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DEFENSE INDUSTRY PROFIT REVIEW

LMI Task 69-1

March 1969

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4701 Sangamore Road
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FOREWORD

For the development and production of weapon systems and other military hardware, the United States Government looks primarily to privately owned, profit-oriented industry. The success of such an arrangement depends upon many things; for example, a high order of planning skill and managerial capability within both the Government and industry. One of the ingredients for success is fair industry profit, and it is upon that single ingredient which this study focuses.

The Department of Defense (DoD) must employ contracting policies and methods that create an environment in which profit opportunities are large enough to attract sufficient equity and borrowed capital for defense work. Otherwise the best industrial capabilities will be driven out of the defense market. The DoD also must be concerned, however, that defense business profits do not become excessive. Just where the profit range should fall is a matter of judgment and a point on which there probably will always be disagreement. This report makes no recommendation as to what the range or level of defense business profit should be. It is, however, intended to serve as a partial basis for DoD management's assessment of the adequacy of defense business profits, as part of their continuing evaluation of contracting policies and methods.

The adequacy of earned (as opposed to negotiated) profit on defense business cannot be assessed from DoD data or company published data, because the DoD data are incomplete and the company data do not isolate defense business. Nor can the adequacy of profit on defense business be established, in the short run, by observing the degree to which companies seek defense business. A company's decision to change its market generally is not implemented in a short time without severe financial consequences. By the time it is clear that such a change is occurring, its effects cannot be avoided and counteraction by the DoD may be a long term undertaking.

It is necessary, therefore, for DoD management to infer from analysis whether defense business profit opportunities are sufficient to attract the capital required to maintain a strong defense industrial base, yet are not excessive. The Logistics Management Institute (LMI) Defense Industry Profit Review was established to assist in that analysis by: (1) making available for the first time an array of data which segregates all defense business profit, sales, and capital from commercial and other government profit, sales, and capital; (2) highlighting, from those data, information likely to be of use in the DoD assessment of profit adequacy; and (3) investigating the effect of DoD contracting policies and methods on the relationships observed in the data.

The LMI Profit Review began in June 1966, when a task order was issued by the Assistant Secretary of Defense (Installations and Logistics). A report was issued in November 1967,[1] covering the nine-year period 1958 through 1966.

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[1] "Defense Industry Profit Review," LMI Task 66-25, November 1967. Obtainable in two volumes from the Department of Commerce Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia. Volume I is identified by Number AD 664700; Volume II is AD 664701.

Under a new task order from the same office, the Profit Review was continued. Data for 1967 were obtained and additional analysis performed. This report is the product of that effort.

This report is self-contained. Where 1958-1966 data or other information from the prior report are pertinent, they are repeated.[1] A large amount of material from the November 1967 report, however, is omitted in this volume. For example, there is no discussion of the capital market analysis and no summary of the discussions with defense industry management. The reader therefore is encouraged to obtain or retain the initial report along with this one.

This report incorporates some data and analyses which are the result of comments made by readers of the November 1967 report. Other suggestions were not incorporated primarily because of inability to obtain the necessary data. For example, it was contemplated that some of the data would be presented by product categories. This was not possible because many of the companies could not submit data in that form. Data on one product line were received for 1967, but they were not considered meaningful without comparative data for prior years.

This report may be divided into three categories:

An introductory section includes background material, definitions, and explanations of the financial ratios used. Sections II and III contain the LMI findings and conclusions and discussion of the research methodology and validation procedures.

Sections IV, V, and VI summarize the evidence which supports the findings and conclusions.

Sections VII, VIII, and IX contain supporting data.

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[1]Minor clerical errors in the 1958-1966 data have been corrected in the tables in this report. None of the errors was large enough to alter the conclusions.

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SECTION I

INTRODUCTION

A. BACKGROUND

Beginning in the early 1960's the Department of Defense made a number of changes in its procurement and contracting policies which directly or indirectly influenced the profitability of defense business. On balance, these changes significantly increased contractors' risks. Some of these changes were:

- Increase in price competitive procurement.
- Decrease in cost-reimbursable contracting, and increase in incentive and firm fixed-price contracting.
- Increase in working capital requirements of contractors primarily because progress payments by DoD on the higher proportion of fixed-price contracts were at a lower rate than reimbursements on the lower proportion of cost type contracts.
- Reduction in government-furnished facilities, requiring more contractor facilities with consequent increase in contractors' capital requirements.
- Increased emphasis on breakout (ASPR 1-326, October 1965), the effect of which was an increase in the proportion of government-furnished material and, therefore, a decrease in the prime contractors' ratio of sales to capital.

