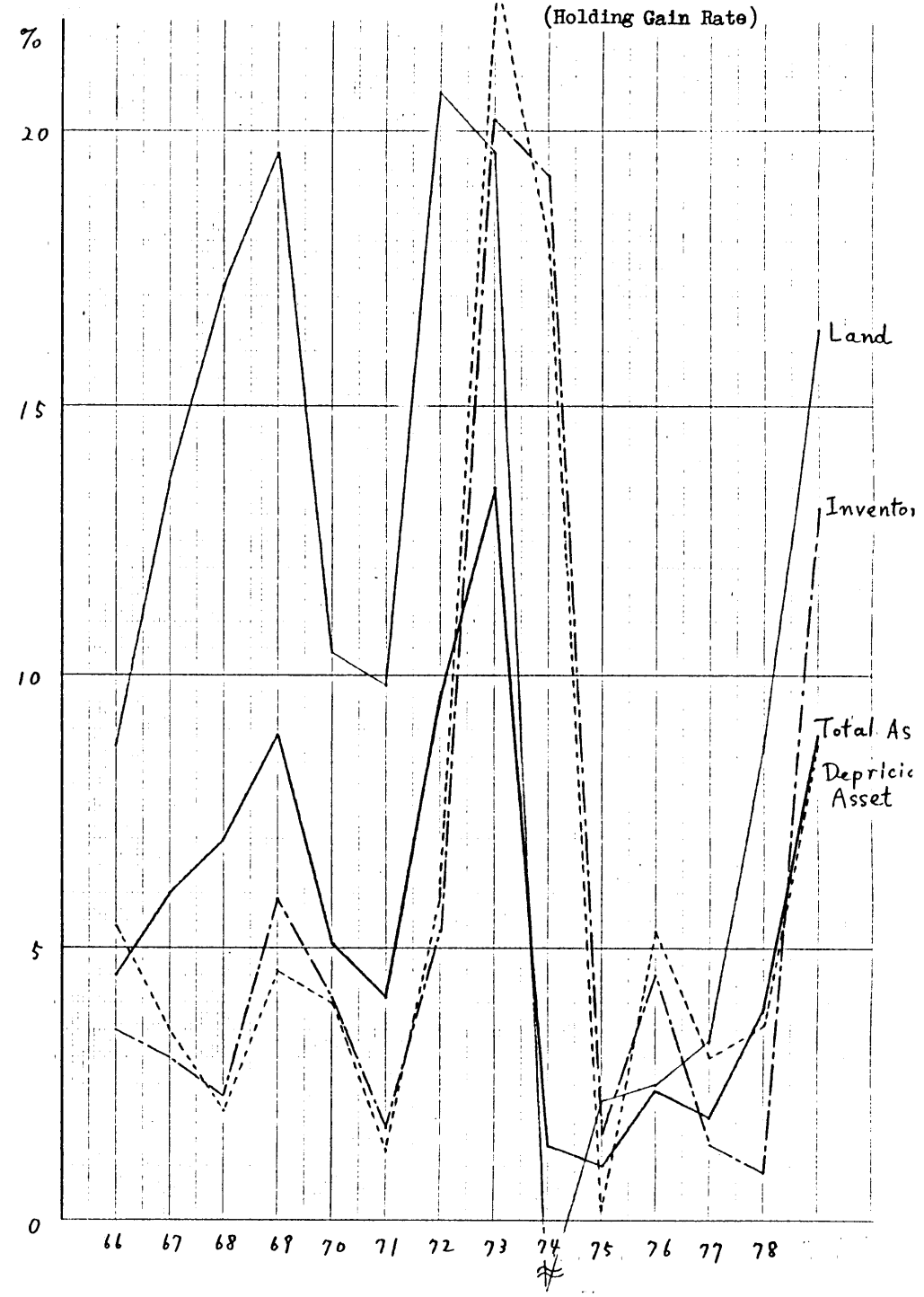


Figure 13 Risk-Return Relationship on Real Rate of Return on Capital(except regulated industriss)

