

MEASURES OF PERFORMANCE - THE SWEDISH CASE

by

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"I have never in my life found any measure
of performance that is suitable for any system."

C. West Churchman

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I. OBJECTIVES AND MAJOR CONCLUSIONS

Like companies in many other industrialized countries, most of the evidence concerning Swedish industry indicates the 1970's were a decade of poor profit performance. Many regard the mid-1960's as the starting point of a downward trend. This has raised concern for the consequences of the decline for industrial growth. The evidence suggests that decline in profitability goes hand in hand with declining growth, the main trade-off being changes in the equity-ratio (the ratio between owners' equity and total assets). And a decreased equity-ratio might in itself serve as a check to growth through its impact on financial risks (2). The need for increased profitability has therefore become an often heard argument in the economic and political debate. However, arguments have also been raised that the long-run profitability has not decreased and that the performance during the 1970's, viewed from a long-run perspective, should not necessarily be of great concern. (1)

The purpose of this essay is to bring some clarity to the simple question: how has Swedish industry fared up to the late 1970's? This question can, however, lead to many different research designs. Ours centers around the following two main aspects:

1. How does the performance from the mid-1970's compare with that of earlier periods? If there has been a decline in profitability, is it from an earlier stable level (in which case the decline might be alarming) or is it from an extraordinary high level, returning the profitability back to more "normal" levels (in which case the decline may be not so alarming)?

2. Is the result concerning performance sensitive to our choice of data, measures of performance and sample of companies? What are the most

valid descriptions?

The second question represents the type of question that usually gains very little attention. It will, however, be given a dominant roll in this report. For two reasons: first, the debate lacks precision and any effort to structure the discussion seems worthwhile. Secondly, this utilizes a comparative advantage the "Swedish case" has over many other countries. Large efforts have thus been made during recent years to make data of high quality available for research.

Questions are answered for two types of economic units, business groups and corporations. A business group is a group of companies linked together via ownership. Most often this takes the form of one parent company owning one or more subsidiaries. The business group thus corresponds with the "economic entity." We will concentrate on public business groups where the parent company is listed on the Stockholm Exchange.

If the performance of Swedish industry is studied in terms of the performance of business groups, "Swedish" is interpreted as "Swedish-owned." Foreign subsidiaries will be included along with domestic corporations, while foreign-owned companies in Sweden (i.e., subsidiaries to foreign parent companies) are excluded.

The second type of unit we will study is Swedish corporations. Here, "Swedish" is denoting legal corporations with residence in Sweden, despite the fact that they might be a subsidiary to a foreign company. The emphasis is on entities responsible for domestic production rather than entities with domestic ownership.

Two main types of measures will be used, market rates of return and accounting rates of return. The former are based on market data and describe rates of return earned by investors. They can thus only be con-

structured for entities for which market data can be found, i.e. business groups. The latter are based on accounting data of some form.

Two types of market rates of return will be used, return on total capital (debts and stocks) and return on stocks. Both measures will be expressed in both nominal and real terms, the difference being the rate of inflation (measured as the change in the Consumer Price Index - CPI). All market measures are expressed before personal taxes.

Several types of accounting rates of return will be used. They include rates of return on assets (all assets or only nonmonetary assets) and on owners' equity and they are expressed before as well as after company taxes. All accounting rates of return are expressed in real terms except for some measures for business groups based on historical costs, where also nominal figures are given.

With two exceptions, all descriptions concern the aggregate figures for business groups and corporations, respectively. (The exceptions are a description of market rate of return on stock, which is partly based on figures for the average firm, and a validity test comparing aggregate accounting figures with figures for individual firms.)

The periods covered in the report are determined by the data available. They will be:

<u>Entity</u>	<u>Market Rates of Return</u>	<u>Accounting Rates of Return</u>
Business groups	Stock: 1945-78 Total capital: 1967-78	All measures: 1967-78
Corporations	--	Aggregate: 1951-78 Individual firms: 1966-78

Our main conclusions are the following:

1. By all standards, Swedish industry has fared poorly since the mid-1960's. Decreasing profitability has been accompanied by decreasing equity ratios. In the 1970's the decrease has also been coupled with an increase in the rate of inflation.

2. However, the turning point as described by accounting rates of return came in the early 1960's rather than in the mid-1960's. The turning point for the market rate of return on shares occurred even earlier - in the middle of the 1950's.

3. The turning points marked an end of increasing profitability. The decline since then is thus not a decline from stable levels but back from a peak. Whether or not the decline is bigger than the previous increase depends on the measures used. The overall conclusion as to the question of a falling trend for the whole period covered thus becomes: not proven. However, returning to old levels doesn't mean returning to old conditions. The equity-ratio has been lowered and the evidence suggests increased financial risks. The paired reduction in profitability and reduced equity-ratio should be of great concern. Moreover, the period studied ends with a dramatic decline in profitability, down to levels never previously experienced during the period studied, i.e. since the early 1950's.

4. Accounting data based on historical costs for Swedish business groups reveals declining profitability and decreasing equity-ratio from the mid-1960's but the trends are not as dramatic as those observed from market data.

5. The decline since the mid-1960's in the real rate of return for Swedish corporations becomes more marked if we concentrate on larger corporations and thereby makes it possible to utilize data of highest available quality. It also becomes more marked if we look at the median firm among

these corporations instead of the aggregate. Further, behind the aggregate there are substantial differences among companies.

II. MEASURES OF PERFORMANCE

Before analyzing the empirical data, let's devote some attention to the important question of how performance - more specifically rate of return - of companies should be measured? Should we use market data or should we compute rates of return from accounting figures?

The use of market data is appealing. It is in the marketplace that performance ultimately should be assessed. The performance can be described with regard to stocks, debts or total capital. If the concern is on the overall performance, total capital should be the focus of analysis since we don't want the measure to be influenced by changes in the capital structure. In our analysis we will, however, also look at the performance of the stock.

To determine of market rates of return offers no big problems. The profit component consists of two parts, namely the change in market value of the company (the total value or the value of its stock or debt depending on what we are to measure) plus distributed income (dividends and interest). If performance is measured yearly, the profit component can conveniently be expressed as a function of initial market value. In symbols, the market rate of return for company i , period t , is then:

$$R_{it} = ((M_{it} - M_{i,t-1}) + D_{it} + I_{i,t})/M_{i,t-1}, \text{ where}$$

R = Market rate of return on total capital

M = Market value on total capital

D = Dividends

I = Interest distributed to debtholders

If performance is measured over a longer period, for example, a business

cycle, internal rates of return will be computed since the R_t s are very volatile when measured annually.

However, the obvious appeal of a measure of performance using market data should be qualified. First, the measure of performance will focus on earnings made by the investor and not on earnings made by the firm, the latter measure of performance being a way of describing the efficiency in which management has utilized the resources they have headed. It can be argued that in the long run these earnings should coincide, but in the short run differences most likely occur due to all restrictions there are as to changes in the firm's asset structure, etc. The impact of change in the way stockholders are taxed for the benefits from their ownership can be used as an example. In the short run it will affect market values but presumably not company profits. Second, market data are available only for public business groups. This restricts the number of companies and means a focus on the performance of Swedish capital - which should be separated from the performance of the domestic production apparatus. Third, even for public companies, market data are easily obtainable only for their stock. Market values for outstanding debt are not available except values on certain bonds. (How this problem has been approached will be discussed in the next section.)

By introducing accounting rates of return, i.e., rates of return based on accounting data (of some kind) instead of market data, some of the problems with the market rate of return are avoided. Accounting rates of return focus closer on outcomes over which management is supposed to have influence, and disregard some other factors that might be considered by the market. And they can be computed for all types of companies - not only public. They can also be computed for domestic companies, despite whoever owns them, and thus can focus on the domestic production apparatus.

Empirical measures of accounting rates of return have, however, received a rather bad reputation for use in economic analysis. There are at least three reasons for this. The first is the frequent lack of understanding of how accounting rates of return should be constructed. Secondly, the accounting rates of return are often based on historical costs which might cause invalid descriptions. And thirdly, there are few examples of valid descriptions of real rates of return based on accounting data.

We will try to bring some clarity to the construction of accounting rates of return. As a basis for discussion, refer to Figure 1.¹ The figure describes the firm in terms of how the capital invested and the income earned can be structured. It also gives examples on how different rates of return can be constructed. The income concepts and the rates of return are in nominal terms.

The first principle to keep in mind is that of matching income and capital concepts. If a rate of return on a certain capital is sought, an income concept should be used that includes the income earned by that capital.

For example, suppose we are interested in the rate of return earned on total capital. Then total capital should be measured as total assets (or total equity) and income should be measured as operating income plus financial income (for example, interest earned on monetary assets). Many macroeconomic studies lack data on monetary assets and are thus formulating arguments for using real capital (i.e., non-monetary assets) as the capital concept. In this case, the appropriate income concept to use is operating income. Often this is calculated before holding gains and losses, because of lack of data and the assumption that real holding gains and losses tend to even out over the long run.

These are trivial matters. Still, confusion stemming from bad matching

of income and capital concepts is frequent. We will exemplify this later but let's first consider the second principle concerning the selection of a basis for capital valuation (and thus measurement of income). The principle is straightforward: current costs should be used, not historical costs, if valid descriptions of accounting rates of return are to be reached. The arguments are well known and shall not be repeated here (cf. for example (8)).

