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Nr. 66

On the Rate of Return
in Small and Medium-Sized Manufacturing Firms
in Germany 1968 - 1977

by

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Paper presented to a meeting of the project "International Comparison of Rate of Return" in London on April 2-4, 1979.

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1. The Problem

In the literature on the rate of return judgments are often formed without addressing the problems of measurement and comparability in detail. This may lead to conclusions which would not have been reached if the problems of measurement and comparability had been noticed. These problems are of special importance when the rate of return in small firms is considered and used for comparisons with larger firms. If an analysis of rates of return includes financial statements of small German firms at least four facts must be considered:

1. The definition of profit in the tax laws depends upon the legal basis of the firm. Single traders ("Einzelkaufmann") and partnerships in trade ("Offene Handelsgesellschaft", "Kommanditgesellschaft") must refer to the personal income tax law ("Einkommensteuergesetz") - resulting in a general non-deduction of all amounts paid to the owners. For instance, the salary of a managing owner cannot be deducted as costs. On the other side, limited companies ("Gesellschaft mit beschränkter Haftung") and stock corporations ("Aktiengesellschaft") relate to the corporation income tax law ("Körperschaftsteuergesetz"). Here, the salary of a managing owner can be deducted as costs. It is quite clear that a comparison of rates of return should not overlook such differences in cases where small firms are included.
2. The limited companies and the stock corporations show their profit figures on an aftertax basis while the other firms mentioned above usually report on a before-tax basis. Comparisons of rates of return can only be made using comparable profit figures.

3. Assuming that the two facts above have been noticed - there is another fact requiring correction. A single trader and a partner with full liability within a partnership in trade, both bear the risk that their non-firm private property may be taken up by the firm's creditors. Thus these people require an additional risk premium as part of the profit obtained.
4. The German Stock Corporation Law ("Aktiengesetz") still allows the application of weaker valuation methods than German fiscal authorities demand for the calculation of taxes under the corporation income tax law. Though the decline of profit rates in the past years should have diminished the hiding of reserves, in practice there usually exist two different financial statements of a stock corporation. Because single traders, partnerships in trade, and limited companies generally are not obliged to publish their financial statements these firms only produce one type of financial statement - on the basis of the demand by the fiscal authorities.

At least the consideration of the first three points mentioned above is necessary to insure proper comparisons. Several investigations have been published without regarding these facts in an explicit manner [e.g. (1, p.16), (3), (4), (5), (6), (8))]. There is the danger that such investigations state a profitability of small business in Germany that does not exist in reality.

It is the purpose of this study to demonstrate the effects of proper comparisons on the resulting profitability figures [see also the approaches in (7) and (9)]. It is not intended to compute real rates of return in our study. All the computations aim at rates of return expressed by nominal values.

The material gives some insight into the effects of size on profitability, too. It will be shown that the seeming higher profitability of small firms is due to two factors: (1) accounting behaviour and (2) non-compensated singular firm factor.

2. The Data

The effects of a correction of the financial statement figures are demonstrated by unpublished data which are collected annually by the Chamber for Industry and Commerce in the city of Kiel. The Chamber questions more than 150 firms per year to obtain these unpublished financial statement figures. At the Institut für Betriebswirtschaftslehre of Kiel University we evaluate these data annually. Our institute does not know the names of the individual firms, we only obtain additional information on the legal firm base and on the industry group.

From these data all firms have been taken for this study where data were available for the whole period from 1968 to 1977. The resulting number of firms excluded those reporting a sales figure of more than 100 million DM in 1977 and those having more than 1000 employees. Thus we include firms of such a size that may be connected with a crisis in company growth according to Albach (1). The remaining 55 firms are tabulated by the two size measures - see Table 1 [additional material on size distributions is given in (14)].

All the firms studied belong to the industrial sector, i.e. they are investment and consumption goods manufacturers.

Table 1:

1977 Size Distributions of 55 Small and Medium-Sized Firms

- Measures: Employees and Sales -

<div>Sales (DM)</div> <div>Employees</div>	Up to 1 million	1-5 mill.	5-10 mill.	10-50 mill.	More than 50 mill.	Total
1 - 19	6	2				8
20 - 49		3	4			7
50 - 99		5	9	1		15
100 - 299		1	3	13	1	18
300 and more				4	3	7
Total	6	11	16	18	4	55

3. The Correction of the Rate of Return

From the data mean rates of return on sales and on total capital have been computed - all computations were carried out by the PDP-10 of the computer centre at the University of Kiel. The results are presented in Tables 2 and 3. From these tables it can be seen that there has been a decline in profit rates since 1968, but this decline is not as strong as reported elsewhere [see for instance (12)]. This statement caused us to examine the correctness of the results reported in Tables 2 and 3. The initially stated problems require corrections that shall be described now.