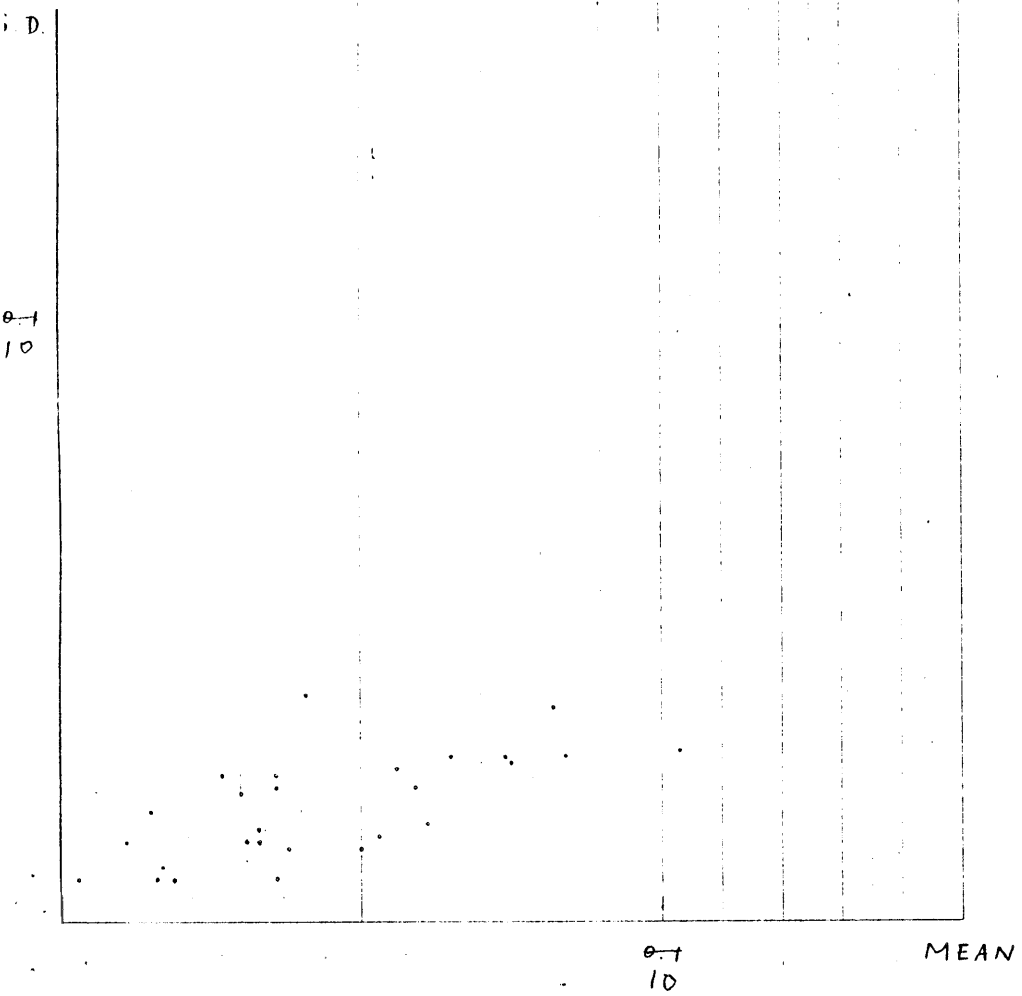


Figure 14 Rates of Return to Investors (RRI) and Rates of Return on Capital

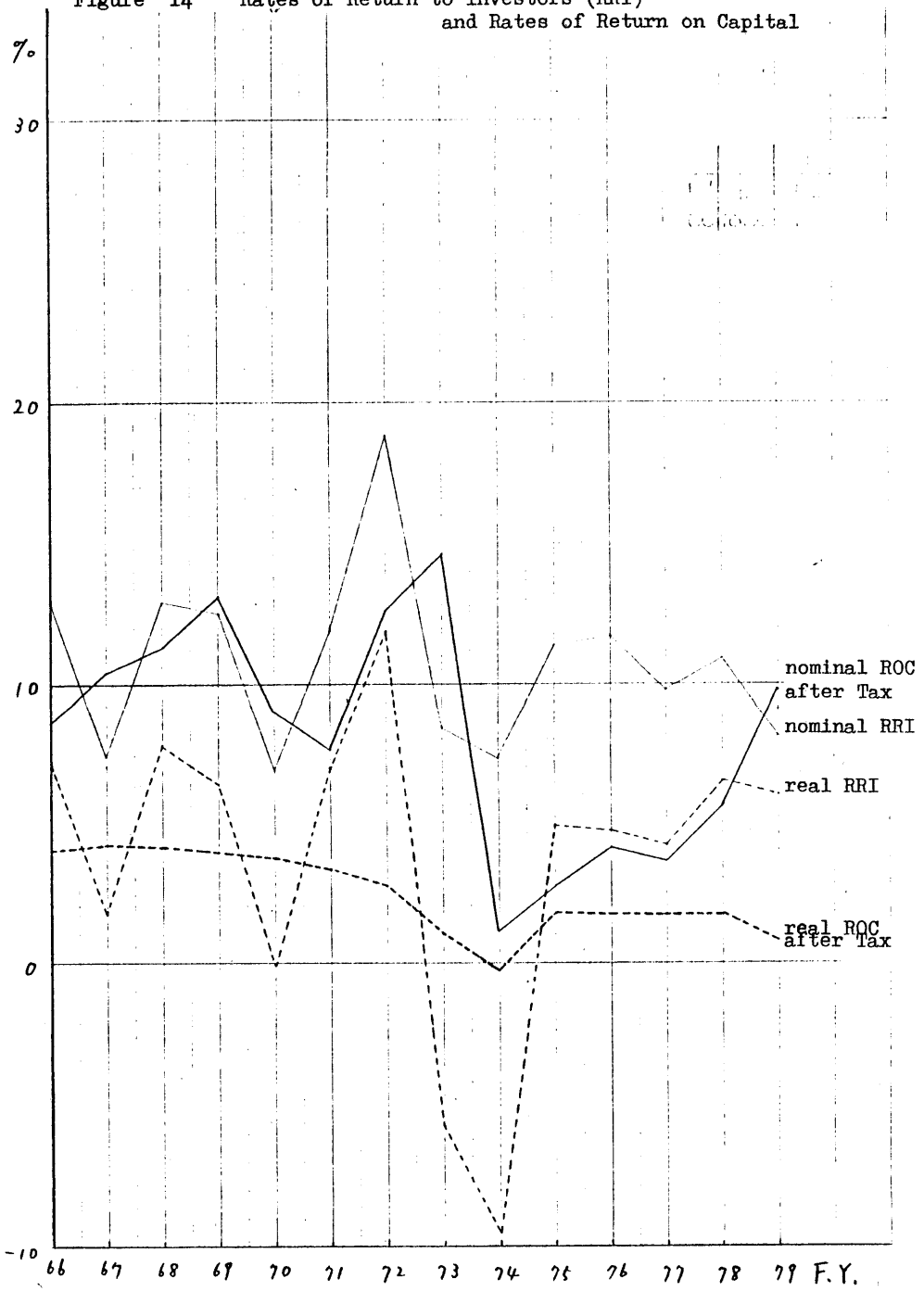


Figure 15 Tobin's q of All Industry

Figure 16 Correlation of q and q'