However, under some circumstances accounting rates of return based on historical costs can be used as approximations for rates based on current costs. What is the rationale behind this? How can this statement be combined with the often heard argument that rates based on historical costs will overstate "true" rates (i.e., rates based on current costs)? Here, confusion with the matching of income with capital gives the key. The argument refers to a rate of return based on capital valued at historical prices as a measure of ROC, return on capital, where capital is interpreted as real capital and income thus is defined as operating income. If income is defined as operating income before holding gains/losses, the use of historical cost will overstate the income (mainly due to depreciation on historical cost) and understate capital. Both factors will work to overstate the "true" rate of return. Thus, it is said, historical costs cannot be used to approximate ROC.

However, the use of historical costs means that some of the holding gains/losses are included in the income, namely those that are realized during the period.² The relevant comparison is thus operating income including holding gains/losses. In times of rising prices, the "true" income (i.e., based on current costs) is typically understated if historical costs are used since unrealized holding gains/losses are left out. Since the capital

is also understated, the errors partly offset each other. This means that rate of return based on historical costs under certain circumstances might be used as approximations to rates based on current costs.³

Let there be no doubt, however, as to the preferences: current costs should be used if possible. But let the merits of historical costs be valued without confusion as to what kind of rate of return should be the basis for comparison. This can also be stated with respect to the third important criteria for the construction of rates of return: that of real vs. nominal rates.

A nominal rate of return is constructed with no adjustments made for changes in the general price level, i.e., inflation. The adjustments needed to construct a real rate of return are effects of a changing price level during the time capital is held. Whether we should call the ROC (based on current costs) before holding gains/losses a real or nominal rate of return becomes a matter of taste. It is nominal in the sense that no adjustments are made for changes in the general price level. It is real in the sense that nominal holding gains/losses are excluded. For the rates of return derived from income concepts after operating income in Figure 1, the correct labeling becomes more easy: it is nominal if correction is not made for changes in the general price level.⁴ If so done, it is a real rate of return (10).

The distinction between real and nominal rates of return is, of course, of greatest importance. As an illustration, let's return to the rate of return based on historical costs and the question of its use for approximating ROC. As stated earlier, ROC commonly defined in macroeconomic studies is based on operating income as an approximation for operating income including real holding gains/losses. The assumption is that real holding gains/

losses tend to offset each other and that a rate based on operating income will thus describe the "true" real rate of return. The intention with ROC is thus to measure a real rate of return. This can be compared with a commonly defined rate of return based on historical costs. It is usually constructed to show a nominal rate of return, i.e., no adjustments are made for "inflation losses" due to holding assets in times of a changing price level.

Finally, one additional remark on the construction of rates of return should be made. It concerns the treatment of taxes. Here, no obviously superior alternatives exist. Throughout sections III and IV.2 of this report, we have chosen to recognize only taxes actually paid and thus to consider any deferred taxes as a part of income after taxes and the accumulated deferred taxes as a part of owner's equity. In Part IV.3, we will show the effects of recognizing deferred taxes as expenses and accounting for the accumulated deferred taxes as a liability.⁵

III. THE PERFORMANCE OF SWEDISH BUSINESS GROUPS

III.1 Market rates of return

Let's begin the empirical analysis by looking at market rates of return. We must then turn to entities that are valued at the market, i.e., business groups, and for which market values are observable, i.e., public groups that are listed at the Stockholm Exchange.⁶ We will study all industries except banking. Altogether the least common denominator in Part III is a sample of 45 business groups with a total of slightly more than 600,000 employees out of which approximately 40 percent are employed abroad in foreign subsidiaries. The domestic employment amounts to approximately 40 percent of industrial employment in Sweden. In some analyses we will expand the sample slightly.

Let's start with the stock market performance. In Table 1 are mean values for 5- and 10-year averages.⁷

Table 1. Average five- and ten-year rates of return earned by stockholders in public companies 1946-1978. Percent

	Nominal	Real
<u>Period</u>	<u>Return</u>	<u>Return</u>
1945-49	5.4	3.4
1950-54	18.8	12.9
1955-59	14.3	10.1
1960-64	7.8	4.3
1964-68	6.0	2.0
1969-73	8.5	2.0
1974-78	7.6	-2.5

1945-54	11.9	8.1
1955-64	11.1	7.2
1965-74	6.8	.8
1974-78	7.6	-2.5

If we concentrate on 10-year periods the rate of return was stable during two decades to the mid-1960' and then fell sharply. Behind this pattern, however, lies a more detailed pattern that is revealed if we look at 5-year averages. They indicate an increase at first and then a decrease, starting as early as in the mid-1950's. The performance during the latest decade was the poorest since World War II. In the last 5-year period the real rate of return was even negative.

Let's now turn to the most relevant market description on how the business groups have fared, the return on both debt and stocks (total capital). Conventionally, this rate of return, R , is measured with the help of market data for stocks and bonds, the latter being the measure of debt. The rationale for the use of bond data is twofold. First, there are no other observable market data. Secondly, debts other than bonds are assumed to be of negligible importance.

For Swedish industry, however, debts other than bonds are the dominant type of debt. To accept the bonds as the only measure of the value of debt could seriously affect the validity of the description. The proper alternatives are then to find a way to measure market values on all debts - although no explicit values can be observed - or to drop the idea of measuring total value.

We have chosen the first alternative, because of the availability of the company data necessary. The tool is to find implicit market values on debts from the market and accounting data that exist. This can be done if certain assumptions are introduced. Generally speaking, the market value of debt is defined as the present value of expected future payments where the current market interest rate is used as the discount rate. The assumptions and procedures used in the computations are discussed in the notes.⁸ Of course alternative procedures are possible, but we believe any careful estimates will show the same pattern across time. The data needed for the computations, except the nominal market rate of interest, have been collected from FINDATA, a computerized data bank with data on business groups on the Stockholm Exchange.⁹ It enables us to give descriptions for 1967-78. They are shown in Table 2 where market rate of return for stocks is shown along with market rate of return on total capital - stocks plus debts. We

also give values for the equity-ratio to be discussed below.

Table 2. Market rate of return on stocks and total capital and equity ratio for Swedish business groups. Aggregate figures. Percent.

	<u>Stocks</u>		<u>Total Capital</u>		<u>Equity-Ratio</u>
	<u>Nominal</u>	<u>Real</u>	<u>Nominal</u>	<u>Real</u>	
1966					60.9
1967	7.2	3.8	10.2	6.8	54.9
1968	41.5	39.7	31.3	29.5	59.0
1969	8.6	5.0	6.7	3.1	59.3
1970	-19.6	-26.7	-8.4	-15.5	49.5
1971	25.6	18.5	10.9	3.8	51.7
1972	15.5	9.5	15.1	9.1	49.8
1973	2.1	-5.6	11.5	3.8	43.8
1974	-.2	-11.9	4.4	-7.3	39.5
1975	32.6	21.9	8.7	-2.0	44.5
1976	.6	-9.2	8.5	-1.3	38.4
1977	-15.7	-28.8	-1.9	-15.0	30.0
1978	16.1	8.5	6.8	-.8	33.4
Average	9.5	2.1	8.7	1.2	51.2
Slope (in percentage points per year)	-1.06	-1.84	-.92	-1.70	-.49

The downward sloping trend in real rate of return is clear for both stocks and total capital. Using the periods from Table 1 it could also be illustrated by five-year averages. For real rate of return on stocks it was .1 and -3.9 for the periods 1969-73 and 1974-78 respectively.¹⁰ Correspond-

ing figures for rate of return on total capital was .9 and -5.3. The rate of return was negative for all of the last five years.

Behind the similar development for stocks as compared to total capital is a decline in real rate of return on debts similar to that for stocks. For the period 1974-1978 it was -5.5 percent as an average compared to 2.6 percent during the period 1969-73. A main reason for this poor performance for debts is the slow rate of adoption of nominal interest rates to increased inflation.

Parallel to the decline in rates of return, there has been a decrease in the equity-ratios (stocks as a percentage of total capital). The empirical evidence thus far on changes in equity-ratios have shown a decreasing trend since the mid-1960's but has been based on accounting data (1, 3, 15; see also later in this report). Table 2 shows a decline in the ratio also when market values are used.

III.2 Accounting Rate of Return

The purpose of this section is to see whether the accounting information published by business groups (i.e., their consolidated financial statements) reveals the same picture of trends in performance as the market data in the previous section. We will use accounting data as they are published in annual reports and thus data based on historical costs. Any other kind of data, i.e. based on current costs, are not available for other years than the most recent ones. We will look at exactly the same sample of companies, for the same period, 1967-78, and use the same set of data, i.e. FINDATA, as in the analysis of market rate of return on total capital in the previous part. We will make the analysis in both nominal and real terms - the difference being the rate of inflation. Also, we will only look at the aggre-

gate.

Three measures are of concern:

R_{Tt} = Rate of return on total capital after taxes

$R_{Et,AT}$ = Rate of return on owners equity after taxes

$(E/T)t$ = Equity-Ratio

The second variable is supposed to be the accounting counterpart to the market performance of stocks. It is defined as income after taxes, where taxes are interpreted as excluding deferred taxes. The owners' equity is measured in consequence with this (cf. Section II). In the income calculation, depreciation over the economic life of assets is used rather than depreciation charges allowed for tax purposes.