In the period from 1956 to 1962, the published annual reports of the Renegotiation Board indicated a steady decline in average defense industry pre-tax profit on sales from 6.5% to 3.1%. Hearings before the Senate Government Operations (McClellan) Committee underscored the fact that application of standard average percentages to total cost or sales dollars without consideration of individual performance is not a sound way to arrive at target profit. Studies by the DoD showed that negotiated profit percentages clustered within narrow ranges by contract type.

On 15 August 1963 the Department of Defense promulgated a new profit policy, known as the Weighted Guidelines, for application to contracts negotiated subsequent to 1 January 1964. That policy, which appears in Paragraph 3-808 of the Armed Services Procurement Regulation (ASPR) includes the following statement:

> ". . . Effective national defense in a free enterprise economy requires that the best industrial capabilities be attracted to defense contracts. These capabilities will be driven away from the defense market if defense contracts are characterized by low profit opportunities. Consequently, negotiations aimed merely at reducing prices by reducing profits, with no realization of the function of profit, cannot be condoned. . ."

In order to exercise surveillance over the weighted guidelines procedure, a data collection system was established by DoD early in 1964.[1] Data on profits on a selected group of contracts have

[1] The DoD data collection system is described in ASPR XXI.

been compiled for the fiscal years from 1959 through 1968. The data are of two types:

(1) Negotiated ("going-in") profits on contracts negotiated under the Weighted Guidelines as reported by the contracting officer at the time the contract price is agreed upon, prior to contract performance; and

(2) Final profit rates, which are obtained after the contracts are completed and earned profit data are available. The system receives data only on those types of contracts where the DoD has knowledge of earned profits. It does not include data on the final profits on firm fixed-price contracts.

The Weighted Guidelines procedure is applicable to profit <u>objectives</u> on negotiated contracts. Hence the results depicted by the DoD data collection system, in the case of "going-in" profits, are only an indication of the potential level of industry's profitability. The data on earned profits are slow[1] in entering the DoD data collection system and are incomplete in that they do not include FFP contract results. Also, neither the profit policy nor the DoD reporting system was applicable to price competitive contracts upon which an ever increasing share of the

[1]As noted above, profit is not reported until a contract is complete. The contract may cover several years, during which time profits are booked by the Contractor in each year as sales are recorded.

DoD procurement budget was being spent. To help shed light on both areas - i.e., realized profits in general and profit on price competitive contracts in particular - the Logistics Management Institute was asked to undertake a study effort in which realized defense industry profit would be obtained on a voluntary basis from a sampling of defense industry. That became the task upon which this report is based.

B. THE DEFENSE INDUSTRY SAMPLE[1]

The population to which the conclusions of this report apply is defined to be those companies which have:

(1) At least 10% of total company business in defense sales.

(2) At least $25 million annually in defense sales.

Data were obtained from 40 companies, stratified as follows:

Categories	Annual Defense Sales	No. of Companies
High Volume	$200M or more	23
Medium Volume	$25M to $200M	17

The study method was dependent upon the cooperation of individual companies in disclosing sales, capital, and earnings data. The data submitted are extremely sensitive and proprietary, hence in this report they are consolidated and presented in the form of averages with confidence intervals, and ranges, including deviations, and percentiles.

In addition to individual companies, other data sources consulted included the Department of Defense, the Department of Commerce, the Federal Trade Commission, the Securities & Exchange

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[1] See Section III for further discussions of the defense industry sample.

Commission, the Federal Reserve Board, the Renegotiation Board, defense industry associations, and the National Industrial Conference Board.

C. INDUSTRIAL COMPARISON GROUP (FTC-SEC)

Since it was considered desirable to compare profits of the defense sample with those of comparable industrial companies, a selection was made of durable goods industrial groupings from the FTC-SEC Reports on Manufacturing Corporations. The selection includes the following groupings:

Standard Enterprise Classification Codes	Industry
37	Transportation Equipment
36	Electrical Machinery, Equipment and Supplies
35	Other Machinery
34	Other Fabricated Metal Products
38	Instruments and Related Products
39	Miscellaneous Manufacturing and Ordnance

Those groupings constitute 3500 companies of the 175,000 filing quarterly financial reports with the Federal Trade Commission and Securities and Exchange Commission. (Virtually all of the companies included in the defense industry sample are also in the FTC-SEC group.)

The FTC-SEC ratios shown in the report are believed appropriate because the business of the companies comprising the selected FTC-SEC groups is comparable with that of the defense industry companies and the data are based on the same definitions of financial terms.

D. DEFINITIONS OF FINANCIAL TERMS

After considering several alternative methods of defining the financial terms used in this study, LMI adopted definitions which were considered to best meet the criteria of (1) availability of data, (2) compatibility with published data, and (3) acceptability by financial and management analysts.

In the definitions listed below, sales and profits are annual, using each company's fiscal year. Investment amounts are as of the end of each company's fiscal year.

(1) Total Sales - Net sales to all customers.