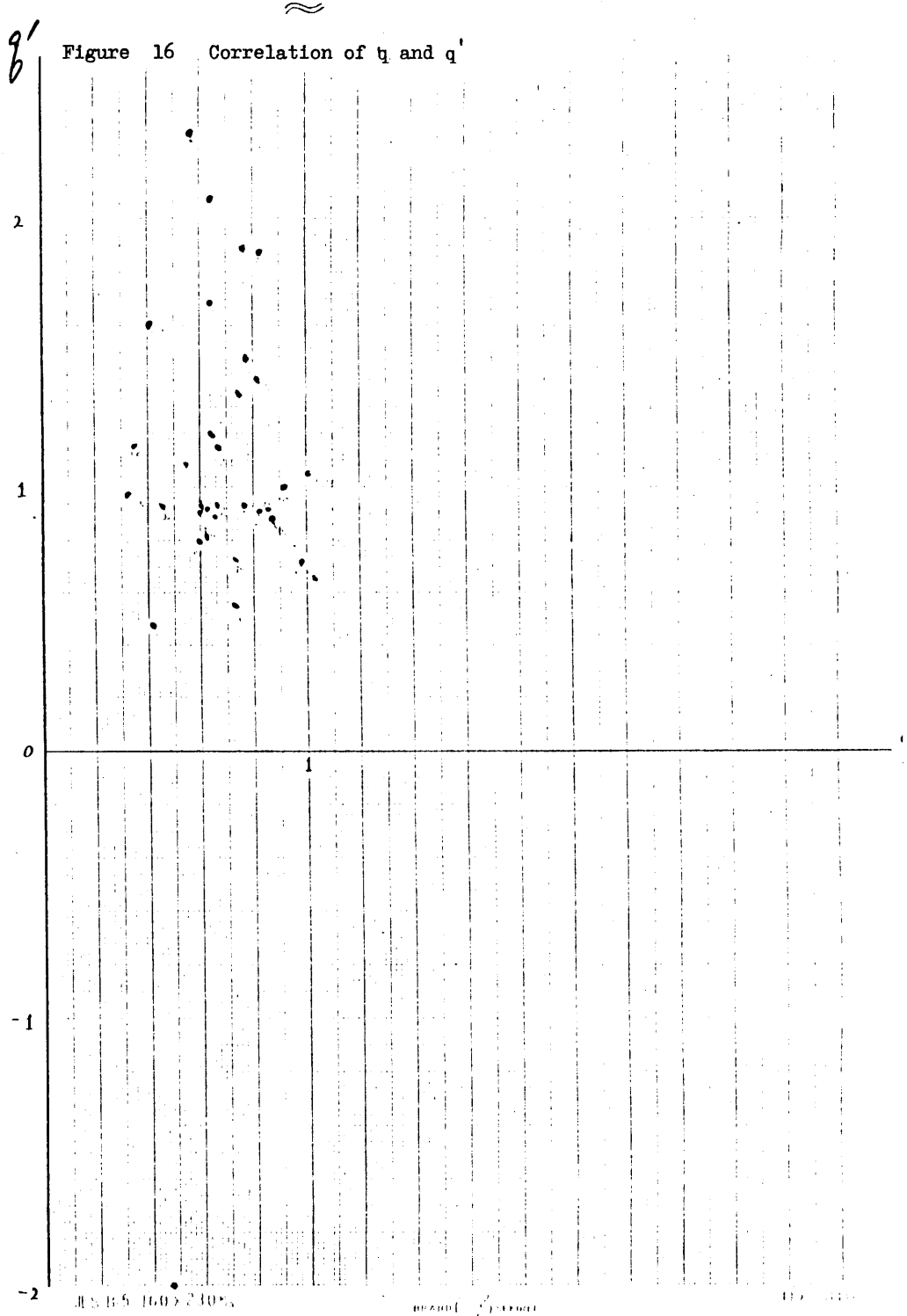


Figure 17-1 Variation of Real Rates of Return on Capital for Each Industry

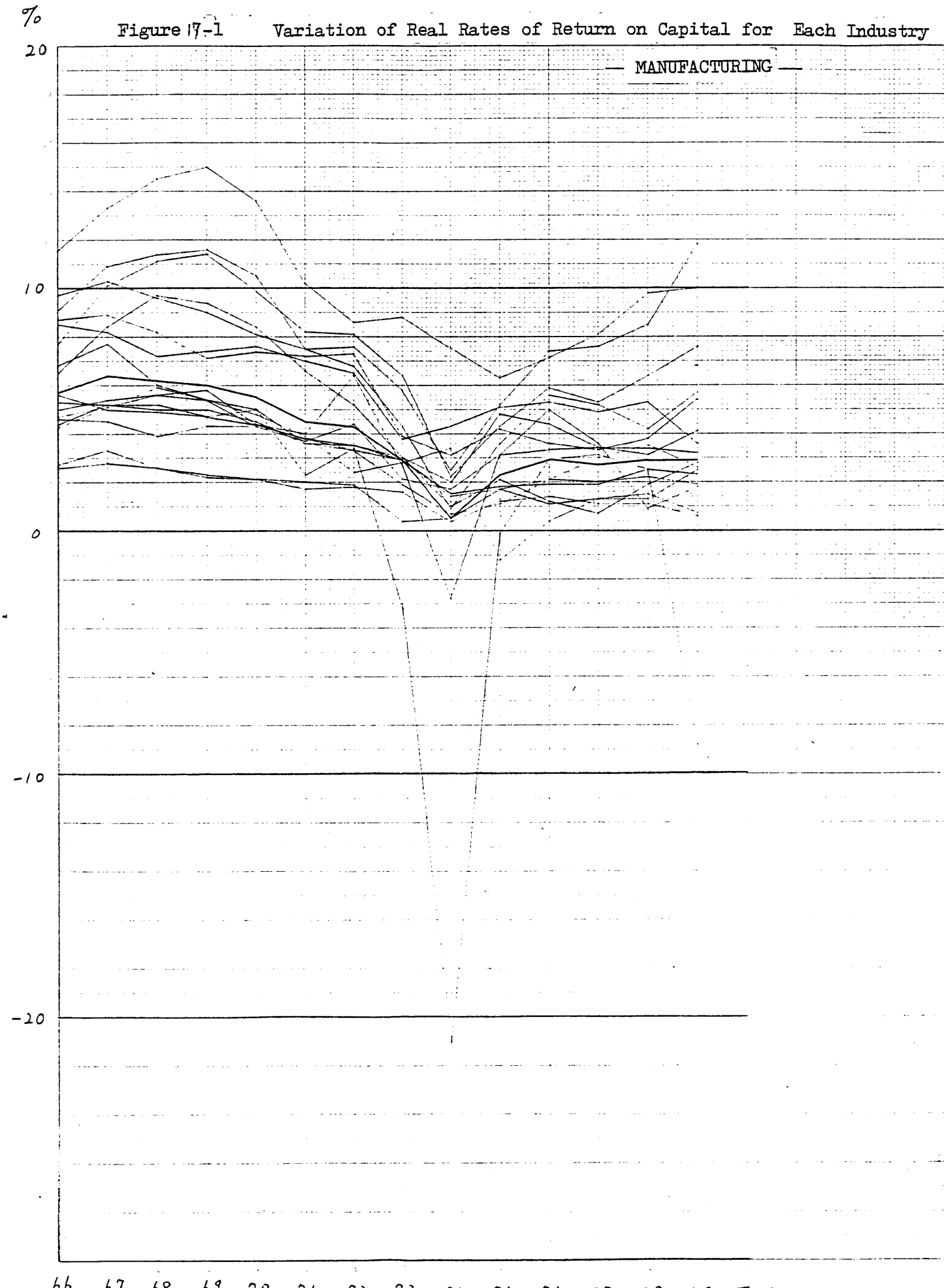


Figure 17-2 Variation of Real Rates of Return on Capital for Each Industry

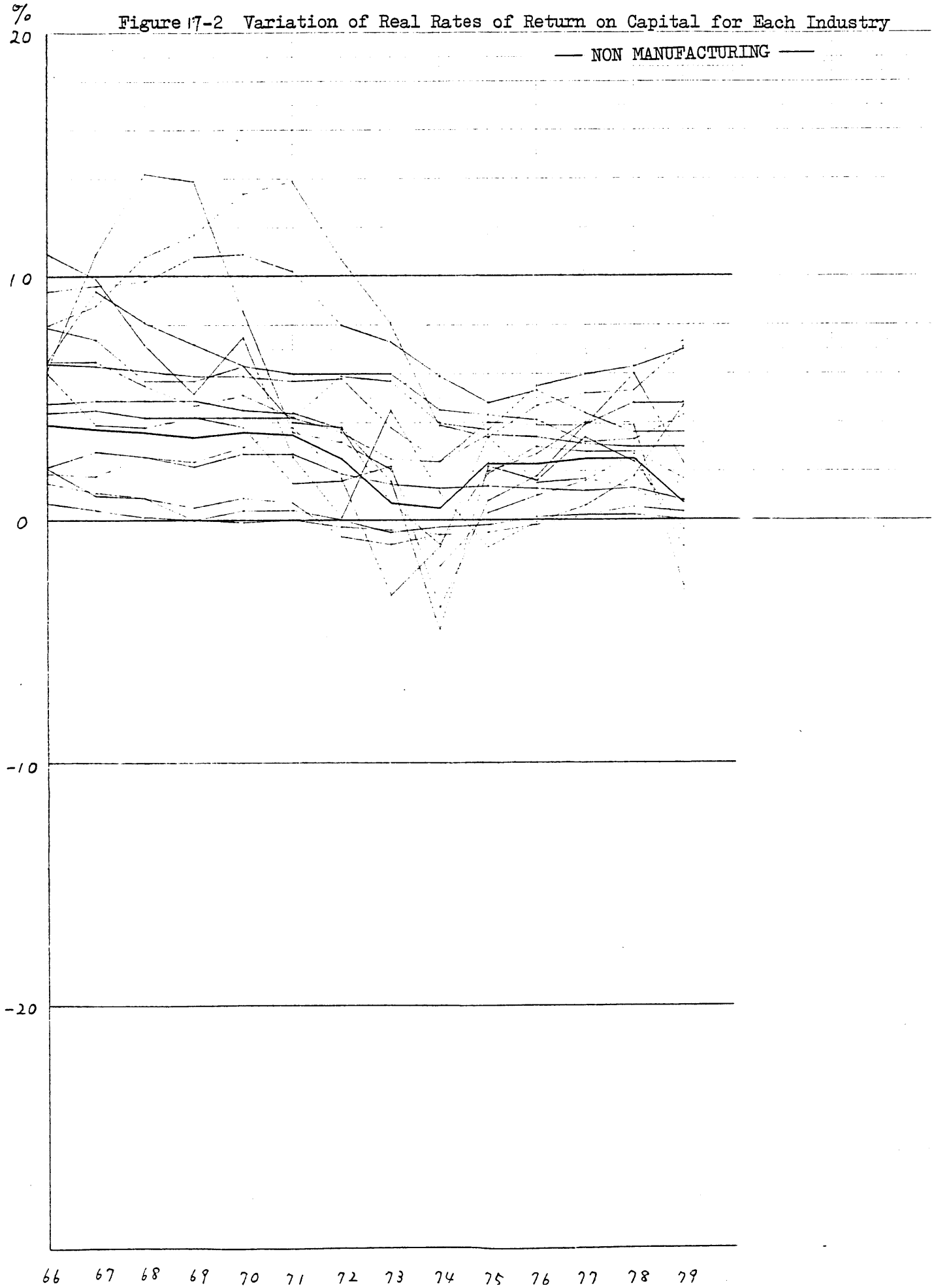


Table 1 Rates of Return on Capital Based upon Old SNA

%

Calendar Year	Pre-Valuation Adjustment Rate		Post-Valuation Adjustment Rate		After Taxes and Valuation Adjustments	
	ALL INDUSTRY	MFG.	ALL INDUSTRY	MFG.	ALL INDUSTRY	MFG.
1955	9.72	12.40	—	—	—	—
56	10.57	12.89	7.10	13.82	4.75	10.63
57	9.74	11.60	7.74	22.39	5.13	18.74
58	9.31	10.25	13.42	16.81	11.03	13.87
59	10.21	11.31	8.67	12.27	6.31	9.38
60	11.91	13.45	7.73	11.68	4.94	7.64
61	11.24	13.20	7.19	10.55	4.33	6.96
62	11.30	11.62	10.12	11.58	7.16	8.37
63	11.02	10.80	9.90	5.79	7.18	2.88
64	11.14	10.70	9.35	9.40	6.71	6.70
65	9.95	9.62	9.63	9.75	7.17	7.32
66	10.04	11.51	12.77	15.21	10.57	12.58
67	10.19	10.19	10.74	10.71	8.55	8.36
68	10.69	11.16	10.52	10.60	8.13	8.00
69	11.53	11.77	8.47	7.82	5.98	5.12
70	11.39	11.45	8.97	7.96	6.26	5.12
71	10.66	10.48	10.11	9.21	7.46	6.53
72	11.18	10.65	9.53	7.86	7.19	5.54
73	12.59	11.98	7.34	5.94	5.12	3.70
74	8.40	8.15	6.20	5.40	3.28	2.37

Table 2 Rates of Return on Capital Based upon New SNA

Fiscal Year	Real Rate of Return Before Tax	Return After Tax
1970	8.5	7.0
71	6.9	5.5
72	6.7	5.5
73	5.6	4.2
74	3.8	2.2
75	3.5	2.2
76	3.8	2.7
77	3.5	2.3
78	3.8	2.5
79	3.7	2.4

Table 3 The Classification of Industries and the Number of Firms Included

FOODS	48	MARINE	6
TEXTILE	41	MINING	5
PAPER & PULP	17	CONSTRUCTION	76
CHEMICALS	79	TRADE	54
DRUGS	25	RETAIL	22
PETROLEUM	9	OTHER FINANCE	2
RUBBER	8	REAL ESTATE	13
CLAY & GLASS	30	RAILWAY & BUS	16
IRON & STEEL	35	TRUCKING	7
METAL	38	SEA TRANSPORT	15
MACHINERY	71	AIR TRANSPORT	3
ELECTRIC EQUIP	86	WAREHOUSING	9
SHIPBUILDING	7	COMMUNICATION	3
MOTOR VEHICLES	26	ELECTRIC POWER	9
TRANSPORT EQUIP	11	GAS	5
PRECISION	16	SERVICES	16
OTHER MNFG	21	NON MANUFACTURING	261
MANUFACTURING	568	ALL INDUSTRY	829