A problem arises with respect to the non-availability of a tax figure for the limited companies included. This is due to the questionnaire which did not ask for the tax position. Thus the taxes must be estimated by an proportional addition to the profit after tax figure for these type of firms. We assume that the tax burden of the limited companies is like that of the stock corporations.

Because the single traders and partnerships in trade report their profits on a before-tax base we decided to convert the results for the limited companies (row 1 in Tables 2 and 3) by adding the mean tax figure for German stock corporations to the figures of the row 1 in question. Comparisons between Table 2 and Table 4 and between Table 3 and Table 5 show the effects in row 1 of these tables.

Important corrections must be carried out for the single traders and partnerships in trade (see row 3 in Tables 2 and 3). Referring to the facts - reported when formulating the problem - we tried a correction on a simulation basis: Two situations (I and II) were assumed, their characteristics are as follows with respect to two influencing factors.

Table 2:

Mean Rates of Return on Sales 1968 - 1977 (Percent)

- Based on Original Figures without Corrections -

Row	Group of firms	Number of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	Limited companies (GmbH)	15	2.6	4.7	3.7	2.0	4.4	4.0	2.0	1.5	2.5	2.1
2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	6	8.2	9.1	8.4	5.0	5.0	3.1	0.9	-1.0	-1.7	2.9
3	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	34	6.3	6.4	7.3	6.0	5.7	5.1	5.7	5.6	5.2	6.1
4	All firms	55	5.5	6.3	6.4	4.8	5.3	4.5	4.1	3.7	3.7	4.6

Table 3:

Mean Rates of Return on Total Capital 1968 - 1977 (Percent)

- Without Corrections -

Row	Group of firms	Number of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	Limited companies (GmbH)	15	6.8	10.2	8.5	6.5	10.0	10.6	7.4	5.5	7.1	5.9
2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	6	17.8	19.1	18.5	10.9	9.7	7.8	4.4	0.6	0.1	8.3
3	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	34	18.3	18.4	20.8	14.8	16.4	14.6	17.9	17.2	18.3	19.1
4	All firms	55	15.1	16.2	17.2	12.1	13.9	12.8	13.6	12.2	13.3	14.3

First, an assumed salary for managing owners was deducted from the profit figure. This salary was varied with respect to the size-class of the individual firm investigated. The base for 1977 is given below:

Employees	Salary for managing owner	
	Situation I	Situation II
0 - 19	40 000 DM	60 000 DM
20 - 49	55 000 DM	82 500 DM
50 - 99	70 000 DM	105 000 DM
100 - 299	85 000 DM	127 500 DM
300 and more	100 000 DM	150 000 DM

The salaries were computed backwards, starting with the above 1977 salary. For the years 1968 through 1976 the salary was assumed to rise by the same percentage, year by year, as the mean personal expenses of the individual firm.

Second, the full liability of a managing owner was taken into account by subtracting a risk premium because of the possibility that creditors could claim the private non-firm property. This premium was set as follows:

Risk premium for full liability	
Situation I	Situation II
0.5% of total assets	1.0% of total assets

A risk premium because of full liability also was computed for the partnerships in trade with a limited company as the partner with full liability. In these firms a salary for the owning manager can be deducted as costs so that any additional deduction of salary cannot be justified.

The tax figures for the limited companies include taxes on yield and net assets. Therefore, the figures of the single traders and the partnerships in trade had to be increased by an estimate of these taxes. By this correction the computed rates of return before taxes are comparable with results reported elsewhere.

As a result, Tables 4 and 5 report comparable return figures eliminating the differences due to the legal basis of the firm. The stated decline is much sharper when going from the original data to situation I (rows 1 to 4) than to situation II (rows 5 to 8). It seems to us that the managing owners of the studied firms earn proper salaries and risk premiums only with respect to the return on total capital, not with respect to return on sales.