(2) Defense Sales - Net sales to DoD, both prime contract and subcontract.

(3) Other Government Sales - Net sales to all federal agencies other than DoD.

(4) Commercial Sales - Net sales of the defense industry companies to commercial customers, to state and local governments within the U.S., and to foreign governments.

(5) Equity Capital Investment (ECI) - The total dollars assigned to capital shares and surplus.

(6) Defense ECI, Other Government ECI, Commercial ECI - The share of ECI which is allocable to Defense, Other Government, and Commercial Business respectively.

(7) Total Capital Investment (TCI) - Equity Capital Investment plus Long-term Debt.

(8) Defense TCI, Other Government TCI and Commercial TCI - The share of TCI which is allocable to Defense, Other Government, and Commercial Business respectively.

(9) Total Profit - The net income or loss before provision

for federal income taxes and before reduction of profits as a result of renegotiation.

(10) Defense Profit - The net income or loss on prime contracts and subcontracts of the DoD, after deduction of all allocable costs whether or not disallowed or non-recoverable, but before provision for federal taxes on income and before any reduction of profits as a result of renegotiation.

(11) Other Government Profit - The net income or loss on Other Government Sales, computed on the same basis as Defense Profit (above).

(12) Commercial Profit - The net income or loss on Commercial Sales.

(13) Profit, After Tax - Profit, as defined in (9) through (12) above, but after deducting federal taxes on income.

E. USE OF RATIOS

Generally, the conclusions and supporting rationale in this report are expressed in terms of weighted average ratios.[1] The Profit/Sales ratio is an example. In averaging that ratio, the individual company ratios are weighted in direct proportion to each company's sales. Hence, a company with twice as much sales as another has twice as much impact on the profit to sales average. In calculating Sales/TCI or Profit/ECI weighted average ratios, the individual company ratios are weighted in a similar manner, but in direct proportion to each company's TCI or ECI.

Ratios are always expressed as percentages even where the

[1] See Sections VII & VIII for discussion of weightings.

description is shown as a fraction, e.g. Profit/TCI.

In addition to the weighted averages, this report also contains range information on capital turnover, profit on sales, and profit on capital. While averages are important, they frequently cause the reader to subconsciously view each piece of the sample making up the total as though all were equal to the average. Each company is different from the others. A division in a major conglomerate is different from other divisions in the same conglomerate. Consequently, interpretations based on averages alone can often be incomplete.

This is not to say that averages are not important. However, if the averages in this study reveal any problem which requires a revision of procedures or practices, the range data and distribution curves should provide the policy-makers with the best information on how and where their efforts should be directed.

A discussion of the principal ratios follows:

(1) <u>Profit/Capital Ratios</u>

LMI believes that the percentage of profit earned on total capital investment (Profit/TCI) is the most meaningful ratio for evaluation of DoD profit policies. This ratio presents profit from the "managerial approach" which is conceived by Dr. W. A. Paton as being "the net return resulting from all the activities of the business on the total economic capital employed, regardless of the sources of such capital or the beneficial interests therein."[1] The total capital concept is also emphasized in a popular system of financial charts published in booklet form

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[1]Paton, W. A. <u>Accountants' Handbook</u>, Third Edition. New York. The Ronald Press Company, 1945.

by E. I. DuPont de Nemours and Company,[1] where it is stated "the DuPont Company believes that operating management should be responsible for turning in a profit on capital assigned to that management, regardless of how the capital was raised."

Although the key ratio used by LMI for analysis purposes is profit on TCI, this report also includes ratios of profit on equity capital (Profit/ECI) for the information of those who may be interested in the analysis of income from the standpoint of the owners (stockholders) of companies.

Tests were made to determine whether different conclusions would have been reached by consideration of profit on ECI rather than profit on TCI.[2] It was concluded that the use of profit on ECI would not have resulted in any difference in comparative trends. However, the Long-term Debt/Equity ratio of the High and Medium companies is considerably higher than that of the FTC-SEC companies. By using profit on TCI, DoD can evaluate the effect on its profit policies on capital employed, without regard to the difference in management choices of financing methods, or in marketability of securities among the companies.

Several alternatives to the definitions of profit and TCI adopted for this study were tested.[3] Without regard to their merits in varying situations, LMI has determined that none of the alternate definitions of capital or profit, if adopted, would have altered the conclusions expressed in this report.

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[1] Executive Committee Control Charts, Treasurer's Department, E. I. DuPont de Nemours & Co., Wilmington, Del., 1959.

[2] See Section IV, p. 42.

[3] See discussion, p. 44.

(2) Supporting Ratios

The principal supporting ratios used in this report are total capital turnover (Sales/TCI) and profit on sales (Profit/Sales). The product of these two ratios is profit on investment:

$$\frac{\text{Sales}}{\text{TCI}} \times \frac{\text{Profit}}{\text{Sales}} = \frac{\text{Profit}}{\text{TCI}}$$

Hence, an understanding of the behavior of these two supporting ratios provides the basis for evaluation of the Profit/TCI ratio.