Table 4-1 Rates of Return on Capital

No. _____

ALL INDUSTRY

(%)

	Total Asset						Physical Asset After Tax /			Equity Asset *	
	Before Tax			After Tax						Before Tax	
	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real
66	9.7	4.9	9.1	8.6	4.0	7.5	7.3	7.0	13.2	10.7	5.8
67	11.6	5.3	9.9	10.4	4.2	8.1	9.5	9.0	16.1	12.9	6.3
68	12.5	5.1	9.7	11.3	4.1	7.9	10.4	9.7	16.3	13.7	6.0
69	14.3	5.0	10.5	13.1	3.9	8.6	12.0	11.0	19.2	15.4	5.7
70	10.1	4.7	9.8	9.0	3.7	8.0	7.5	7.1	17.0	10.8	5.3
71	8.4	4.1	8.0	7.6	3.3	6.7	5.8	5.6	11.7	8.8	4.4
72	13.5	3.5	8.0	12.6	2.7	6.5	10.7	9.8	12.6	13.8	3.7
73	15.6	1.9	9.5	14.6	1.0	7.6	11.0	9.7	16.7	15.0	1.3
74	1.9	0.5	8.2	1.1	-0.3	6.7	-4.0	-3.9	10.2	0.4	-1.0
75	3.4	2.3	6.4	2.7	1.7	5.2	-1.0	-1.0	2.4	2.7	1.7
76	5.0	2.6	7.4	4.1	1.7	5.8	0.5	0.5	7.1	4.6	2.1
77	4.5	2.6	6.6	3.6	1.7	5.1	0.5	0.5	5.7	4.2	2.2
78	6.7	2.7	6.7	5.6	1.7	5.0	3.3	3.1	7.9	6.6	2.6
79	10.9	1.9	7.9	9.8	0.8	6.0	6.3	5.8	11.3	10.4	1.3
MEAN	9.1	3.4	8.4	8.2	2.4	6.8	5.7	5.3	12.0	9.3	3.4

MANUFACTURING

	Total Asset						Physical Asset After Tax			Equity Asset *	
	Before Tax			After Tax						Before Tax	
	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real
66	10.1	5.7	10.0	8.9	4.5	8.2	7.9	7.6	14.1	11.6	6.9
67	12.5	6.4	11.4	11.1	5.1	9.2	10.7	10.1	18.0	14.4	8.0
68	13.3	6.2	11.2	11.9	4.9	9.0	11.5	10.8	17.9	15.1	7.7
69	15.2	6.0	12.1	13.8	4.7	9.7	13.2	12.1	21.2	16.9	7.3
70	11.0	5.5	10.8	9.7	4.3	8.8	8.6	8.2	17.6	12.1	6.4
71	8.8	4.5	8.3	8.0	3.7	6.9	6.3	6.1	10.8	9.5	5.0
72	13.7	4.3	8.7	12.7	3.4	7.1	11.4	10.4	13.2	14.5	4.8
73	16.4	2.9	11.5	15.0	1.7	9.0	12.1	10.7	19.9	16.3	2.7
74	2.6	0.5	9.4	1.6	-0.6	7.6	-3.7	-3.7	11.7	1.1	-1.0
75	3.5	2.3	6.3	2.8	1.6	5.1	-1.1	-1.1	0.9	2.8	1.7
76	5.6	2.9	7.8	4.5	1.8	6.0	1.0	1.0	7.0	5.2	2.5
77	4.8	2.7	6.8	3.8	1.7	5.1	0.8	0.7	5.1	4.5	2.3
78	7.6	2.9	7.2	6.4	1.7	5.2	4.2	4.0	8.0	7.6	2.8
79	13.5	2.9	10.0	11.9	1.4	7.2	9.3	8.4	15.2	13.5	2.8
MEAN	9.9	4.0	9.4	8.7	2.9	7.4	6.6	6.1	12.9	10.4	4.3

* Return on Equity Asset = Ordinary Profit/(Total Asset Value - Liability)

Table 4-2 ★

Rates of Return on Capital

No.

	Total Asset						Physical Asset			Equity Asset *		
	Before Tax			After Tax			After Tax			Before Tax		
	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real	Accounting	Nominal	Real	(%)
ALL INDUSTRY	9.1	3.4	8.4	8.2	2.4	6.8	5.7	5.3	12.0	9.3	3.4	
MANUFACTURING	9.9	4.0	9.4	8.7	2.9	7.4	6.6	6.1	12.9	10.4	4.3	
NON MANUFACTURING	8.2	2.6	7.1	7.5	1.9	5.9	4.5	4.1	10.1	7.9	2.2	
FOODS	10.2	3.1	9.5	8.6	1.6	6.4	7.0	6.4	10.9	10.5	3.3	
TEXTILE	8.9	3.0	7.9	8.2	2.4	6.7	5.0	4.6	6.3	8.6	2.7	
PAPER & PULP	10.7	1.6	7.8	10.4	1.4	6.9	8.3	7.4	7.1	10.5	1.5	
CHEMICALS	9.5	3.3	8.7	8.7	2.6	7.3	5.8	5.3	10.2	9.9	3.5	
DRUGS	14.3	10.3	15.5	9.5	5.7	9.2	11.0	10.5	15.8	23.9	18.8	
PETROLEUM	6.5	0.5	6.6	5.5	-0.4	5.4	-4.8	-4.0	3.7	4.8	-0.7	
RUBBER	11.1	5.9	12.0	9.0	3.9	8.9	7.9	7.4	17.1	13.7	8.0	
CLAY & GLASS	10.5	3.3	10.0	9.4	2.3	7.7	7.4	6.8	10.6	10.6	3.3	
IRON & STEEL	9.7	3.6	8.8	9.1	3.0	7.8	6.0	5.5	12.3	10.1	3.9	
METAL	10.1	1.7	8.7	9.7	1.4	7.5	7.9	7.0	8.8	9.8	1.4	
MACHINERY	10.0	5.6	9.8	8.2	3.9	7.4	7.0	6.7	13.7	12.5	7.8	
ELECTRIC EQUIP	11.1	7.5	11.3	8.7	5.2	8.3	9.5	9.2	16.5	15.6	11.5	
SHIPBUILDING	7.0	3.6	6.5	6.5	3.1	5.8	4.1	4.0	17.1	6.5	3.0	
MOTOR VEHICLES	11.1	6.5	11.7	8.9	4.4	8.4	9.1	8.7	16.7	12.4	7.4	
TRANSPORT EQUIP	9.9	3.8	8.9	8.7	2.7	6.9	6.6	6.1	12.5	10.5	4.3	
PRECISION	12.1	8.4	12.5	9.2	5.6	9.0	9.6	9.3	16.4	17.7	13.4	
OTHER MNFG	12.1	6.1	12.5	9.4	3.5	8.3	8.5	7.9	14.7	14.5	8.0	
MARINE	8.5	2.7	8.0	7.7	2.0	6.8	1.9	1.8	10.9	8.3	2.5	
MINING	8.8	1.1	5.0	8.5	0.8	4.4	6.0	5.4	-6.3	8.1	0.4	
CONSTRUCTION	8.1	1.5	7.6	6.9	0.4	5.2	5.0	4.5	14.9	7.5	0.9	
TRADE	6.7	3.6	5.8	6.2	3.2	5.2	3.7	3.5	14.3	7.3	4.0	
RETAIL	10.5	5.0	10.1	8.4	2.9	7.1	6.0	5.6	13.2	12.2	6.4	
OTHER FINANCE	10.8	8.2	5.5	9.9	7.4	4.5	41.5	40.5	19.5	19.3	16.1	
REAL ESTATE	8.0	0.3	8.1	7.5	-0.2	6.7	5.2	4.5	9.7	7.5	-0.2	
RAILWAY & BUS	8.9	0.1	6.9	8.6	-0.1	6.2	5.9	5.1	4.2	8.3	-0.4	
TRUCKING	12.4	5.3	9.4	11.0	4.0	6.8	10.0	9.2	8.7	13.7	6.4	
SEA TRANSPORT	7.2	4.1	6.6	6.9	3.8	6.3	8.7	8.1	11.9	7.5	4.3	
AIR TRANSPORT	7.8	4.7	7.3	7.4	4.2	6.6	8.2	7.8	8.5	9.0	5.7	
WAREHOUSING	13.5	7.4	11.1	11.3	5.3	7.9	11.0	10.3	10.2	16.4	9.8	
COMMUNICATION	13.4	5.5	17.5	10.3	2.6	10.0	10.0	9.0	15.5	14.3	6.2	
ELECTRIC POWER	9.7	3.0	8.2	8.9	2.2	7.0	4.8	4.5	8.0	10.0	3.2	
GAS	9.7	4.0	9.0	8.1	2.5	6.8	5.1	4.7	8.1	10.4	4.7	
SERVICES	10.7	1.9	8.3	10.1	1.2	6.0	8.9	7.9	6.0	10.4	1.5	