Table 4:
Corrected Mean Rates of Return on Sales
before Taxes 1968 - 1977 (Percent)

Row	Correction	Group of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	A	Limited companies (GmbH)	3.9	5.9	3.4	2.5	6.5	5.1	4.9	4.8	2.7	5.7
2	B1	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	9.3	10.4	9.6	5.6	5.6	3.5	1.2	-1.0	-1.4	3.4
3	C1	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	5.1	5.4	6.5	5.1	4.8	3.7	4.4	4.4	3.9	4.7
4	-	All investigated firms	5.3	6.1	6.0	4.5	5.3	4.1	4.2	3.9	3.1	4.8
5	A	Limited companies (GmbH)	3.9	5.9	3.4	2.5	6.5	5.1	4.9	4.8	2.7	5.7
6	B2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	9.0	10.1	9.3	5.3	5.3	3.2	0.9	-1.3	-1.6	3.1
7	C2	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	3.7	4.1	5.4	4.0	3.6	2.4	3.1	3.1	2.7	3.4
8	-	All investigated firms	4.4	5.3	5.3	3.7	4.6	3.2	3.3	3.1	2.3	4.0

Table 5:

Corrected Mean Rates of Return on Total Capital
before Interest and Taxes 1968 - 1977 (Percent)

Row	Correction	Group of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	A	Limited companies (GmbH)	8.8	12.2	8.2	7.5	13.6	12.9	13.0	11.0	7.8	12.4
2	B1	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	20.1	21.5	20.8	11.9	10.7	8.5	5.0	0.7	0.7	9.2
3	C1	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	15.0	15.7	19.1	13.0	14.3	11.5	15.4	15.1	15.9	16.3
4	-	All investigated firms	13.9	15.4	16.4	11.4	13.7	11.6	13.6	12.4	12.0	14.5
5	A	Limited companies (GmbH)	8.8	12.2	8.2	7.5	13.6	12.9	13.0	11.0	7.8	12.4
6	B2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	19.6	21.0	20.3	11.4	10.2	8.0	4.5	0.2	0.2	8.7
7	C2	Single traders and partnership in trade (Einzelkaufmann, OHG, KG)	11.5	12.6	16.5	10.8	11.7	8.7	12.7	12.6	13.2	13.4
8	-	All investigated firms	11.8	13.5	14.7	10.0	12.1	9.9	11.9	10.9	10.4	12.7

4. Factors Influencing the Profitability of Small and Medium-Sized Firms

The inspection of Tables 4 and 5 could lead to the conclusion that small firms - managed by the owners - are somewhat superior to medium-sized firms - managed by occupied managers - . But a more accurate investigation of the small firms showing high profitability figures resulted in the following¹⁾. There are two quite different factors leading to very high profitability figures:

1. accounting behaviour factor
2. non-compensated singular firm factor.

The accounting behaviour factor is evident by the following facts:

- hidden reserves in land and buildings
- removing privately owned land and buildings from the balance sheet
- showing high debt ratios, the firm being a subsidiary company to a larger firm.

This accounting behaviour factor is of special importance in the case of small firms because such firms are using few pieces of land.

The non-compensated singular firm factor is evident by the following facts:

- producing very few products or just one product, accompanied by
 - a monopoly situation (one firm!)
 - automated production and small administration
 - old, fully depreciated machines

1) Investigation without knowing firm names.

- following "strong" strategies by
 - a stable clientele
 - filling a niche in the market
 - capably exploiting special situations,
i.e. following a very flexible strategy
of pricing and product quality

Dropping firms characterized by such factors - which show possible advantages of small business - would result in a much weaker judgment of small business. The long-term aspects of owner-managed small and medium-sized firms can be demonstrated on the basis Tables 6, 7 and 8.

In Table 6 the personal expenses as a percentage of sales show the influence of salaries to the managing owners with respect to the wage structure. The growth in wages may reach the maximum load of a small firm quicker because of the inability to establish proper capital budgets. This argument is confirmed by the retardation of depreciation (see Table 7, especially row 3).

In addition we can state increasing debt ratios in firms - whatever the legal basis of the firm may be (see Table 8). Reasons for the differentiation of debt ratios have been presented in (11). In Table 8 the higher ratios of the single traders and partnerships are due to private property being the basis for liability to the creditors.

Table 6:

Mean Personal Expenses as a Percentage of Sales 1968 - 1977

All investigated firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
- Without Correction	30.6	30.0	29.5	31.0	30.8	32.2	32.5	32.1	32.9	32.9
- Correction I	31.9	31.2	30.5	32.1	31.9	33.4	33.8	33.3	34.1	34.3
- Correction II	32.7	31.8	31.1	32.6	32.5	34.0	34.4	33.9	34.7	35.0

Table 7:

Mean Depreciation-time of Fixed Assets (Years)

1968 - 1977

Row	Group of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	Limited companies (GmbH)	7.4	7.8	7.7	7.4	6.9	7.0	6.5	5.9	5.7	5.9
2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	5.2	4.6	4.7	7.3	6.9	8.7	7.4	7.3	7.1	7.5
3	Single traders and partnerships in trade (Einzelkaufmann, OHG, KG)	5.5	6.0	7.2	7.2	6.0	6.9	6.9	7.4	7.2	7.2
4	All investigated firms	6.0	6.3	7.1	7.3	6.4	7.1	6.8	7.0	6.8	6.9