Capital turnover is the term used to describe the relationship of sales dollars to capital dollars. For example, assume annual sales of $300,000 and capital of $100,000. The turnover rate in such case is 3 to 1, i.e. sales ÷ capital = 3. Capital is always expressed as 1; hence this turnover rate would be stated in abbreviated fashion as "3.00".

The impact of capital turnover on the Profit/TCI ratio is illustrated below:

	Co. A	Co. B
Sales	$3,000	$3,000
TCI	$3,000	$1,000
Profit	$ 240	$ 240
TCI Turnover (Sales/TCI)	1.00	3.00
Profit/Sales	8.00% (.08)	8.00% (.08)
Profit/TCI	8.00%	24.00%

Or, using the formula:

Co. A 1.00 X .08 = .08 = 8.00%

Co. B 3.00 X .08 = .24 = 24.00%

Capital turnover is influenced by variations in sales volume and in capital investment, which change the percentage relationship between them. An increase in sales volume without a proportionate increase in capital raises the capital turnover ratio.

A percentage increase in capital beyond the percentage increase in sales would have the opposite effect.

Generally, the operating ratios throughout this report are percentages of sales, rather than percentages of costs. The sales basis was chosen as being the common method of reflecting percentages throughout industry and the financial market. If it is desired to compare profit on sales with DoD procurement statistics which reflect profit on costs, the Profit/Cost ratio may readily be derived from the Profit/Sales ratio by means of the following formula:

$$\frac{\text{Profit}}{\text{Cost}} = \frac{\text{Profit}}{\text{Sales}} \bigg/ \left(1 - \frac{\text{Profit}}{\text{Sales}}\right)$$

For example, if the profit on sales is 8%:

$$\frac{\text{Profit}}{\text{Cost}} = .08/(1 - .08) = .087 = 8.7\%$$

After considering the alternatives of stating profit before or after federal income taxes the decision was made to use before tax ratios for analysis purposes. This method was chosen to facilitate relating the ratios to price negotiation policy and to numerous DoD and industry statistics, and also to avoid distortions that would result from the rates of tax which vary among the companies and from year to year. However, since the after tax percentage is the valid measure of net business profitability, after tax Profit/TCI ratios are included in summary form in Section II. The reader should bear in mind that the before tax ratios used in all other portions of the report are subject to reductions (averaging in 1967 approximately 45%[1]), if the data are used to measure net business income.

[1] In the High and Medium volume companies, and also in the six durable goods industry groups as shown in the FTC-SEC Quarterly Financial Report of Manufacturing Companies for 1967, the average 1967 income tax as a percentage of pre-tax profits was approximately 45%.

SECTION II

FINDINGS AND CONCLUSIONS

A. GENERAL

This report contains comparisons between defense profit and commercial profit and between defense profit in certain situations and defense profit in other situations. It does not contain any conclusion on the adequacy of defense profit or profit opportunities. Such a conclusion would need to be based upon considerations broader than those covered in this study. Furthermore, it is not LMI's role to express judgment on what defense profit should be.

The purpose of this section is to provide DoD with conclusions on the impact of its contracting and profit policies during the period 1958 through 1967 on those companies whose annual defense sales are in excess of $25 million. The message is presented in three parts:

1. Findings, which comprise three generalizations which can be drawn from the data collected on High and Medium volume defense contractors;

2. Conclusions, which focus primarily on causes of the findings and are products of the analytic part of the study; and

3. The need for DoD action.

B. FINDINGS

1. Average defense business profit as a percent of total capital investment trended steadily downward during the first seven years of the study period and, after a slight improvement, remained at about the same level during the last three years. The averages of commercial business and FTC-SEC profits,[1] which had a substantial upward trend through the middle years of the study period, were lower than defense business profits in the first four years but higher in each of the last six years. The gap narrowed in 1967. (References: Chart II-1, and Table IV-1).

Average defense Profit/Total Capital Investment declined more than twenty-five percent over the ten-year period. It did so by a decline of more than thirty-five percent during the first seven years, and then a slight rise to a plateau for the rest of the period.