★ Mean between 1966-1979

Table 5-1 Tax Rates

(%)

	Return on Capital		Return on Equity		Equity/Equity and Debt	
	legal	effective	legal	effective	B.V.	M.V.
ALL INDUSTRY	19.7	39.3	43.2	-117.0	19.9	27.3
MANUFACTURING	21.2	43.5	43.2	97.0	23.4	31.2
NON MANUFACTURING	17.2	38.3	45.2	71.6	15.3	22.1
FOODS	33.7	66.3	51.4	75.6	29.4	43.0
TEXTILE	11.3	23.7	24.4	3185.6	25.2	26.5
PAPER & PULP	11.5	23.9	1119.2	-60.5	16.0	18.6
CHEMICALS	16.1	27.4	60.2	-654.1	20.0	27.4
DRUGS	41.3	46.6	49.6	58.0	43.1	52.3
PETROLEUM	21.3	0.7	47.6	52.9	13.0	23.6
RUBBER	26.2	39.5	39.3	113.8	28.9	37.7
CLAY & GLASS	22.6	34.5	47.9	10.2	29.5	39.1
IRON & STEEL	11.2	23.2	23.1	47.2	18.8	19.0
METAL	13.3	28.7	86.2	127.6	19.8	23.7
MACHINERY	24.8	35.4	43.0	70.9	25.9	37.2
ELECTRIC EQUIP	27.0	34.0	38.7	25.3	30.3	43.9
SHIPBUILDING	10.3	10.8	13.3	84.7	11.4	13.0
MOTOR VEHICLES	27.8	40.3	38.7	46.2	32.1	40.4
TRANSPORT EQUIP	22.4	32.6	45.5	302.3	22.0	32.6
PRECISION	28.2	35.5	41.6	36.4	31.7	45.5
OTHER MNFG	33.3	45.2	45.7	76.6	34.1	48.7
MARINE	14.0	29.0	22.1	9.6	14.9	18.6
MINING	13.0	14.5	37.8	45.4	18.1	44.4
CONSTRUCTION	31.3	618.5	49.5	50.0	17.2	27.0
TRADE	10.6	12.2	47.3	74.5	6.2	9.9
RETAIL	30.2	43.3	49.3	80.1	24.1	40.1
OTHER FINANCE	16.9	11.7	44.1	28.1	6.1	15.3
REAL ESTATE	17.1	31.8	46.3	-30.8	19.1	36.0
RAILWAY & BUS	10.5	-3631.2	65.1	-15.2	15.1	28.0
TRUCKING	27.5	26.8	51.3	51.5	28.1	40.3
SEA TRANSPORT	7.1	31.5	13.9	-1.1	22.0	29.4
AIR TRANSPORT	24.6	10.3	29.9	40.7	31.1	47.6
WAREHOUSING	29.3	31.8	43.6	53.7	41.2	47.5
COMMUNICATION	43.0	52.9	48.9	62.5	51.0	54.9
ELECTRIC POWER	14.1	17.6	44.6	37.9	23.2	23.6
GAS	21.9	27.1	17.2	-17.2	31.7	40.7
SERVICES	27.4	36.5	54.2	186.5	32.8	47.7

Mean between 1966-1979

Table 5-2 Tax Rates

ALL INDUSTRY

(%)

F.Y.	Return on Capital: legal	Return on Capital: effective	Return on Equity: legal	Return on Equity: effective	Equity/Equity and Debt: B.V.	Equity/Equity and Debt: M.V.
65	16.9		35.8		24.9	27.5
66	17.3	19.6	32.3	41.3	24.5	29.0
67	17.9	19.9	31.0	37.6	23.0	25.3
68	18.5	20.5	32.4	38.9	22.3	26.7
69	18.8	22.2	31.6	42.9	21.4	27.5
70	18.4	21.8	33.1	46.1	20.8	23.6
71	16.4	18.8	35.2	48.3	20.1	24.9
72	18.8	23.4	37.4	60.8	20.2	32.4
73	19.8	49.4	35.9	-412.3	18.4	28.3
74	18.2	166.3	44.3	-37.8	17.9	24.7
75	17.8	27.7	72.8	-156.5	17.2	25.1
76	20.7	33.8	55.4	-1419.6	17.2	26.5
77	23.2	34.4	60.8	415.4	18.0	27.9
78	25.6	36.1	54.6	142.9	18.8	30.6
79	24.4	55.8	47.7	-486.2	18.3	29.4

MANUFACTURING

F.Y.	Return on Capital: legal	Return on Capital: effective	Return on Equity: legal	Return on Equity: effective	Equity/Equity and Debt: B.V.	Equity/Equity and Debt: M.V.
65	17.5		35.4		28.0	30.2
66	18.2	20.0	31.7	37.3	27.7	32.3
67	19.2	20.4	30.4	33.7	26.4	28.6
68	19.8	21.0	31.9	35.0	25.5	30.3
69	19.7	22.5	30.6	37.8	24.9	31.9
70	19.0	21.8	32.0	40.5	24.1	26.4
71	16.8	18.4	34.9	42.4	23.4	26.7
72	19.1	21.7	35.1	44.9	23.9	35.5
73	21.4	42.8	34.0	163.0	22.5	32.5
74	19.8	226.6	41.6	-45.4	21.5	28.3
75	19.0	29.7	86.5	-133.6	20.3	28.7
76	22.8	35.9	55.6	499.6	20.4	31.5
77	25.4	37.9	62.4	321.2	21.5	32.3
78	28.3	40.1	54.2	124.4	22.8	36.3
79	27.9	50.6	44.6	157.5	22.9	36.0

Table 6 Relationship between Real Rates of Return on Capital and Inflation (CPI)

$RXR1_i = \alpha + \beta\left(\frac{\Delta CPI}{CPI}\right)$

	α	$t(\alpha)$	β	$t(\beta)$	$\bar{R}^2$	D.W.
ALL INDUSTRY	4.952	8.705	-0.200	-3.298	0.475	0.19
MANUFACTURING	5.810	8.326	-0.231	-3.100	0.444	0.29
NON MANUFACTURING	3.785	8.385	-0.155	-3.233	0.465	0.49
FOODS	4.636	11.278	-0.192	-4.374	0.614	0.82
TEXTILE	3.589	3.384	-0.071	-0.632	0.032	0.77
PAPER & PULP	2.229	6.533	-0.071	-1.956	0.241	0.32
CHEMICALS	4.366	6.546	-0.135	-1.900	0.231	0.24
DRUGS	12.417	9.504	-0.265	-1.901	0.231	0.65
PETROLEUM	9.048	3.696	-1.084	-4.149	0.589	1.34
RUBBER	7.805	8.511	-0.244	-2.500	0.342	0.26
CLAY & GLASS	4.343	7.288	-0.133	-2.096	0.268	0.25
IRON & STEEL	5.232	5.068	-0.203	-1.843	0.220	0.30
METAL	2.575	7.578	-0.108	-2.992	0.427	0.43
MACHINERY	7.534	6.271	-0.247	-1.930	0.236	0.38
ELECTRIC EQUIP	10.144	9.880	-0.337	-3.075	0.440	0.64
SHIPBUILDING	6.077	6.307	-0.307	-2.993	0.427	1.14
MOTOR VEHICLES	9.458	9.459	-0.377	-3.537	0.517	0.49
TRANSPORT EQUIP	5.151	12.776	-0.168	-3.918	0.561	0.48
PRECISION	11.696	13.410	-0.417	-4.483	0.626	1.37
OTHER MNFG	7.404	10.298	-0.170	-2.225	0.292	0.38
MARINE	5.655	7.235	-0.369	-4.423	0.617	2.13
MINING	1.883	3.014	-0.104	-1.562	0.169	0.38
CONSTRUCTION	3.255	4.361	-0.222	-2.789	0.373	1.27
TRADE	4.300	15.358	-0.090	-3.014	0.430	0.32
RETAIL	6.445	16.812	-0.184	-4.498	0.627	0.17
OTHER FINANCE	10.375	6.236	-0.272	-1.534	0.163	0.36
REAL ESTATE	1.034	3.539	-0.098	-3.142	0.451	1.31
RAILWAY & BUS	0.447	3.838	-0.042	-3.448	0.497	1.55
TRUCKING	5.723	7.803	-0.048	-0.623	0.031	0.32
SEA TRANSPORT	5.977	3.265	-0.242	-1.239	0.113	0.94
AIR TRANSPORT	8.420	3.430	-0.473	-1.807	0.213	0.45
WAREHOUSING	8.237	5.847	-0.103	-0.689	0.038	0.16
COMMUNICATION	6.297	14.068	-0.104	-2.178	0.283	1.39
ELECTRIC POWER	5.079	4.906	-0.264	-2.397	0.323	0.51
GAS	8.274	5.082	-0.534	-3.075	0.440	0.41
SERVICES	2.211	6.698	-0.045	-1.294	0.122	0.36