The rate of return on total capital is based on a capital concept that is supposed to correspond to the concept used in the previous section. It is defined as interest-bearing debt plus owners' equity.¹¹ The income concept is thus defined as income after taxes (as used in $R_{E,ATt}$) plus interest expenses.¹²

The nominal rates of return defined in the way discussed can be viewed as approximations for nominal rates based on current costs. By deducting the rate of inflation we are approximating real rates of return.¹³ We are probably understating the current-cost-based real rate of return slightly.¹⁴

The figures are shown in Table 3 along with figures for the equity ratio.

Table 3. Accounting rates of return after taxes and equity-ratio for the aggregate. Percentage figures based on historical costs.

	<u>Rate of Return</u> <u>on Owners' Equity</u>		<u>Rate of Return</u> <u>on Total Capital</u>		<u>Equity-ratio</u>
	<u>Nominal</u>	<u>App. real</u>	<u>Nominal</u>	<u>App. real</u>	
	1966				
1967	7.0	3.6	7.3	3.9	70.7
1968	9.4	7.6	8.8	7.0	69.8
1969	11.6	8.0	10.2	6.6	69.8
1970	9.0	1.9	9.2	2.1	68.0
1971	6.9	-.2	7.8	.7	64.9
1972	7.7	1.7	8.0	2.0	63.5
1973	14.1	6.4	12.3	4.6	63.6
1974	21.2	9.5	17.2	5.5	65.1
1975	11.9	1.2	11.2	1.2	62.9
1976	6.6	-3.2	8.6	-1.2	60.0
1977	3.3	-9.8	7.0	-6.1	56.4
1978	3.7	-3.4	7.4	-.2	54.8
Average	9.4	1.9	9.6	2.2	64.9
Slope (in percentage points per year)	-.20	-.98	.07	-.71	-1.39

The accounting data based on historical costs reveals the same general pattern as the market data, but in a less dramatic way. The pattern is: decreasing real rates of return and decreasing equity-ratio.

If we concentrate on the five-year periods used previously we can observe a decline in average rate of return on total capital from 3.2 in 1969-73 to -.2 in 1974-78. Similar to the analysis of market data, the reduction in real rate of return on owners' equity was more pronounced than the decline in real interest rate; from 3.6 to -1.3 percent as compared to 2.8 and 1.2 respectively for interest rates. The less dramatic decrease in real interest rate is consistent with the inability in historical cost accounting to change the value of debt in response to changes in the inflation rate and subsequent changes in the market interest rate. This causes increasing overstatements of debts (compared to market values) in times of increasing rate of inflation.¹⁵

From an accounting point of view this overstatement might not cause any concern since it might be viewed as consistent with the principle of conservatism. More concern should perhaps expressed in noting that the accounting value of owners' equity increased substantially during the period measured as a ratio to the market value.¹⁶ In this respect we might add that it is the big overvaluation (as compared to market value) of the owners' equity that is the main reason for the much higher equity-ratios in Table 3 as compared to Table 2. The changes over time in the ratio gives, however, a similar pattern as in Table 2.

III.3 Final Remarks on the Performance of Business Groups

An important qualification to the interpretation of the declining rate of return is raised by the question of how the cost of capital has changed over time. Unfortunately, we don't have the necessary tools to make any valid measures (see (12) for a discussion of methods). It seems, however, highly unlikely that the cost of capital could have fallen the way the mar-

ket rate of return has. In the long run, real capital costs should be formed on an international rather than national basis, given relatively unrestricted flows of capital. The evidence suggests stable real costs of capital in the U.S. and other industrialized countries. Even after considering the behavior of the institutional investors that form an important party on the Swedish market (pension funds, etc.), it seems unlikely that real costs of capital can have decreased the way the real market rate of return has. Moreover, there is also a question of absolute standards. Despite what the cost of capital happens to be in a certain period, negative rates of return (cf. the period 1974-78) does not indicate desirable performance of the Swedish industry from a welfare point of view.

Another important tool for analysis of performance is "Tobin's q", the relation between market value of the equity (debts and stocks) and the replacement cost of the companies' assets. We don't have data for an exact computation (since we lack measures of replacement costs) but we can depict the probable pattern over time. It shows a slightly falling q, with levels well below one the whole period 1966-78.¹⁷ Of course, we should not read too much into this because of problems in measuring the components. But one of the implications should nevertheless be clear: it has been far cheaper to acquire new capacity by buying other firms than by buying fresh real assets.

IV. RATE OF RETURN FOR DOMESTIC CORPORATIONS

IV.1 Introduction

The previous part examined Swedish-owned business group. For them market data are available and it was possible to compare their performance on the market with their performance according to the accounting records.

However, a study of Swedish-owned business groups does not tell us how the Swedish domestic industry has performed. By domestic industry we mean operations within the country. This is something else than operations run by Swedish-owned companies. In the latter, operations in foreign subsidiaries are included and operations by Swedish subsidiaries to foreign companies are excluded. The performance as described in Part III might actually be the result of (or despite) the poor (good) performance in foreign subsidiaries of Swedish companies and not due to their domestic performance.

The purpose of Part IV is to measure and discuss the domestic rate of return. By focusing on domestic operations we abstract from the economic entities that are valued on markets where we can observe their values. There simply are no stock markets or other markets for external valuation of domestic operations (except for those cases where the company is solely operating domestically). By definition, if we want to study domestic operations, accounting rates of return are the only available measures of performance. Further, these measures are available for legal entities (i.e., corporations) which will then constitute our sample basis.¹⁸

What are the uses of accounting information for units that by definition are not explicitly valued on any markets? We can see two main uses. First, it seems probable that a market performance valuation - had it been possible to do - would correspond to the accounting information in a similar way as was concluded for business groups in the previous part. Second, and more importantly, accounting rates of return give measures of performance regarding activities over which domestic entities are supposed to have control, coupled with measures of equity ratios they give the basic pieces of information from which corporate decisions on growth supposedly are formed (2).

The main questions to be raised in this part as follows:

- How has the long-run accounting rate of return in domestic Swedish industry developed? And what are the subsequent changes in equity ratios? These questions will be analyzed in Section IV.2.
- How does the descriptions of rates of return and equity ratios change if we
 - a) look at different kinds of rates of return?
 - b) use measures including instead of excluding holding gains?
 - c) utilize data of highest available quality?
 - d) compute taxes including deferred taxes and change the definition of liabilities and owners' equity accordingly?
 - e) use different measures of total capital?
 - f) analyze individual firms instead of the aggregate?

These questions will be analyzed in Section IV.2 (questions (a) and (b) and Section IV.3 (questions (c)-(f)). They are examples of questions that should be asked in most descriptions but that seldom are, the reason being lack of data. But in the Swedish case when looking at corporations the possibilities exist. The second question thus becomes a way of utilizing a comparable advantage with the Swedish data - that of high quality and richness of details.

IV.2. The Long-run Rate of Return

Figure 2 gives before and after tax rates on return on capital, ROC, as it is conventionally defined in macroeconomic studies, i.e., as operating