Average commercial Profit/Total Capital Investment fluctuated much more widely than did the defense profit rate. Commercial profit declined in the first three years, held steady for a year, rose sharply for three years, held steady again, and then dropped sharply in the last year. It was higher in each of the last six years, however, than in any of the preceding years; and the average for the last six years was more than fifty percent

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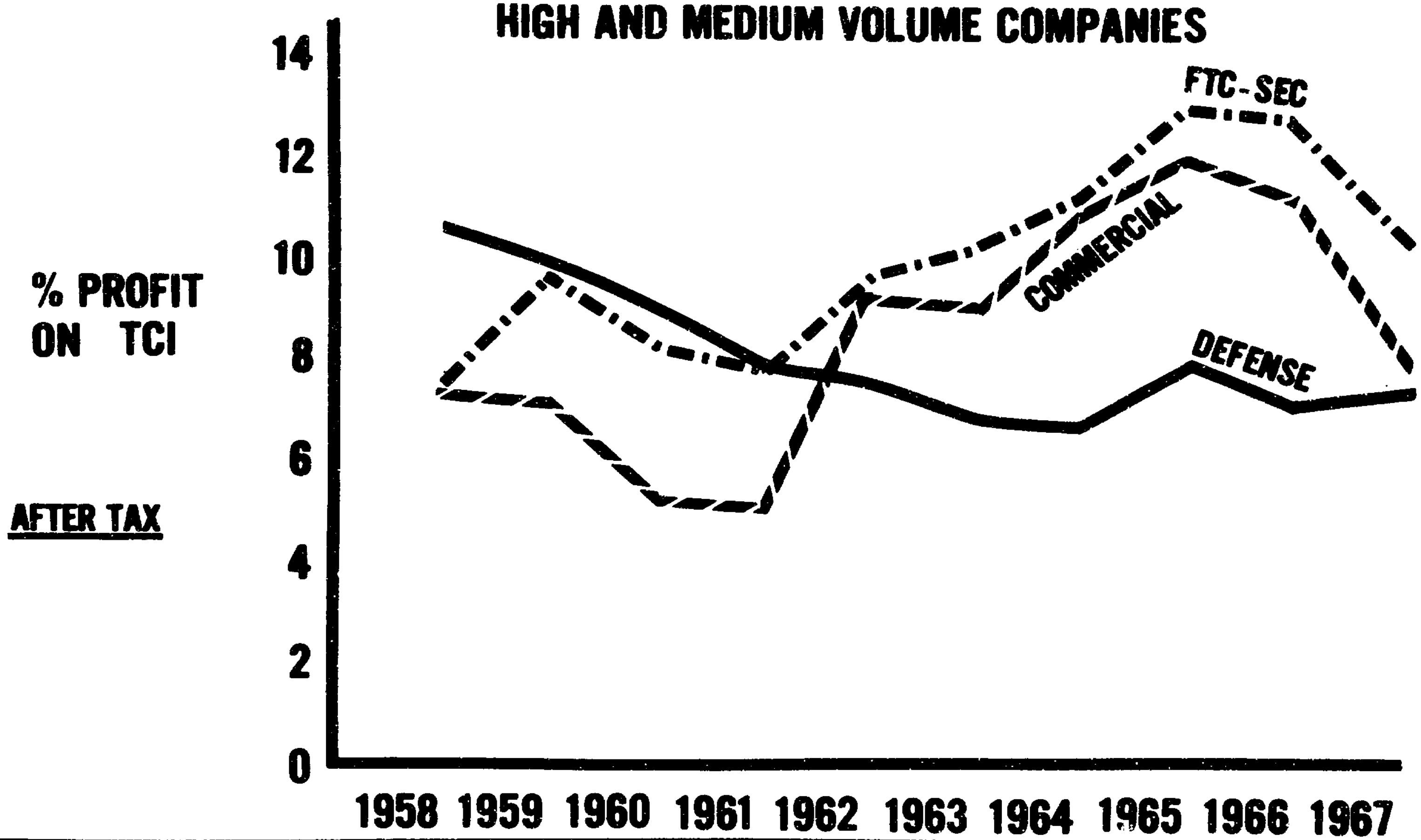
[1] As explained in Section I, "commercial business" is defined to be the business performed by defense industry companies for their non-Government customers. "FTC-SEC business" is that performed by 3500 durable goods manufacturers whose business is comparable with that of the defense industry companies.

PROFIT ON TOTAL CAPITAL INVESTMENT
HIGH AND MEDIUM VOLUME COMPANIES



	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
DEFENSE % PROFIT ON TCI	10.1	9.5	8.7	7.5	7.4	6.5	6.3	7.6	7.0	7.3
COMMERCIAL % PROFIT ON TCI	7.0	6.8	4.8	4.7	9.0	8.7	10.9	11.6	10.8	7.4
FTC-SEC % PROFIT ON TCI	7.1	9.3	7.8	7.4	9.3	9.8	10.8	12.6	12.4	10.1

Chart II-1

higher than that of the prior four.

Average FTC-SEC profit as a percent of total capital investment followed the general pattern of commercial business profit, but with less wide fluctuation over the years. FTC-SEC profit was higher than commercial business profit in all years.

Both commercial and FTC-SEC profit on total capital were below the defense figure at the beginning of the study period. They rose above that figure after four years and stayed above it thereafter.