Table 9-1 Revaluation Ratio

ALL INDUSTRY

	Asset	Physical Asset	Inventories	Depreciable	Land	Debt & Equity	Equity	Return on Capital	Return on Equity
65	1.556	2.216	1.075	1.073	17.741	1.037	1.148		
66	1.587	2.308	1.077	1.096	17.200	1.064	1.261	0.884	0.857
67	1.608	2.369	1.075	1.134	16.681	1.031	1.137	0.900	0.878
68	1.648	2.475	1.080	1.145	17.241	1.060	1.268	0.905	0.854
69	1.670	2.561	1.079	1.177	17.775	1.084	1.392	0.844	0.810
70	1.645	2.526	1.067	1.198	17.722	1.037	1.179	0.843	0.803
71	1.666	2.598	1.075	1.166	17.927	1.064	1.319	0.873	0.831
72	1.755	2.867	1.100	1.199	19.846	1.180	1.893	0.806	0.745
73	1.822	3.059	1.115	1.254	21.445	1.139	1.755	0.601	0.241
74	1.750	2.754	1.094	1.666	18.082	1.091	1.510	0.109	-0.202
75	1.692	2.670	1.063	1.619	16.722	1.106	1.616	0.642	0.467
76	1.685	2.688	1.058	1.659	16.473	1.127	1.742	0.612	0.459
77	1.700	2.701	1.045	1.643	16.098	1.137	1.761	0.674	0.538
78	1.721	2.754	1.038	1.598	16.737	1.171	1.911	0.710	0.613
79	1.744	2.803	1.054	1.540	18.337	1.158	1.833	0.438	0.277

MANUFACTURING

	Asset	Physical Asset	Inventories	Depreciable	Land	Debt & Equity	Equity	Return on Capital	Return on Equity
65	1.555	2.237	0.999	1.065	18.661	1.032	1.115		
66	1.584	2.332	1.003	1.097	17.875	1.068	1.244	0.914	0.895
67	1.591	2.338	1.000	1.127	16.907	1.030	1.113	0.940	0.925
68	1.619	2.396	1.000	1.136	17.543	1.069	1.271	0.944	0.931
69	1.637	2.446	1.004	1.183	18.387	1.104	1.416	0.878	0.848
70	1.618	2.390	1.003	1.194	18.327	1.030	1.126	0.874	0.845
71	1.632	2.437	1.001	1.221	18.232	1.045	1.192	0.916	0.899
72	1.733	2.734	1.001	1.171	19.503	1.180	1.753	0.851	0.834
73	1.789	2.965	1.021	1.248	21.223	1.149	1.663	0.501	0.365
74	1.723	2.677	1.032	1.599	17.400	1.094	1.638	0.057	-0.138
75	1.656	2.562	1.004	1.557	16.451	1.118	1.550	0.635	0.554
76	1.653	2.592	1.002	1.627	16.019	1.163	1.801	0.635	0.528
77	1.674	2.650	1.000	1.632	15.744	1.160	1.745	0.672	0.560
78	1.739	2.784	1.000	1.553	16.636	1.212	1.931	0.706	0.590
79	1.777	2.901	1.005	1.434	18.806	1.206	1.889	0.551	0.378

Table 9-2 Revaluation Ratio *

	Asset	Physical Asset	Inventories	Depreciable	Land	Debt & Equity	Equity	Return on Capital	Return on Equity
ALL INDUSTRY	1.692	2.652	1.073	1.377	17.735	1.104	1.543	0.689	0.586
MANUFACTURING	1.680	2.570	1.005	1.343	17.739	1.116	1.512	0.724	0.642
NON MANUFACTURING	1.710	2.775	1.185	1.420	17.719	1.089	1.606	0.620	0.467
FOODS	1.954	2.952	1.004	1.360	16.549	1.243	1.838	0.666	0.607
TEXTILE	1.718	2.760	1.004	1.403	25.482	1.022	1.115	0.486	0.711
PAPER & PULP	2.981	4.966	1.005	1.386	34.835	1.034	1.263	0.669	0.596
CHEMICALS	1.811	2.901	1.004	1.323	18.939	1.104	1.549	0.713	0.640
DRUGS	1.344	2.116	1.002	1.365	8.574	1.219	1.501	0.901	0.888
PETROLEUM	1.352	1.811	1.009	1.407	4.856	1.146	2.239	0.151	-0.013
RUBBER	1.498	2.197	1.004	1.298	12.174	1.148	1.511	0.743	0.707
CLAY & GLASS	2.120	3.605	1.006	1.398	18.690	1.161	1.569	0.717	0.642
IRON & STEEL	1.653	2.081	1.006	1.341	16.268	1.004	1.085	0.661	0.591
METAL	3.198	6.187	1.006	1.379	78.554	1.052	1.327	0.715	0.637
MACHINERY	1.359	2.016	1.006	1.353	11.369	1.184	1.717	0.782	0.713
ELECTRIC EQUIP	1.285	1.773	1.001	1.288	11.243	1.249	1.822	0.853	0.813
SHIPBUILDING	1.234	1.641	1.011	1.405	11.934	1.020	1.214	0.695	-2.016
MOTOR VEHICLES	1.482	2.396	1.001	1.288	10.247	1.153	1.460	0.788	0.643
TRANSPORT EQUIP	1.735	2.797	1.005	1.377	14.613	1.163	1.727	0.780	0.731
PRECISION	1.243	1.617	1.003	1.279	8.986	1.270	1.839	0.848	0.818
OTHER MNFG	1.585	2.332	1.006	1.290	11.101	1.291	1.848	0.781	0.752
MARINE	1.433	2.003	1.010	1.383	13.841	1.048	1.339	0.405	0.059
MINING	2.541	5.300	1.003	1.448	84.318	1.562	4.061	0.152	0.924
CONSTRUCTION	2.012	3.131	1.018	1.289	34.743	1.137	1.787	0.410	0.217
TRADE	1.428	4.815	1.001	1.277	28.619	1.041	1.658	0.892	0.775
RETAIL	1.396	1.874	1.004	1.386	4.160	1.268	2.123	0.728	0.683
OTHER FINANCE	1.107	1.301	1.330	1.098	10.232	1.110	2.834	1.680	2.067
REAL ESTATE	3.120	4.266	2.044	1.646	18.151	1.270	2.407	0.061	-0.121
RAILWAY & BUS	2.871	4.138	2.044	1.504	16.607	1.183	2.311	0.036	-0.244
TRUCKING	1.873	3.026	1.330	1.333	5.956	1.222	1.779	1.117	1.137
SEA TRANSPORT	1.132	1.272	1.001	1.268	1.914	1.125	1.521	0.555	3.424
AIR TRANSPORT	1.910	2.544	1.000	1.064	47.528	1.327	2.094	0.131	0.999
WAREHOUSING	1.478	2.085	1.329	1.542	4.758	1.134	1.348	0.995	0.988
COMMUNICATION	2.471	4.138	1.004	1.324	17.861	1.112	1.218	0.831	0.814
ELECTRIC POWER	1.574	1.787	1.011	1.476	7.504	1.005	1.071	0.491	0.461
GAS	1.418	1.620	1.006	1.225	5.347	1.155	1.537	0.486	0.430
SERVICES	3.511	5.689	1.330	1.589	20.648	1.301	1.962	0.779	0.709

* Mean between 1966-197

Table 10 Trend in Tobin's"q"