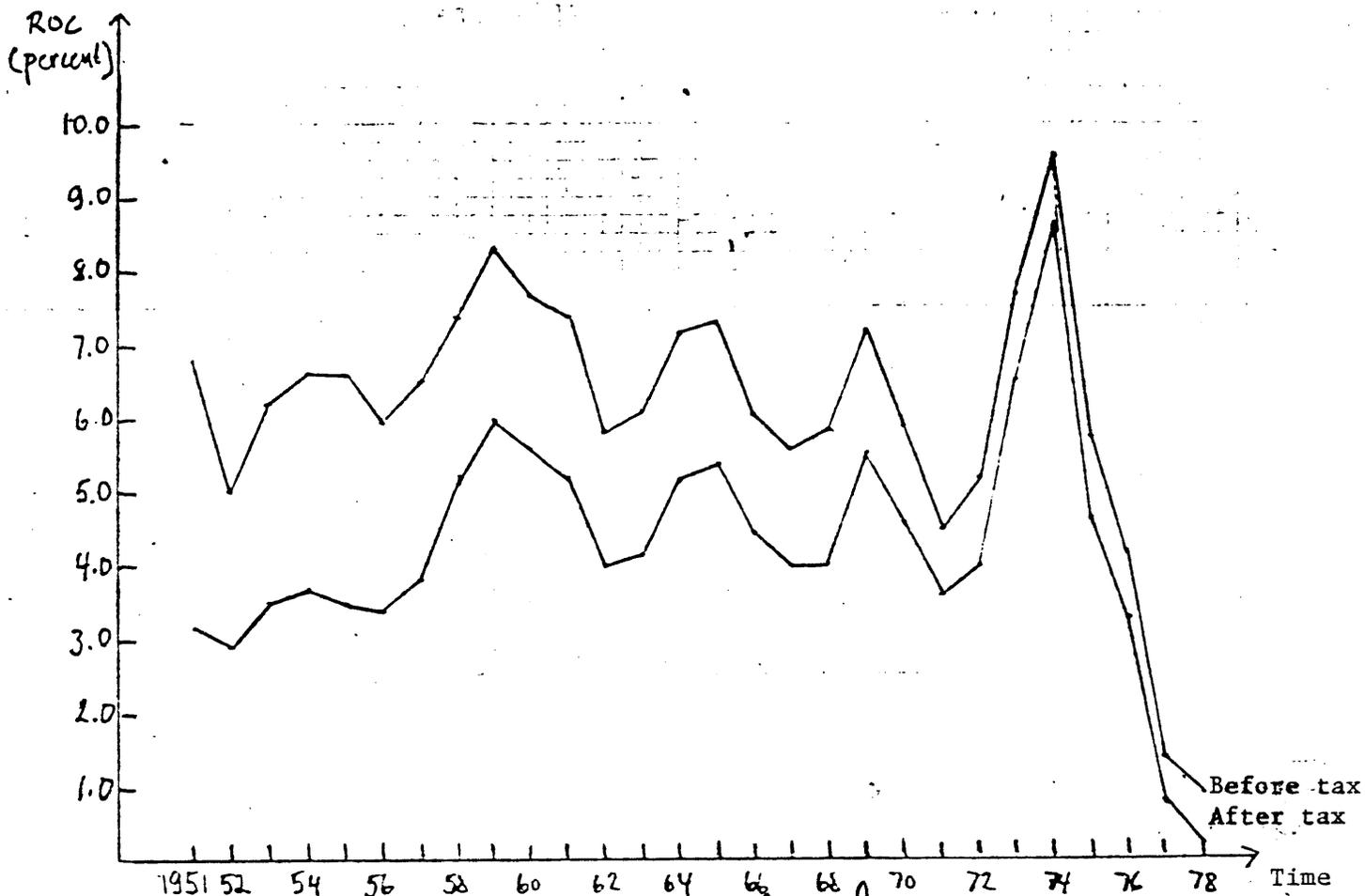


FIGURE 2: Rate of Return on ~~Real~~ ^{physical} Capital
1951-1978

greater than
physical capital

profit - before and after deduction of taxes - as a percentage of depreciable capital stock and inventories. No consideration is given to holding gains/losses or financial income in the profit measure or to investment in working capital or land in the capital measure. This will be done in the next section. The data are primarily collected by the Swedish Statistical Bureau (SCB).¹⁹ Although being of the kind of poor quality that usually characterizes this type of data, it is still the longest backward covering set of data that is available for Swedish industry.

The interpretation of Figure 2 is straightforward: ROC before tax, ROC_{BT} , during the period 1951-78 had a downward sloping trend of .09 percentage points per year. However, because of a falling tax rate (measured as paid-in taxes as a percentage of operating income) over time, the ROC after tax, ROC_{AT} , had a no-sloping trend. Both trendlines are, however, not statistically significant. Behind the general pattern some details should be observed. The 1950's showed increasing rates of return; .116 and .165 percentage points yearly for ROC_{BT} and ROC_{AT} respectively during 1951-60. The turning point to a decreasing trend occurred in the late 1950's or early 1960's.²⁰ The rate of return was then almost stable until the mid-1970's, i.e. -.025 percentage points per year for ROC_{BT} and .030 for ROC_{AT} during the period 1961-76. After 1976 the decline is dramatic - with the after tax ROC down to .2 percent in 1978 - resulting in a decline for the entire period 1961-78 of -.198 and -0.111 percentage points per year for ROC_{BT} and ROC_{AT} respectively. This gives an ample background to the economic problems Sweden presently is facing.

The decline in the tax rate (expressed as a percentage of operating income) has occurred despite an increase in the statutory tax rate. The decline has several explanations, one of them possibly being the introduc-

tion of several possibilities for companies to defer taxes, for example through formation of investment funds from the late 1950's. Another main reason is the decrease in the equity-ratio and the corresponding increase in interest expenses which have reduced the portion of the before-tax ROC chargeable to income taxes. The equity-ratio is shown below in Table 4.

Alternative measures

The main pattern does not change if the measure of profitability is defined as including holding gains or if it is based on a slightly changed income and capital concepts. This can be found by studying Figures 3 and 4, where ROC, including holding gains/losses and R_T , rate of return on total capital are described.²¹ By holding gain/loss we mean the change in replacement costs of the nonmonetary assets (due to changes in specific prices) over the inflation rate, measured as the change in CPI - Consumer Price Index. By R_T we mean return on total capital, i.e. non-monetary and monetary assets together.²² The inclusion of monetary capital in the denominator makes it necessary to add the accompanying income concept - i.e. mainly interests received - to the income concept used in ROC (i.e., operating income). The added income component must be expressed net of holding losses on monetary assets due to inflation, i.e. expressed in real terms (cf. Part II). The alternative measures are based on the same data set as used above.

Let's first consider ROC, including holding gains/losses (Figure 3). The decline in a trendline applied to the data is very similar to that for ROC (Figure 2). For the whole period 1954-78 it is -.075 and -.020 percentage points per year for the before and after-tax measure compared to -.144 and -.023 percentage points respectively for ROC_{BT} and ROC_{AT} . Also the

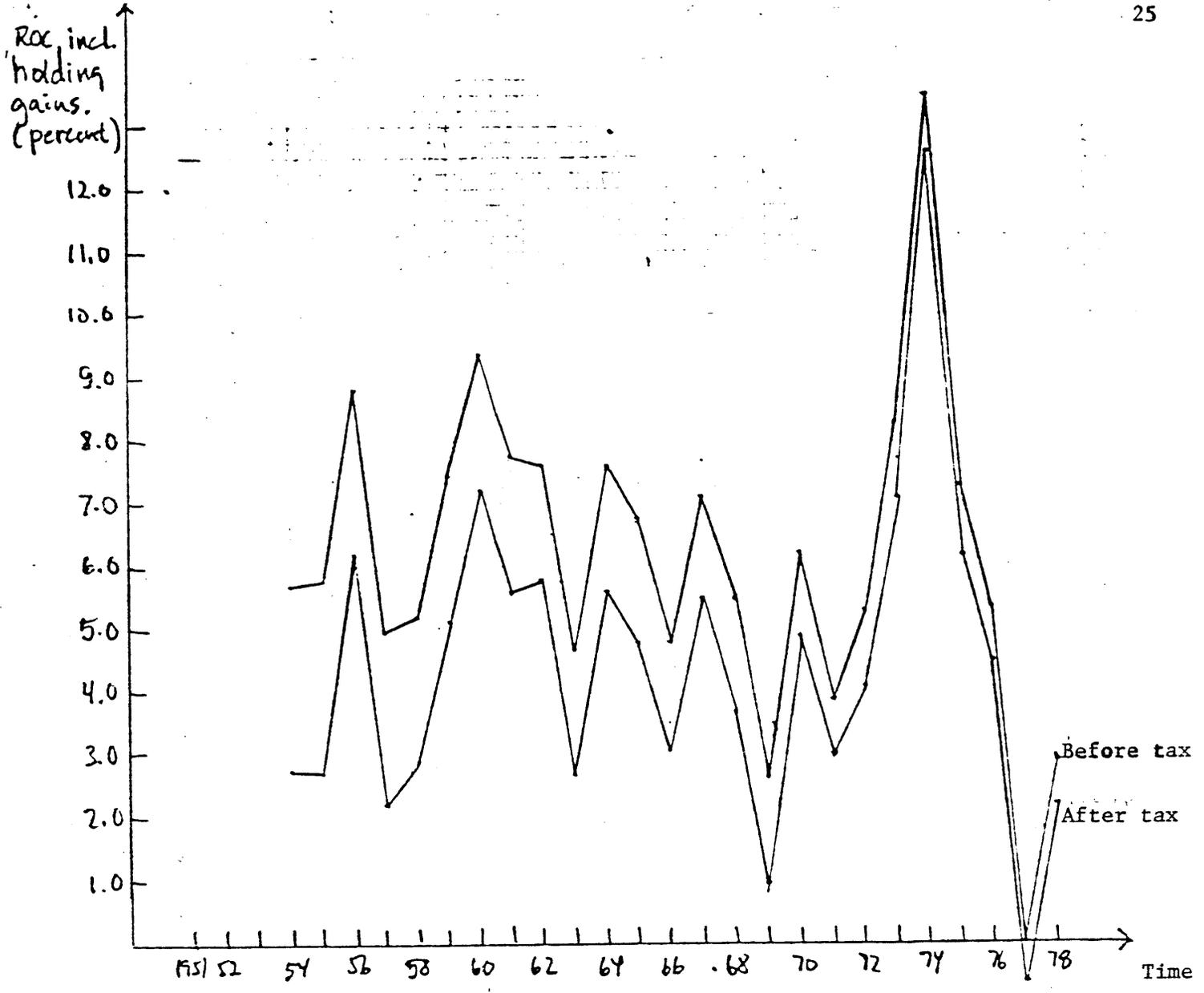
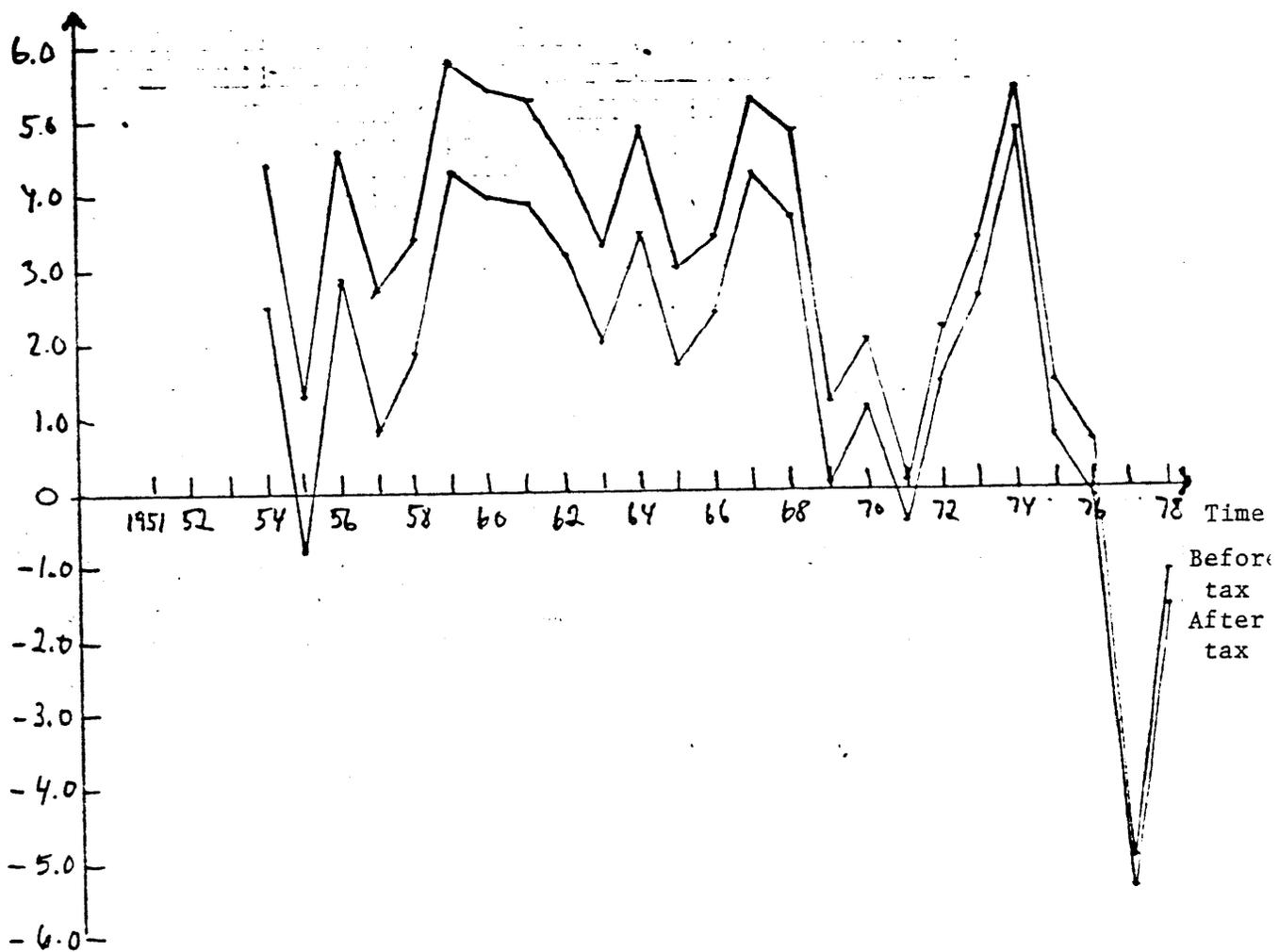