2. <u>High profit defense business has been less profitable than high profit commercial business during the study period; low profit defense and commercial business have been about the same in profitability since 1962</u>. (References: Tables II-2, and VII-38.)

Averages tell only part of the story on defense business profitability. It is important also to look at the extent to which individual company experience differs from average experience.

The range data on defense business profit on total capital investment depicted on Tables II-2 and VII-38 show that individual company experience varies widely. The range of profit on total capital investment for defense business, however, is much narrower than that of the same ratio for commercial business. The defense range falls in the lower part of the commercial range. High profit defense business, in other words, is not as profitable as is high profit commercial business. Low profit defense business in the past six years is at about ,ame level of profitability as is low profit commercial business. The highest portion of the defense business profit range is twenty-five to sixty percent lower than the highest portion of the commercial business profit range over the ten-year study period.

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

After Tax

High and Medium Volume Companies

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	10.14	5.07 - 16.72	0.85 - 20.25	6.95	(17.97) - 34.07	(39.53) - 54.28
1959	9.49	4.13 - 15.34	0.50 - 19.07	6.81	(5.61) - 23.57	(21.84) - 33.36
1960	8.66	2.96 - 13.66	0.20 - 18.04	4.75	(14.57) - 30.34	(36.07) - 43.57
1961	7.54	3.04 - 12.73	(0.15) - 15.92	4.69	(9.83) - 22.40	(27.06) - 34.15
1962	7.39	2.73 - 12.68	(0.41) - 15.97	9.02	0.55 - 17.62	(5.89) - 24.36
1963	6.50	1.87 - 10.99	(0.57) - 14.25	8.67	0.71 - 17.39	(4.80) - 22.90
1964	6.34	0.68 - 11.61	(2.24) - 15.56	10.88	3.23 - 19.79	(2.91) - 25.29
1965	7.60	1.22 - 13.44	(1.97) - 18.28	11.56	4.32 - 19.52	(0.65) - 24.65
1966	6.98	1.13 - 13.67	(3.07) - 17.70	10.77	0.44 - 22.73	(7.21) - 29.89
1967	7.28	2.50 - 13.20	(1.10) - 16.70	7.37	(2.03) - 17.56	(8.89) - 24.69

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

[3] For any fixed amount of TCI (defense or commercial, as appropriate) selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated ranges.

Table II-2

3. The commercial market of defense industry companies, as well as that of the durable goods industry in general, has expanded much more rapidly than has the defense market in the ten-year period studied. (Reference: Chart VI-1.)

Between 1958 and 1967, defense sales of the population studied increased about fifty percent. Commercial sales of the same population rose almost two hundred percent. FTC-SEC sales increased more than one hundred ten percent.

In 1958, twenty of the forty High and Medium volume companies in the LMI sample did more than seventy percent of their business with the DoD; in thirteen of those twenty, defense sales were more than ninety percent of total company sales. In 1967 only eight High and Medium volume companies had seventy percent of their sales in defense work; none had as much as ninety percent.

The defense sales of the High and Medium company sample averaged sixty percent of total sales in 1958. In 1967, defense sales were forty-six percent of the total, despite a sharp increase in defense volume in that year.

C. CONCLUSIONS

1. Increased use of competition in DoD procurement has been largely responsible for reduced Profit/Sales ratios on defense business.

Since Profit/Sales times total capital turnover (i.e., Sales/Total Capital Investment) equals Profit/Total Capital Investment, and since the factors influencing Profit/Sales differ from those affecting total capital turnover, examination of the profit to sales ratio is a way of gaining insight into the causes of changes in the ratio of profit to total capital investment.

Defense business Profit/Sales declined more than twenty percent over the ten-year study period.[1] It dropped steadily from 1958 to 1963, rose from 1963 to 1965, and then declined in 1966 and 1967. The overall decline is significant not only because of its magnitude, but also because defense sales included a much larger proportion of higher risk fixed-price business in the latter years. The shift in contract risk might have been expected to result in a higher profit to sales ratio. Three different breakdowns of the defense profit to sales ratio lead to the conclusion that the increased use of competition in defense procurement is the major cause of the decline.

- Profit/Sales ratios were calculated for each of the major DoD contract types.[2] Profit on sales increased over the ten-year study period for both cost-plus-fixed-fee and cost-plus-incentive-fee contracts. Profit on sales on fixed-price incentive contracts remained stable during the first nine years and declined sharply in 1967. Firm fixed-price contract profit on sales, however, declined substantially during the study period. The average of that ratio for the last five years is less than half that of the first five years. Since price competitive business is fixed-price, competition and fixed-price contracting, both of which have increased dramatically during the study period, appear as likely causes of the defense business profit decline.