Table 8:

Mean Percent Debt Ratios 1968 - 1977

Row	Group of firms	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	Limited companies (GmbH)	57.2	61.0	63.3	66.7	60.7	61.9	64.9	63.8	64.1	64.6
2	Partnerships in trade with a limited company as the partner with full liability (GmbH & Co. KG)	45.2	48.1	50.2	50.3	51.2	54.6	61.8	68.0	67.1	69.8
3	Single traders and partnerships in trade (Ein- zelkaufmann, OHG, KG)	62.3	66.5	65.1	67.8	65.3	68.1	70.1	72.8	72.1	70.9
4	All investigated firms	59.0	63.0	63.0	65.6	62.5	65.0	67.8	69.8	69.4	69.1

The material seems to allow some conclusions about the differences between small and medium-sized firms - though we do not apply multivariate statistical methods as in (11). In Table 9 selected ratios have been computed separating the firms in two groups according to the size measure "employee" (cf. Table 1):

- small firms, characterized by up to 99 employees in 1977
- medium-sized firms, characterized by 100 and more employees.

All figures in Table 9 are based upon the corrections discussed above. The management salaries and risk premiums have been computed on the basis of correction II.

The following tendencies can be derived from Table 9:

1. Small firms show a smaller rate of return on sales, but a larger rate of return on capital - due to a quicker turnover of capital and higher sales per employee (see rows 1 to 4 in Table 9). This is accompanied by an advantage with respect to personal expenses per employee (see row 5). It is an open question if these statements are generally true.
2. Small firms show a poor financial and asset structure (see rows 6 to 8). It cannot be answered definitively if these findings are caused by the inability to raise further capital or merely by the accounting behaviour factor.

Table 9:

Comparison of Small and Medium-Sized
Firms by Selected ratios

Row	Type of Ratio	Size	'68	'69	'70	'71	'72	'73	'74	'75	'76	'77
1	Rate of return on sales (before taxes)	small	3.1	3.6	5.0	3.5	3.8	1.9	2.3	2.2	1.4	3.1
		medium-sized	5.9	7.3	5.6	4.0	5.5	4.9	4.6	4.2	3.3	5.0
2	Rate of return on total capital (before taxes)	small	10.1	11.2	15.5	10.1	11.9	7.4	11.6	10.6	10.9	13.3
		medium-sized	13.6	16.1	13.7	9.9	12.2	12.7	12.2	11.2	9.6	11.8
3	Sales per employee (in 1000 DM)	small	51.4	52.8	65.4	69.0	77.0	83.4	91.4	90.9	103.4	113.0
		medium-sized	46.3	53.1	48.0	64.3	66.0	76.7	81.0	91.1	95.7	100.8
4	Turnover total capital with respect to sales	small	2.4	2.4	2.4	2.1	2.2	2.1	2.2	2.1	2.2	2.3
		medium-sized	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.1	2.2	2.2
5	Personal expenses per employee (in 1000 DM)	small	11.2	11.8	13.9	15.7	17.6	20.6	23.4	23.0	25.4	28.3
		medium-sized	12.6	14.2	15.6	18.2	18.8	21.7	23.9	26.1	28.7	30.8
6	Equity to fixed assets (%)	small	100.8	98.2	99.9	97.3	121.2	107.6	119.4	90.7	95.2	106.7
		medium-sized	129.2	126.4	125.0	106.6	116.7	124.7	125.3	131.5	140.6	150.0
7	Debt ratio (%)	small	63.0	67.2	66.0	68.5	64.4	69.1	69.8	73.7	73.2	71.9
		medium-sized	54.3	57.9	59.4	62.2	60.2	60.0	65.3	65.2	64.8	65.7
8	Depreciation-time of fixed assets	small	5.8	6.2	7.6	7.0	6.6	7.5	7.3	7.5	7.1	7.4
		medium-sized	6.2	6.5	6.5	7.6	6.1	6.6	6.2	6.3	6.4	6.3

5. Conclusion

On the basis of 55 small and medium-sized manufacturing firms we have shown that a responsible computation of rate of return figures requires corrections of the original balance sheet data and how these corrections effect nominal rates of return. The correction process is based upon a multitude of assumptions so that a clear statement of these assumptions must be given.

Though we did not draw a random sample and though the material was analysed by regarding only mean figures, some generalizations seem to be appropriate. Small and medium-sized firms show a weaker decline in profitability in comparison to large firms [see (11) for this case]. Size effects seem to exist also within the group of small and medium-sized firms. Thus the investigation of such firms should be continued and strengthened.

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