FIGURE 3: Rate of Return on Real Capital including Real Holding Gains and Losses, 1954 -1978

FIGURE 4: Real Rate of Return on Total Capital, 1954-1978

Real R_T
(period)



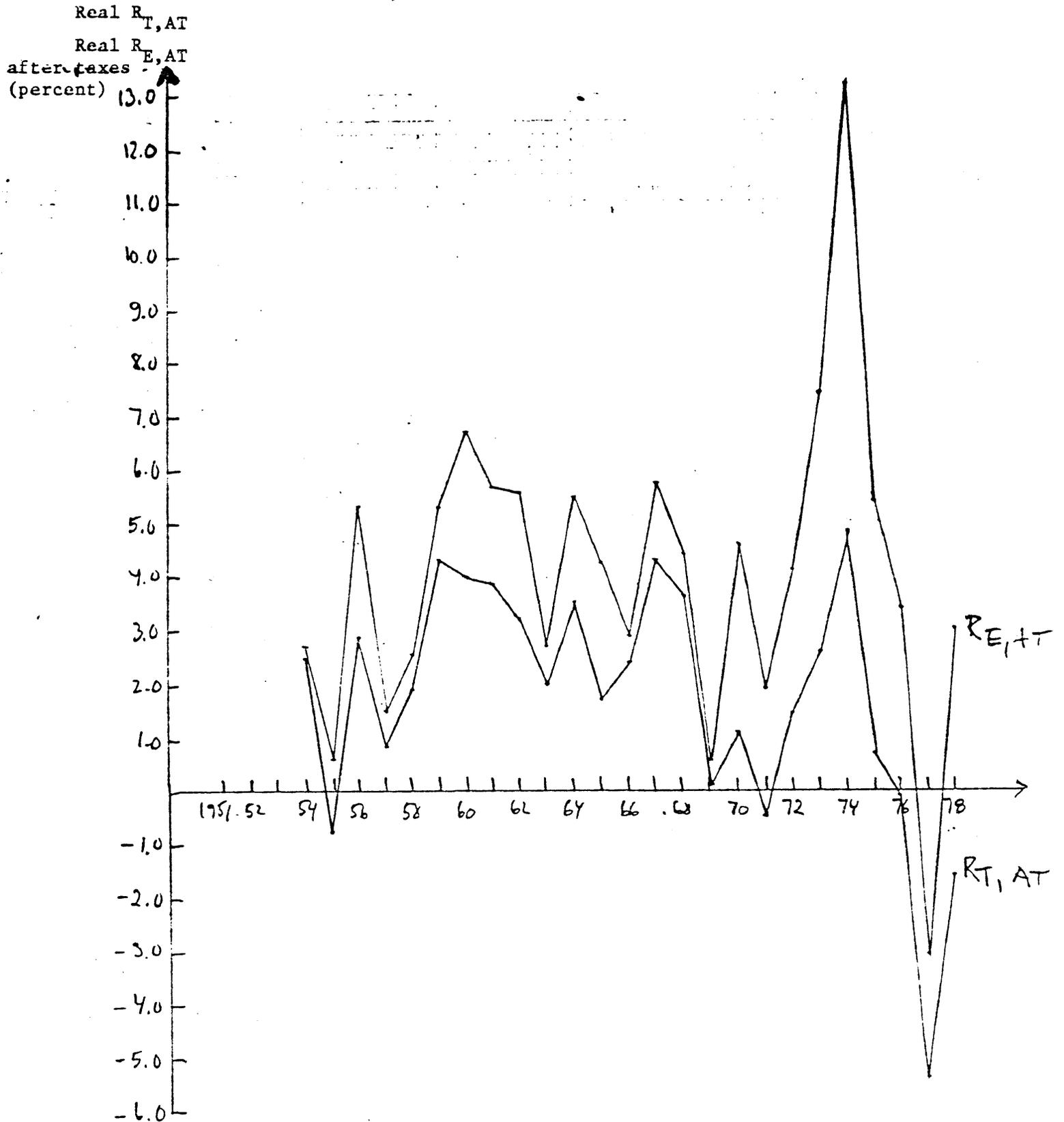
levels of rates of return are similar. The main impact of including real holding gains/losses is that the outcome fluctuates slightly more around the trend line. The methodological conclusion from the comparison between ROC and ROC_T , including holding gains/losses, then becomes, that we could stay with the traditional measure, i.e. ROC, and not bother about holding gain/losses, as long as we are interested in the long-run performance. For short-run descriptions it becomes important to consider the holding gains/losses.

Let's now turn to R_T , the most relevant measure of performance of total capital (cf. Figure 4). Once again, the description of trends becomes similar to those for ROC. For the whole period 1954-78 the trendline declines: -.219 and -.096 percentage points per year for the before and after-tax measure respectively (compared to -.144 and -.023 percentage points for ROC_{BT} and ROC_{AT} , respectively). Compared to ROC including holding gains/losses the yearly fluctuations are smaller - about the same as for ROC.

The methodological conclusion then becomes, that if "performance" is interpreted as ROC, the resulting trend line is slightly less downward sloping than the trendline for the most relevant measure of overall performance, that based on total capital. But this is not the whole methodological picture. In terms of level of rate of return, the R_T is generally lower than ROC. The average level for the whole period 1954-78 is 2.9 and 1.7 percentage points for R_T before and after tax, respectively, compared to 6.1 and 4.4 for ROC. The reason behind this difference is mainly that the real rate of return on monetary capital has been very low. As a matter of fact it has probably been negative during the 1970's.²³

The numbers behind Figures 2, 3 and 4 are shown below in Table 4.