- Another breakdown of Profit/Sales data is the separation of price competitive and noncompetitive business. Price competitive defense business shows a sharp decline in Profit/Sales in the first five years and yields a result in the neighborhood of zero on that ratio from 1963 through 1967.[2]

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[1] Chart VI-1, p. 76.

[2] Table VI-6, p. 81.

- A third way of gaining insight into the drop in the defense business profit to sales ratio is to separate price competitive and noncompetitive business within the area of firm fixed-price contracting. The noncompetitive firm fixed-price profit to sales ratio on contracts negotiated under the Weighted Guidelines during the past several years has been in the neighborhood of ten percent.[1] For the overall firm fixed-price profit to sales ratio to be as low as it is, therefore, Profit/Sales on price competitive firm fixed-price business must be approximately zero.

Hence the increased use of competitive procurement is concluded to be the major cause of the decline in Profit/Sales on defense business of the High and Medium companies.

Another significant cause of the decline in the defense Profit/Sales ratio is the low profits (or losses) on other fixed-price (FFP and FPI) prime and subcontracts, which were not identified by DoD as "price competitive".[2]

It has been asserted that the employment of competition in new areas of work and the increased size and scope of contracts on major programs have created an environment where survival rather than profit is the goal and where "buying in" is common. Response to those assertions would require a penetrating study of the changing environment in defense contracting.

Another cause of declining Profit/Sales which should be acknowledged is the accelerated rate of inflation which has occurred in the last few years. Contractors undoubtedly underestimated cost increases which were to occur during contract performance. Such underestimating probably helped to depress

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[1] Table VI-8, p. 83.

[2] See p. 73 for a discussion of the DoD identification of price competitive contracts.

Profit/Sales on firm fixed-price contracts and could have been a major reason for the fixed-price incentive contract decline in Profit/Sales in 1967.

2. Increased company investment in facilities has been primarily responsible for reduced total capital turnover on defense business.

Total capital turnover is the factor which, together with Profit/Sales, yields Profit/Total Capital Investment as a product. Changes in total capital turnover, therefore, and the causes of those changes, help explain changes in the ratio of profit to total capital investment.

Total capital turnover on defense business declined from 3.8 to 3.1, more than eighteen percent, during the study period. All of that decline occurred after 1960. In the same span of time commercial business and FTC-SEC total capital turnover remained fairly stable between 2.0 and 2.2.[1]

The study data show that the primary reason for the drop in defense total capital turnover is increased company investment in facilities.[2] The ratio of facilities (at net book value) to sales for those members of the defense industry population who were examined rose forty-five percent from 1958 through 1967. During those ten years the same ratio increased less than four percent for the FTC-SEC companies. It seems significant that the strengthening of DoD resistance to providing facilities started in 1961.

3. Increased use of fixed-price contracts has been partially responsible for reduced total capital turnover on defense business.

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[1] Table V-1, p. 64.

[2] See discussion and table, p. 56.

Decreased DoD use of cost reimbursable contracts in the 1960's has meant that companies must provide more of the working capital required for defense business. Companies now have cost reimbursement on a smaller percentage of their business. On fixed-price work they receive progress payments instead, provided they qualify by having at least six months of cost incurrence prior to first item delivery. In general, progress payments now are eighty percent payments against incurred costs. Throughout the study period, however, they were at the seventy percent level.

For those defense industry companies examined, the ratio of net working capital to sales rose about one percent over the study period. The same ratio declined more than twelve percent for the FTC-SEC companies.[1]

Hence it is concluded that increased working capital requirements caused by greater use of fixed-price contracts has helped to bring about the decline in total capital turnover on defense business. Its influence has been less, however, than that of increased investment in facilities.

4. <u>Profit inequities exist because differences in capital requirements are not reflected in defense profit rates</u>.

In order to earn the same profit on total capital investment, a company with low total capital turnover must earn higher profit on sales than must a company with higher total capital turnover. Since companies vary widely in Sales/Total Capital Investment on defense business, their Profit/Sales on defense business might be expected to vary accordingly.

Defense business Profit/Sales, however, has been found not to be related to total capital turnover. The two ratios are statistically independent.

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[1] See p. 56.

If the companies are divided into two groups based on their defense business Sales/Total Capital Investment ratios -- an "upper" group consisting of those above the average ratio and a "lower" group consisting of those below it -- the average defense business Profit/Sales ratios of the two groups are almost the same.[1] The defense business Profit/Total Capital Investment of the upper group is more than twice that of the lower group, almost totally as a result of the difference in total capital turnover on defense business. If profit rates fail to reflect differences in company capital requirements, companies may be induced in some of their decisions to opt for subcontracting or purchasing rather than manufacturing, leasing rather than owning, and holding on to old facilities rather than modernizing their plant, even when such choices are not to the advantage of the Government.