$q = \alpha + \beta T$

	α	$t(\alpha)$	β	$t(\beta)$	$\bar{R}^2$	D.W.
ALL INDUSTRY	0.645	62.474	0.0009	0.861	0.054	1.35
MANUFACTURING	0.650	61.959	0.001	1.509	0.149	1.67
NON MANUFACTURING	0.636	52.618	0.0002	0.209	0.003	1.06
FOODS	0.594	22.189	0.005	1.841	0.206	0.83
TEXTILE	0.590	36.953	0.0007	0.416	0.013	0.98
PAPER & PULP	0.358	37.730	-0.001	-1.070	0.080	0.55
CHEMICALS	0.589	76.620	0.002	3.044	0.416	1.68
DRUGS	0.831	11.990	0.009	1.264	0.109	0.88
PETROLEUM	0.925	18.081	-0.007	-1.363	0.125	0.46
RUBBER	0.801	26.794	-0.003	-1.051	0.078	0.61
CLAY & GLASS	0.527	39.982	0.002	1.747	0.190	1.24
IRON & STEEL	0.651	64.781	-0.004	-4.343	0.592	1.15
METAL	0.281	37.292	0.005	7.057	0.793	0.57
MACHINERY	0.846	45.851	0.002	1.313	0.117	2.08
ELECTRIC EQUIP	0.924	21.387	0.005	1.074	0.081	1.58
SHIPBUILDING	0.838	59.789	-0.001	-0.917	0.060	0.93
MOTOR VEHICLES	0.526	21.397	-0.005	-1.204	0.100	0.86
TRANSPORT EQUIP	0.666	40.582	0.0003	0.185	0.002	1.96
PRECISION	0.876	13.395	0.016	2.319	0.292	0.99
OTHER MNFG	0.592	22.441	-0.008	-1.953	0.226	1.21
MARINE	0.748	24.293	-0.0009	-0.270	0.005	0.48
MINING	0.441	5.899	0.022	2.715	0.361	0.91
CONSTRUCTION	0.522	30.550	0.005	2.850	0.384	1.38
TRADE	0.761	39.571	-0.003	-1.442	0.137	0.35
RETAIL	0.820	38.687	0.010	4.575	0.616	1.63
OTHER FINANCE	1.033	38.444	-0.003	-1.147	0.091	0.92
REAL ESTATE	0.559	16.013	-0.016	-4.194	0.575	0.54
RAILWAY & BUS	0.342	27.864	0.008	6.290	0.752	1.52
TRUCKING	0.744	12.249	-0.008	-1.322	0.118	0.54
SEA TRANSPORT	0.984	15.676	0.002	0.317	0.007	1.17
AIR TRANSPORT	1.011	13.617	-0.032	-3.954	0.544	0.56
WAREHOUSING	0.683	15.737	0.012	2.003	0.342	1.11
COMMUNICATION	0.307	7.741	0.018	4.202	0.576	1.01
ELECTRIC POWER	0.678	32.834	-0.004	-1.873	0.212	0.74
GAS	0.890	14.230	-0.007	-1.903	0.228	0.87
SERVICES	0.394	34.382	-0.002	-2.035	0.241	1.61

Table 11 Calculated Tobin s q by Sector

	ALL INDUSTRY		MANUFACTURING	
	q	q'	q	q'
66	0.671	0.669	0.674	0.643
67	0.642	1.406	0.647	1.477
68	0.643	0.878	0.660	0.842
69	0.649	1.048	0.674	0.983
70	0.629	1.296	0.637	1.928
71	0.639	0.638	0.640	0.719
72	0.672	0.668	0.681	0.609
73	0.625	1.724	0.642	1.497
74	0.623	0.149	0.635	0.227
75	0.654	0.238	0.663	0.232
76	0.669	0.352	0.691	0.327
77	0.669	0.366	0.681	0.426
78	0.681	0.516	0.697	0.519
79	0.664	1.204	0.677	1.250

q = Market Value/ Total Asset in Current Price

q'= Return on Capital / Cost of Capital(= Return to Investors)

	q	q'
ALL INDUSTRY	0.652	0.797
MANUFACTURING	0.664	0.834
NON MANUFACTURING	0.637	0.791
FOODS	0.638	1.811
TEXTILE	0.595	0.727
PAPER & PULP	0.348	1.004
CHEMICALS	0.610	0.819
DRUGS	0.907	0.813
PETROLEUM	0.850	0.656
RUBBER	0.768	0.841
CLAY & GLASS	0.548	0.962
IRON & STEEL	0.609	0.825
METAL	0.330	0.851
MACHINERY	0.871	0.810
ELECTRIC EQUIP	0.973	0.671
SHIPBUILDING	0.827	0.798
MOTOR VEHICLES	0.781	1.349
TRANSPORT EQUIP	0.670	1.033
PRECISION	1.024	0.627
OTHER MNFG	0.822	1.631
MARINE	0.734	0.625
MINING	0.623	0.845
CONSTRUCTION	0.567	1.692
TRADE	0.730	0.471
RETAIL	0.910	0.895
OTHER FINANCE	1.005	1.953
REAL ESTATE	0.423	0.673
RAILWAY & BUS	0.414	1.357
TRUCKING	0.653	1.277
SEA TRANSPORT	0.996	51.456
AIR TRANSPORT	0.745	1.128
WAREHOUSING	0.765	2.037
COMMUNICATION	0.459	0.865
ELECTRIC POWER	0.641	1.548
GAS	0.818	1.194
SERVICES	0.373	-1.765

MEAN between 1966 and 1979

Table 12-1 Rates of Return to Investors

ALL INDUSTRY

	Nominal			Real		
	Equity	Debt	Total	Equity	Debt	Total
66	22.4	11.4	12.9	16.1	5.7	7.1
67	1.6	11.2	7.4	-3.8	5.3	1.7
68	27.5	11.2	12.9	21.8	6.2	7.8
69	27.9	11.2	12.5	21.0	5.2	6.4
70	-1.6	11.6	6.9	-8.0	4.3	-0.1
71	22.6	11.2	11.9	17.2	6.3	7.0
72	65.5	10.1	18.8	55.8	3.7	11.9
73	8.5	11.0	8.4	-5.7	-3.5	-5.7
74	-6.4	13.4	7.3	-21.0	-4.3	-9.5
75	11.7	12.7	11.4	5.2	6.1	4.9
76	16.2	11.8	11.7	8.9	4.8	4.7
77	8.8	10.7	9.8	3.2	5.0	4.2
78	18.0	9.4	10.9	13.4	5.1	6.5
79	6.2	10.3	8.1	4.1	5.1	6.0

MANUFACTURING

	Nominal			Real		
	Equity	Debt	Total	Equity	Debt	Total
66	24.1	11.8	13.9	17.7	6.1	8.1
67	2.2	11.5	7.5	-3.2	5.5	1.8
68	31.4	11.4	14.2	25.5	6.4	9.1
69	31.8	11.4	14.0	24.7	5.4	7.9
70	-7.5	11.7	5.0	-13.6	4.4	-1.9
71	15.1	11.4	11.1	10.0	6.5	6.2
72	67.1	10.5	25.8	57.3	4.1	13.7
73	12.8	11.4	10.0	-1.9	-3.1	-4.3
74	-6.4	14.1	6.9	-21.0	-3.7	-9.8
75	13.1	13.4	12.0	6.5	6.8	5.5
76	23.0	12.3	13.8	15.3	5.3	6.7
77	4.4	11.2	8.9	-0.9	5.5	3.3
78	19.8	9.9	12.3	15.1	5.6	7.9
79	9.1	11.3	9.5	7.0	9.1	7.4