FIGURE 5: Real Rate of Return on Total Capital and on Owners' Equity After Tax, 1954 -78



Income Sharing

Let's conclude the analysis of the long-term performance of Swedish corporations by adding a description of how income has been shared - specifically the real rate of return on owner's equity after tax, $R_{E,AT}$. By so doing we will give the accounting counterpart to the long-term market rate of return on shares described in Part III.2 (although concerning a different business entity - the corporation rather than the business group).

$R_{E,AT}$ is depicted in Figure 5 together with $R_{T,AT}$ (which was also shown in Figure 4). The general pattern for $R_{E,AT}$ is similar to that of $R_{T,AT}$, meaning an increased rate of return during the 1950's (slope = .489 percentage points per year 1954-60) and a declining rate of return since then (slope = -0.070 percentage points per year 1961-78). For the whole period 1954-78, however, the trendline is slightly upward sloping (.026 percentage points per year). We will return to this measure for the entire period, but let's first observe some details. First, the trend during the period 1967-78 (the period used in Part III for descriptions of accounting rates of return and market rates of return on stock and total capital) declined less steeply for $R_{E,AT}$ than for $R_{T,AT}$, i.e. with -.129 percentage points per year compared to -.464. This implies that the real rate of return on debts has fallen even more. The owners of equity have partly been compensated for the decline in real R_T by a bigger decline in real interest rates. This is the opposite picture than the one given for business groups using accounting data (Section III.3) where $R_{E,AT}$ fell more sharply than $R_{T,AT}$. The reason behind this different picture is, however, probably "technical" in the sense that Part III.3 was based on net assets (excluding non-interest bearing liabilities) whilst total capital - and liabilities - are measured gross in this part.

Secondly, the turning point for $R_{E,AT}$ occurred in the late 1950's or early 1960's while it occurred a few years earlier when using market data (cf. Table 1).

Thirdly, the spectacular increase in $R_{E,AT}$ in 1974 deserves some comments. Behind this is a structural change combined with a temporary. The temporary change has to do with changes in the tax system that were made specifically for 1974.²⁴ This helped cause an extraordinary $R_{E,AT}$, since we define taxes as taxes payable. The structural change has to do with changes in the equity-ratio. It decreased from 67 percent in 1954 to 53 percent in 1978 (cf. Table 4, below). Implied in this decrease is higher fluctuations in $R_{E,AT}$, following given fluctuations in $R_{T,AT}$.

When having introduced the equity-ratio in the discussion, let's return to the general pattern for the entire period 1954-78 and some additional comments regarding the relationship between $R_{E,AT}$ and the equity ratio. One way of understanding the almost stable $R_{E,AT}$ (trendline = .026 percentage points per year) as compared to a declining $R_{T,AT}$ (slope = -.096) is to refer to changes in the equity-ratio combined with low or at times negative real rates of return on debts. In other words, a decreasing $R_{T,AT}$ has been "compensated" by an increased leverage. However, the implicit increase in financial risk does not correspond with an increased $R_{E,AT}$ - the rate of return has only been held nearly constant.

The relation between a changed equity-ratio and changes in rates of return should be given an additional comment. It has to do with the implied growth rates. The decrease in equity-ratio was concentrated on the period prior to the 1970's. Thus, it decreased from 67 percent in 1954 to 54 percent in 1969 and was thereafter almost constant, ending at 53 percent in 1978 (cf. however the validity tests in the next section). At the same

time we can observe both $R_{T,AT}$ and $R_{E,AT}$ falling more sharply in the 1970's than earlier after the turning point in the late 1950's. How come? Shouldn't falling profitability correspond to decreased equity-ratio? The answer lies with the real rate of growth in capital. Prior to the 1970's the rate of growth was high enough to result in decreasing equity-ratio despite a comparatively high real rate of return. In the 1970's the growth rate declined to levels where even a decreasing $R_{E,AT}$ couldn't make the equity-ratio fall further.

This is an "economic" explanation behind the changes in the equity-ratio. It should, however, be kept in mind that the analyses in this part is based on data of relatively poor quality. The impact of a switch to data of higher quality will be shown next.

The values for the equity-ratio together with numbers for the variables previously discussed in Part IV.2 are summarized in Table 4.

Table 4
Accounting Rates of Return and Equity Ratio
in Swedish Corporations 1951-78
Aggregate Figures. Percent.

	ROC		ROC incl. real HG/L		Real R_T		Real $R_{E,AT}$	Equity Ratio
	BT	AT	BT	AT	BT	AT		
1951	6.8	3.2	n.a.	n.a.	n.a.	n.a.	n.a.	63
1952	5.0	2.9	n.a.	n.a.	n.a.	n.a.	n.a.	65
1953	6.2	3.5	n.a.	n.a.	n.a.	n.a.	n.a.	66
1954	6.6	3.7	5.7	2.8	4.4	2.5	2.7	67
1955	6.6	3.5	5.8	2.7	1.3	-.8	.6	65
1956	6.0	3.4	8.8	6.2	4.6	2.9	5.3	65
1957	6.5	3.8	5.0	2.2	2.7	.8	1.5	65
1958	7.4	5.1	5.2	2.9	3.4	1.9	2.6	66
1959	8.3.	6.0	7.4	5.1	5.8	4.3	5.3	65
1960	7.7	5.6	9.4	7.2	5.4	4.0	6.7	63
1961	7.4	5.2	7.8	5.6	5.3	3.9	5.7	63
1962	5.8	4.0	7.6	5.8	4.5	3.2	5.6	64
1963	6.1	4.2	4.7	2.7	3.3	2.0	2.7	64
1964	7.2.	5.2	7.6	5.6	4.9	3.5	5.5	63
1965	7.3.	5.4	6.7	4.5	3.0	1.7	4.3	60
1966	6.1	4.4	4.8	3.1	3.4	2.4	2.9	58
1967	5.6	4.0	7.1	5.5	5.3	4.3	5.8	59
1968	5.9	4.0	5.5	3.7	4.8	3.8	4.4	58
1969	7.2	5.5	2.7	1.0	1.2	.1	.6	54
1970	5.9	4.6	6.2	4.9	2.0	1.1	4.6	52
1971	4.5	3.6	3.9	3.0	.1	-.5	1.9	54

1972	5.2	4.0	5.3	4.1	2.2	1.4	4.1	54
1973	7.7	6.5	8.3	7.1	3.4	2.6	7.4	54
1974	9.6	8.7	13.5	12.6	5.4	4.8	13.2	56
1975	5.8	4.7	7.3	6.2	1.4	.8	5.5	54
1976	4.2	3.3	5.4	4.5	.7	-.1	3.4	56
1977	1.4	.8	.0	-.7	-5.0	-5.4	-3.1	53
1978	.9	.2	2.9	2.2	-1.2	-1.6	3.0	53

Averages:

1954-58	6.6	3.9	6.1	3.4	3.3	1.5	2.5	65
1959-63	7.1	5.0	7.4	5.3	4.9	3.5	5.2	64
1964-68	6.4	4.6	6.4	4.5	4.3	3.1	4.6	60
1969-73	6.1	4.8	5.3	4.0	1.8	1.0	3.7	54
1974-78	4.4	3.5	5.8	5.0	.3	-.3	4.4	54
1954-78	6.1	4.4	6.2	4.4	2.9	1.7	4.1	60

b₁ percentage points per year

1951-78	-.090	.001	n.a.	n.a	n.a	n.a	n.a	-.056
1954-78	-.144	-.023	-.075	-.020	-.219	-.096	.026	-.064
1951-60	.116	.165	n.a.	n.a	n.a	n.a	n.a	-.004
1954-60	.289	.443	.382	.525	.386	.489	.668	-.039
1961-78	-.198	-.111	-.120	-.033	-.343	-.285	-.070	-.066

IV.3. Tests of validity.

The last section of the report will be devoted entirely to discussing the validity of the descriptions made in the previous section. We will thereby utilize data of highest quality available. The data set - called "the KKR-bank" - has been established by the Economic Research Institute at the Stockholm School of Economics (EFI) and concern all Swedish corporations with more than 200 employees, i.e., approximately 400 corporations. Together, these companies see almost 70 percent of domestic industrial employment.

The main differences compared to the data used in the previous section are the following:

- a) The object of study is the individual corporation rather than the aggregate.
- b) The data are arranged so as to guarantee a consistent measurement of each year and every company over time. This includes data of equal quality for all companies and all years. It means that "technical" problems, for example mergers, are analyzed and treated in a consistent manner.
- c) For each corporation, individually assigned depreciation rates are used.
- d) Current costs are used as the valuation basis.
- e) In the income measurement, all holding gains or losses are isolated from the operating income. Among other things, this demands not only for current cost data regarding total inventories, but also on the different kinds of inventories, i.e. supplies, work-in-progress and finished goods.
- f) Land is included among the assets. No real holding gains/losses

are recognized on land.

One way of giving an overall picture of the quality and the details in "the KKR-bank" is to mention that for all companies and all years, it includes the same kind of details on current costs, etc., that are required to be disclosed in annual reports by larger U.S. corporations from 1980 according to FASB 33 (8).

The high standards formulated for the data have made it impossible to expand to period of study further back than to 1966. At the same time, the work needed to update the data set is substantial. This has forced us to end the period of analysis in 1976. This means, however, that we will cover the main part of the period characterized by decreasing rates of return. But the two "extreme" years of 1977 and 1978 will be left outside the analyses.

We will concentrate on three variables, $R_{T,BT}$, $R_{E,AT}$ and the equity-ratio. R_T is selected to represent the ultimate choice of variables used for describing overall - independent of the capital structure - performance. It is measured before tax to achieve correspondences with what is customarily done. By including $R_{E,AT}$ we will indicate how the income has been shared. In this case the most relevant measure is after tax. And finally, the equity-ratio is included in order to indicate the changes in capital structure accompanying the trends in profitability.

Our validity analysis will cover two main dimensions (corresponding to questions c-f, on page 20). The first regards the impact on the description of different data sets and different ways of operationalizing variables. The second regards differences between descriptions for the aggregate and for individual firms.

Table 5 summarizes the first dimension. Along with the data and

Table 5

Impact on Measures of Substituting the Data Set and/or
Definitions Used. Aggregate Numbers. Percent.

Year	Real $R_{T,BT}$				Real $R_{E,AT}$			Equity Ratio	
	a) Previously Described	b) Capital Excluding Current Liabilities	c) Deferred Taxes = Liability	d) Previously Described	e) Capital Excluding Current Liabilities	f) Deferred Taxes = Liability	g) Previously Described	h) Capital Excluding Current Liabilities	i) Deferred Taxes = Liability
1966	3.4	6.3	3.6	2.9	3.3	3.6	58	76	43
67	5.3	6.2	4.1	5.8	2.9	3.5	59	75	43
68	4.8	6.1	4.2	4.4	1.9	3.3	58	73	42
69	1.2	7.8	5.0	.6	4.3	4.5	54	72	42
70	2.0	3.1	.1	4.6	-.6	- 1.2	52	71	40
71	.1	3.9	1.4	1.9	.4	.3	54	68	37
72	2.2	5.4	2.6	4.1	3.0	2.4	54	66	36
73	3.4	8.6	4.6	7.4	9.0	6.4	54	65	36
74	5.4	8.8	4.0	13.2	9.0	5.4	56	66	34
75	1.4	3.8	.4	5.5	1.5	.6	54	66	33
76	.7	2.1	-.8	3.4	-.9	-.2	56	64	32
Average	2.7	5.6	2.7	4.9	3.0	2.6	55	69	40
Slope (in percentage points per Y)	-.21	-.17	-.32	.37	.07	-.15	-.31	-1.24	-1.22

measures used in Section IV.2, two alternative measures are given. Both are based on the "KKR-bank." In the first alternative, capital is measured excluding current liabilities (i.e., monetary assets have been defined net of current liabilities; this was not done in Section IV.2). In the second alternative, deferred taxes are recognized as liabilities and tax expenses are defined including the taxes deferred each period. In this case, however, no component has been excluded from the capital.

The first alternative has no implication for $R_{E,AT}$, since owners' equity doesn't depend on whether debts are measured gross or net of current liabilities. The second alternative has no implication for $R_{T,BT}$, since this variable is measured before taxes. This means that by comparing the value for $R_{E,AT}$ computed previously with the value in the first alternative measure, the effect on $R_{E,AT}$ of changing to a data set of higher quality is isolated. The impact of the change on $R_{T,BT}$ is thus found by comparing the original measures with the second alternative measure.

Table 5 can be interpreted as follows: the use of data or higher quality will cause the picture of a declining $R_{T,BT}$ to become even more outspoken (cf. Columns a) and c)). As should be expected, this is then also the case for $R_{E,AT}$ - and to a greater extent (cf. columns d) and e)). The detailed reasons behind this have previously been discussed in (4)²⁵ and will not be outlined here.

Further, a change of definition of capital has little effect on $R_{T,BT}$ other than that the level of rate of return of course becomes higher when we change to a capital concept corresponding to smaller amounts (cf. columns a) and b)). And if the definition of $R_{E,AT}$ is changed with respect to the treatment of deferred taxes (treated as liabilities instead of owners' equity), the $R_{E,AT}$ will look more gloomy (cf. columns d) and f)).

As to the combined effect on the equity-ratio of the use of data of higher quality and of changes in definition, Table 5 gives clear indications: the decrease in the equity-ratio becomes more accentuated.

The general conclusion thus becomes: the use of data of higher quality does not contradict the conclusions previously drawn on falling trends in rates of return. On the contrary.

Behind the general pattern, substantial differences can occasionally be found between different measures for specific years. Let us only pinpoint one difference, namely regarding $R_{E,AT}$ in 1973 and 1974. Recall the spectacular outcome of $R_{E,AT}$ in 1974 according to Figure 5. When data of higher quality are used, the outcome for 1974 is not as spectacular any more - although still high - and it is not higher than 1973. If the definition is changed so as to include deferred taxes among the liabilities, the outcome for 1974 even becomes lower than 1973. The implication of this is that great caution should be exercised when basing decisions on relatively poor aggregate data. For further discussion on this topic, see (9).

Our final test of validity concerns a comparison between measures for the aggregate and measures for individual firms. This is done in Table 6 where the aggregate numbers based on the best available data ("the KKR-bank") are compared with the value for the median firm based on the same data. To indicate the dispersion within the aggregate 25- and 75-percentiles are also given. The variables selected are $R_{T,BT}$ and $R_{E,AT}$ defined in the way used in Section IV.2. (The aggregate figures thus correspond with the figures given in Table 5, columns c) and e), respectively.)

As can be seen in Table 6, analyzing the median firm instead of the aggregate gives a slightly changed picture. The average values are lower and the slope of the trendlines are more negative (decreasing). This indi-

Table 6

Comparison Between Measures for the Aggregate and for Individual Firms. Percent.

Year	Real $R_{T,BT}$				Real $R_{E,AT}$			
	Aggregate	Median	25-percentile	75-percentile	Aggregate	Median	25-percentile	75-percentile
1966	3.6	3.1	-.2	8.1	3.3	2.1	-3.5	9.9
67	4.1	4.2	1.3	8.0	2.9	2.6	-2.7	10.1
68	4.2	3.5	-.4	8.5	1.9	.7	-6.6	9.3
69	5.0	3.7	.3	7.6	4.3	2.3	-4.5	9.4
70	.1	-.4	-4.2	3.0	-.6	-1.4	-9.1	5.4
71	1.4	.8	-2.0	4.1	.4	-.9	-8.4	5.7
72	2.6	2.7	-.6	6.2	3.0	3.3	-3.6	10.1
73	4.6	4.0	.2	8.2	9.0	8.1	1.2	16.5
74	4.0	2.3	-2.1	7.8	9.0	6.8	-1.5	17.7
75	.4	-.4	-4.6	3.5	1.5	.0	-8.8	6.6
76	-.8	.0	-5.3	3.8	-.9	.6	-10.3	8.3
Average	2.7	1.9	-1.6	6.3	3.1	2.2	-5.3	9.9
Slope (in percentage points per year)	-.17	-.31	-.46	-.34	.07	-.24	-.39	.20

cates that bigger (in terms of capital employed) companies have fared better than smaller ones. An analysis of ROC indicates that this is not due to bigger real holding gains but rather has to do with differences in relative operating profitability.²⁶

The data thus suggests that looking at individual firms does not change the general conclusion of falling trends in profitability. On the contrary, it shows bigger declines. By looking at the dispersion around the medians, some indication as to the changes in financial risks accompanying the decreased-ratio can be found.²⁷ The pattern is: approximately even dispersion (measured as the difference between the 25- and 75-percentiles) around the median with respect to $R_{T,BT}$ and increasing dispersion with respect to $R_{E,AT}$. In the latter case, the increase has been followed by a decreased rather than an increased median value. This picture gives arguments for the hypothesis that the period studied has seen increasing financial risks following the decrease in equity-ratios and that the increase in financial risk has not been followed by reducing operating risks (the risk with respect to R_T), thus indicating increased business risks (the risk with respect to $R_{E,AT}$). This conclusion is not contradicted by a common sense analysis of increased price turbulence, shorter lives on assets, increased rate of inflation, etc., that characterize the 1970's as compared to previous decades.

This is not the place to go into further detailed analysis of company data. Let us instead finish the discussion with the general remark that the differences between the aggregate and the median firm as well as the wide distribution around the median value should foster great caution when basing analyses on aggregate data: this is true for all kinds of measures of profitability and refers to descriptions of long-term trends as well as

analysis of changes from year to year and absolute levels for individual years.

FOOTNOTES

1. The figure and the discussion is based on the assumption that total capital is defined excluding non-interest-bearing liabilities. By "debt" is thus meant interest-bearing liabilities and by "non-monetary assets" monetary assets less non-interest-bearing liabilities. The reason for this "net approach" is its convenience in economic analysis.
2. The difference between depreciation (or costs of goods sold) measured at historical costs and measured at current costs equals realized holding gains/losses.
3. The degree of approximation depends on many factors, including lives of assets, growth rate, the manner in which specific prices increase over time and asset structure. Great caution should be exercised when using historical costs as a basis for descriptions over time. See also note 14.
4. If the income concepts in Figure 1 are to be expressed in real terms the holding gains/losses on nonmonetary assets must be expressed net of inflation (i.e., as a function of relative changes in prices). Further, financial income should be expressed net of losses due to holding monetary asset during times of inflation. In the same way interest expenses should be expressed net of "inflation gains" on debts. This leaves a real income after tax that equals the nominal income after tax - based on current costs - less "inflation loss" on the owner's equity. Cf. (8) and (10).
5. The reason for the treatment of taxes in the manner indicated is mainly due to pedagogical reasons. The Swedish corporate tax system is com-

paratively "liberal" in that it gives the firm many different opportunities to postpone tax payments. Writing down on inventories, accelerated depreciation techniques, different kinds of investment funds are the main examples. It has been shown very difficult to describe the special features of the Swedish tax system to an international forum not specifically interested in the taxation of firms. "Economic" arguments for concentrating on actually paid taxes can easily be raised but the perhaps most crucial argument in this report is that of avoiding a difficulty that is mainly Swedish.