adjusted by deflator of GNP

Table 12-2 Rates of Return to Investors

	Nominal			Real		
	Equity	Debt	Total	Equity	Debt	Total
ALL INDUSTRY	16.4	11.2	10.8	9.2	4.1	3.8
MANUFACTURING	17.1	11.7	11.4	9.9	4.6	4.4
NON MANUFACTURING	15.5	10.7	10.1	8.4	3.7	3.1
FOODS	13.8	13.9	11.8	6.6	6.6	4.8
TEXTILE	15.4	12.7	11.6	8.3	5.5	4.5
PAPER & PULP	17.8	11.3	10.5	10.4	4.2	3.5
CHEMICALS	16.5	11.6	11.1	9.1	4.4	4.1
DRUGS	21.4	15.0	14.3	14.0	7.6	7.1
PETROLEUM	27.1	12.4	12.5	19.6	5.3	5.4
RUBBER	17.3	13.5	12.6	9.9	6.3	5.4
CLAY & GLASS	14.0	11.9	11.1	6.9	4.8	4.1
IRON & STEEL	19.8	11.2	10.9	12.1	4.1	3.8
METAL	16.8	13.2	12.2	9.5	5.9	5.0
MACHINERY	18.3	12.5	12.2	11.0	5.3	5.1
ELECTRIC EQUIP	20.8	12.4	12.4	13.5	5.3	5.4
SHIPBUILDING	19.0	8.8	8.7	11.5	1.9	1.8
MOTOR VEHICLES	20.6	11.2	11.9	13.3	4.1	4.9
TRANSPORT EQUIP	19.0	13.1	12.5	11.7	5.9	5.4
PRECISION	25.7	13.8	14.1	18.0	6.6	7.0
OTHER MNFG	17.6	13.2	12.3	10.3	6.0	5.2
MARINE	14.3	13.9	12.7	7.1	6.6	5.6
MINING	29.6	9.4	12.4	21.5	2.5	5.4
CONSTRUCTION	18.4	12.9	11.8	11.1	5.8	4.8
TRADE	19.1	15.3	13.4	11.8	7.9	6.1
RETAIL	18.1	11.5	11.5	10.8	4.4	4.5
OTHER FINANCE	33.1	6.5	7.0	25.1	-3.2	0.3
REAL ESTATE	14.4	5.6	9.0	7.4	1.7	2.2
RAILWAY & BUS	17.2	8.6	9.1	10.1	1.7	2.2
TRUCKING	15.4	11.3	10.7	5.1	4.2	3.7
SEA TRANSPORT	24.7	7.0	7.9	17.0	0.2	1.0
AIR TRANSPORT	25.2	7.9	11.8	17.6	1.0	4.8
WAREHOUSING	17.0	10.6	11.0	9.7	3.6	4.0
COMMUNICATION	22.6	10.4	12.3	15.0	3.4	5.2
ELECTRIC POWER	15.0	5.0	5.2	7.9	1.2	1.4
GAS	13.4	9.3	9.1	6.3	2.3	2.2
SERVICES	8.4	10.6	10.8	5.3	3.5	3.9

MEAN between 1966 and 1979

Table 13 Regression of Real Rates of Return on Time

$RXR1_t = \alpha + \beta T$

	α	$t(\alpha)$	β	$t(\beta)$	$\bar{R}^2$	D.W.
ALL INDUSTRY	5.817	10.005	-0.288	-4.669	0.644	0.85
MANUFACTURING	6.920	10.100	-0.346	-4.752	0.653	0.88
NON MANUFACTURING	4.225	7.690	-0.197	-3.375	0.487	1.09
FOODS	4.743	7.445	-0.191	-2.829	0.400	0.57
TEXTILE	6.247	7.310	-0.379	-4.178	0.592	1.41
PAPER & PULP	3.029	14.023	-0.160	-6.995	0.803	1.78
CHEMICALS	6.010	16.127	-0.319	-8.071	0.844	0.73
DRUGS	14.360	10.837	-0.476	-3.379	0.487	0.55
PETROLEUM	6.904	1.615	-0.759	-1.671	0.188	1.64
RUBBER	9.587	12.823	-0.438	-5.511	0.716	1.05
CLAY & GLASS	5.654	13.478	-0.278	-6.249	0.764	0.75
IRON & STEEL	7.650	11.375	-0.474	-6.630	0.785	1.00
METAL	3.051	8.887	-0.160	-4.364	0.613	1.48
MACHINERY	9.797	9.359	-0.497	-4.467	0.624	0.97
ELECTRIC EQUIP	10.841	8.196	-0.396	-2.819	0.398	0.52
SHIPBUILDING	6.350	4.800	-0.319	-2.271	0.300	1.84
MOTOR VEHICLES	10.710	9.354	-0.499	-4.104	0.584	0.85
TRANSPORT EQUIP	5.439	9.896	-0.191	-3.272	0.471	1.26
PRECISION	10.220	6.111	-0.215	-1.214	0.109	0.62
OTHER MNFG.	8.932	10.125	-0.339	-4.044	0.752	1.32
MARINE	4.047	2.667	-0.155	-0.962	0.071	1.21
MINING	-0.078	-0.102	0.133	1.631	0.181	0.61
CONSTRUCTION	2.652	2.345	-0.136	-1.35	[illegible]	1.48
TRADE	4.710	16.304	-0.132	-4.308	0.607	[illegible]
RETAIL	6.708	12.116	-0.202	-3.443	0.425	0.92
OTHER FINANCE	12.552	7.029	-0.510	-2.688	0.375	0.51
REAL ESTATE	1.090	2.648	-0.098	-2.239	0.294	0.58
RAILWAY & BUS	0.782	2.148	-0.033	-1.729	[illegible]	[illegible]
TRUCKING	7.952	20.030	-0.307	-7.295	0.816	1.39
SEA TRANSPORT	9.586	6.823	-0.650	-3.717	0.535	1.20
AIR TRANSPORT	13.031	6.023	-0.984	-4.280	0.604	0.85
WAREHOUSING	12.510	17.148	-0.599	-7.731	0.832	0.54
COMMUNICATION	5.348	5.156	0.014	0.208	0.003	0.92
ELECTRIC POWER	6.036	4.943	-0.359	-2.771	0.390	1.38
GAS	10.762	6.558	-0.791	-4.536	[illegible]	1.22
SERVICES	3.058	14.514	-0.142	-6.479	0.777	1.37

Table 14 Estimation of Covariability

$RXR1_i = \alpha + \beta RXR1_M$ of Real Rates of Return on Capital

	α	$t(\alpha)$	β	$t(\beta)$	$\overline{R}^2$	D.W.
MANUFACTURING	0.040	0.170	1.170	17.920	0.963	1.53
NON MANUFACTURING	0.095	0.309	0.729	8.614	0.860	1.48
FOODS	0.528	1.442	0.768	7.688	0.831	0.94
TEXTILE	-0.044	-0.041	0.911	3.078	0.441	1.76
PAPER & PULP	0.094	0.506	0.466	9.130	0.874	1.03
CHEMICALS	0.231	0.660	0.909	9.504	0.882	1.12
DRUGS	5.015	4.484	1.574	5.157	0.689	1.25
PETROLEUM	-12.708	-4.160	3.911	4.690	0.647	1.77
RUBBER	1.529	2.250	1.288	6.942	0.800	1.25
CLAY & GLASS	0.503	1.487	0.827	8.957	0.869	0.98
IRON & STEEL	-0.741	-0.959	1.296	6.147	0.758	0.90
METAL	-0.060	-0.261	0.527	8.310	0.851	1.89
MACHINERY	0.228	0.293	1.588	7.465	0.822	1.35
ELECTRIC EQUIP	2.264	2.636	1.547	6.599	0.783	1.09
SHIPBUILDING	-0.715	-0.692	1.293	4.585	0.636	2.01
MOTOR VEHICLES	0.578	1.096	1.749	12.133	0.924	1.72
TRANSPORT EQUIP	1.363	4.881	0.728	9.552	0.883	2.13
PRECISION	3.937	2.991	1.322	3.679	0.530	0.73
OTHER MNFG	2.634	6.373	1.015	8.993	0.870	1.88
MARINE	-0.539	-0.653	1.060	3.021	0.432	1.31
MINING	1.280	1.391	-0.066	-0.264	0.005	0.52
CONSTRUCTION	-1.099	-1.100	2.770	2.823	0.399	1.64
TRADE	2.073	13.470	0.449	10.696	0.905	1.69
RETAIL	2.470	8.216	0.747	9.110	0.873	1.03
OTHER FINANCE	2.642	1.543	1.656	3.542	0.511	0.58
REAL ESTATE	-1.046	-3.092	0.787	4.194	0.594	1.23
RAILWAY & BUS	-0.384	-2.423	0.146	3.373	0.486	0.29
TRUCKING	3.159	4.306	0.646	3.228	0.464	0.93
SEA TRANSPORT	-1.712	-0.907	1.714	3.329	0.480	1.53
AIR TRANSPORT	-5.925	-3.534	3.147	6.876	0.797	1.19
WAREHOUSING	2.477	2.148	1.467	4.658	0.643	0.65
COMMUNICATION	5.066	7.234	0.120	0.629	0.031	0.95
ELECTRIC POWER	-1.497	-1.585	1.330	5.158	0.689	1.46
GAS	-4.759	-4.896	2.614	8.850	0.889	1.36
SERVICES	0.543	2.285	0.388	5.979	0.748	1.14