6. We will concentrate on companies on the so-called "A-list" at the Stockholm Exchange.
7. The values for the period 1945-1964 are collected from (11) and concern groups listed at the Stockholm Exchange all years 1946-64 (80 companies). The data for subsequent periods are collected from (14) and concern companies listed all years during the periods, respectively. The number of companies covered the final period, 1974-78, is 81.
8. We define the aggregate market value of debts at the beginning of period t , $M(L_t)$, as:

$$M(L_t) = E(I)/i_t, \text{ where}$$

$$E(I)_t = \text{Expected interest earned}$$

$$i_t = \text{Nominal market rate of interest}$$

The simple formulation implies an infinite rather than finite income stream. The fact that loans are repaid is thus - for the aggregate - viewed as a tool for changing nominal rates over time rather than as reflecting an intention that the lending is to be abandoned.

The formulation further implies that the expected interest earned is constant over time. The expectation concerns interests earned on

loans given at a specific point in time, t , but is nevertheless not a true description of actual expectations. However, fluctuations in interests earned over time are a function of fluctuations in the market interest rate. At a specific point in time, the interest rate is i_t and the expectations derived from that interest are given and assumed constant, $E(I)_t$.

As to the actual measurement of the components, i_t is perhaps the most difficult one. Generally speaking, i_t is the (weighted) average of the market rate on the "bank loan" market and the bond market. These rates change over time and differ between companies and between loans to the same company (due to the risk involved). What we can observe are rates required by the market for the loans actually given. Due to different kinds of regulations, the differences in risks are, however, mainly accounted for by other means than by differences in interest rates - leaving very small differences in interest rates between companies and between markets. We will therefore use the market interest rate on long-term industrial bonds as the base for our measure of average market rate on all debt. To account for the higher interest rate normally required on other types of loans, we have added two percentage points to the bond rate.

The expected interest earned consists of two main parts. The first regards loans where the face interest rate is given and constant over time. Examples are bonds and some bank loans. Expected interest earned on these loans can be computed by the market with a very high degree of accuracy. The second part regards loans where the face interest rate changes over time. These fluctuations reflect changes in the market interest rate. At the beginning of period t , this market inter-

est rate is i_t and the expected interest earned during period t becomes a function of i_t . Since i_t only takes one value for the aggregate also the second part of the expected interest earned can be computed with a high degree of accuracy.

There is one problem, however. We don't know the relative weight of the two components. The solution we have selected is therefore to define $E(I)_t$ as the actual interest earned during the period, I_t . As the first part in $E(I)_t$, it is also included in I_t . The difference between $E(I)_t$ and I_t becomes a matter concerning the second part and thus a function of changes in the market interest rate within period t . In addition, there is a variance due to interest on new net borrowing. Both variances are presumably small compared to I_t and should not interfere too much with the validity of long-term descriptions.

Finally, in order to simplify the computations, let's assume that all retirements, A_t , and issuance of new debts, N_t , is being made at the end of the period, implying that the recorded interest expenses should be interpreted as the interest expense for the liabilities, L_t , at hand at the beginning of the period. Then, the market rate of return on debt, $R(L)_t$, can be expressed as:

$$R(L)_t = (M(L_t) - M(L_{t-1}) - (N_t - A_t) + I_t) / M(L_{t-1}).$$

9. FINDATA is managed by the Economic Research Institute at the Stockholm School of Economics.
10. These figures differ slightly from the figures in Table 1 for three reasons: First, the averages in Table 2 are computed from yearly rates of return. Secondly, Table 2 regards the aggregate (weighted average) while Table 1 regards the unweighted average. Finally, Table 3 concerns business groups listed on the Stockholm Exchange during all years

- 1966-78 (45 companies) while Table 1 includes companies listed for shorter periods. Cf. footnote 7.
11. The interest bearing debts are not separated in FINDATA since annual reports seldom make the distinction between interest bearing and non-interest bearing debts. The figures have been computed by applying the ratio of interest bearing debts to all debts (excluding deferred taxes) for each year for Swedish corporations (as described in another data set, "KKR-bank"; cf. Section IV.3).
 12. This means that $R_{T,AT}$ is defined as "income to be shared" (see Figure 1) less taxes paid or accrued (but exclusive of deferred taxes). With $R_{T,BT}$ (i.e., before taxes) given and by definition independent of the equity-ratio this makes $R_{T,AT}$ become a function of the equity-ratio. The lower the ratio - ceteris paribus - the higher the interest expenses and the lower the taxes (since interest expenses are deductible when computing taxes) and thus the higher is the sum of interest expense and income after taxes. This is consistent with those lines in financial theory that hold that the value of the firm is dependent on the capital structure via the tax impact. Cf. for example (5) and (7). The alternative to this approach - thus making the return after tax independent of the equity-ratio - would be to add an "interest after company taxes" - concept to income after taxes when computing the numerator. This is frequently done but means a severe suffering of common-sense interpretation of the income concept.
 13. Compared to a correctly measured real rate of return - i.e., based on current costs - change in unrealized holding gains/losses (measured in real terms) is missing in the numerator and accumulated unrealized holding losses/gains are missing in the denominator.

14. In a study of the approximately 400 largest Swedish corporations for the period 1966-76 (cf. Part IV.3), the aggregate values for real rates return on owners' equity, based on current costs, was mostly understated by parts of a percentage point during the early part of the period (1966-71) when historical costs were used. When the rate of inflation increased during the latter part of the period (1972-76), the understatement increased to an average of slightly above one percentage point. The understatement was especially high - as one should expect - when the inflation rate increased, but was reduced when the inflation rate was stabilized - even if it was at a higher level.

The understatement of real return on total capital was slightly smaller.

It should be noted that the mentioned variances concern rates of return defined slightly different than what is used in the present context.

15. Measured as a percentage of book value, the market value of debts decreased from 97.2 percent in 1966 to 83.9 percent in 1978.
16. The market value of stocks was 49.7 percent of the book value of owners' equity - as measured in Table 3 (i.e., including deferred taxes) - in 1966 and decreased in 39.2 percent in 1978.
17. The relation between market value and historical cost of total equity was .61 in both 1966 and 1978. The relation between historical cost and replacement cost should, however, be falling during the period due to increasing rate of specific price increases. This would mean a falling q .
18. Some legal units might have operations abroad that are not run in the form of subsidiaries and that consequently will be included in the

corporations studied but that should be excluded if domestic operations were to be operationlized literally.

19. The data in Part IV.2 has most kindly been made available by Jan Soldersten at the University of Uppsala.
20. To pinpoint the turning point is partly a matter of taste: should it be set before or after the peak of the business cycle (1959), i.e. should i be set at 1958 or 1960. We have chosen the latter alternative.
21. In Figures 3 and 4, no descriptions for the years 1951-53 are made. This is due to lack of data.
22. Land is excluded becuae measures are not available in the data set used. Cf. (1). Monetary assets are measured gross, i.e., non-interest-bearing liabilities (or, alternatively, short-term liabilities) have not been deducted from the monetary assets. This makes the capital measure higher, ceteris paribus, than the one used in Psrt III. 3. See also Part IV.3.
23. When interpreting the difference between R_T and ROC it should be held in mind that the capital concept used in R_T includes the gross monetary assets. Cf. note 22.
24. Following the price turbulance and increase in the rate of inflation that accompanied the "oil shock" in 1973 came very high nominal accounting profits reported by companies in 1974. In order to prevent temporary windfall gains to be taxed, special rules were enforced to lighten the tax burden. This resulted in the lowest effective tax rate (taxes payable as a percentage of operating income) ever experienced during the previous or following parts of the period under study.
25. In (4), the focus for comparisons was the kind of data used in Section IV.2 of this report on the one hand, and the kind of data used in Sec-

tion IV.3 on the other hand. The comparison was initiated by an article on rates of return, based on the first kind of data (1). The numbers presented in that article do, however, differ from the numbers presented in Section IV.2 of this report. The reason for this is that in computing the numbers used in this report, separate indices for building and machinery have been used whilst a weighted index was used in (1).

25. The average ROC during 1966-76 for the aggregate was 3.8 percent and for the median 2.6 percent. For ROC, including holding gains/losses it was 4.3 and 3.2 percent respectively.
26. One shouldn't uncritically confuse expected distribution of outcomes for one firm - it is in this context risk concepts should be defined - and the distribution of actual outcomes for many firms. The arguments formulated, however, rest on the assumption that bigger dispersion of outcomes between firms is a sign of bigger dispersion of expected outcomes for each individual firm.

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