On the average, Government facilities, progress payments, and cost reimbursement reduce the differences in total capital turnover among companies.[2] The average effect, however, fails to represent the effect in a large number of individual cases. Many companies with relatively low capital requirements receive substantial Government capital, while others with high capital requirements receive relatively little. Government capital as a percent of the total capital requirement for a company's defense business ranges from less than ten to more than eighty. Government property is not intended to be an instrument for achieving fair profit rates. It is provided when necessary to obtain contract performance and when it results in lower cost of the product. The authorization of progress payments and cost reimbursement is not related to differences in capital requirements, except insofar as progress payments are denied in cases of short production lead time.

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[1] See discussion and table, p. 60.

[2] See discussion and table, p. 61.

The providing of Government capital actually creates some unintended profit inequities. An example is seen in the comparison of High and Medium volume company profits in 1967.[1] Both sets of companies have about the same total capital requirement in relation to defense sales. Yet the total capital turnover of the High companies is more than thirty-five percent higher than that of the Medium companies -- Government capital being responsible for the entire difference.

5. <u>The change in the mix of commercial and defense business has resulted in more competition for resources and for new capital within the defense industry</u>.

Companies which have substantial amounts of both commercial and defense business have options in resource application which are not available to companies performing almost exclusively for the DoD. In the early years of the study period half of the High and Medium volume companies were dependent for their prosperity almost entirely on defense business. Now an overwhelming majority are heavily engaged in the commercial market. Commercial product lines have been developed; commercial firms have been acquired or merged with; and abilities to operate in the commercial market have been cultivated.

One result of the defense industry change in its commercial/defense business mix is more competition for use of existing resources -- primarily people, facilities, and money. Commercial business is competing with defense for both quantity and quality of those resources in companies where commercial business was a relatively unimportant sideline a few years ago.

There are still companies, however, which have divisions that are almost totally devoted to defense work. Resources

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[1]See table, p. 60.

within such divisions are not likely to be removed from the defense effort. Nevertheless, it should be recognized that those divisions increasingly are in competition with commercial divisions for new capital.

D. NEED FOR DOD ACTION

The low average profit on defense business as compared with profit on commercial and FTC-SEC business; the existence of profit inequities; and the increased capabilities of defense industry companies to participate in the commercial market, underscore the importance of the current DoD re-assessment of its profit policies. The question arises whether outstanding contractors are likely to be drawn away from the defense market by more attractive commercial profit opportunities or whether the special advantages of defense business adequately compensate companies for the lower profit (e.g., through Government-financed research and development work which benefits commercial product lines, or through sharing in the allocation of fixed overhead expenses to reduce commercial costs). It also must be asked whether contractors are motivated to make subcontracting, leasing, and modernization decisions that are in the best interest of the Government.

Increased use of competitive procurement is one of the key reasons for decreased Profit/Total Capital Investment on defense business. In such procurement, prices (and therefore profit) are set by market forces, not by guidelines, rules, or policy of the DoD. Even DoD policy changes in such areas as Government facilities and progress payments are negated in competition because the market normally will adjust in response to them. Except possibly for more use of wage and material escalation provisions, there seems to be little that the DoD can or should do to affect profit on competitive contracts.

Another of the key reasons for the defense business profit rate decline is the increase in fixed-price contracting. To the extent that competition and fixed-price contracting are overlapping areas, action to change much of the effect of increased use of fixed-price contracts is ruled out. However, there has been some concern that fixed-price type contracts may have been used injudiciously in some cases. DoD currently is studying the use of firm fixed-price contracts in the acquisition of development work, to determine whether any policy changes are required as the result of use of that contract type in inappropriate situations.

The general level of profit on noncompetitive defense business does not bear the same low relationship to commercial business profit as does profit in the competitive area. Nevertheless, there is a need for reviewing DoD policy in the noncompetitive area. As noted above, the use of fixed-price contracts is already being examined. However, the most serious problem which exists in the noncompetitive area appears to be caused by the failure of negotiated profit rates to reflect differences in capital requirements.

For example, Chart V-3 (p. 66) shows that total capital turnover on defense business varies widely among companies. A company may have a defense TCI turnover of 1.0 and a negotiated Profit/Sales rate of eight percent. The result in such an instance is a before tax Profit/TCI <u>opportunity</u> of eight percent -- approximately the current prime interest rate. In the case of another company whose defense TCI turnover is 6.0, the same negotiated Profit/Sales rate of eight percent would generate a Profit/TCI <u>opportunity</u> of forty-eight percent before tax.

It is possible, theoretically at least, to deal with the problem of profit inequities through provision of Government facilities or a new policy on cost reimbursement and progress payments. Those alternatives, however, do not appear to be wise courses of action.

Provision of Government facilities to correct profit inequities would amount essentially to using Government facilities to equalize total capital turnover among companies. Such a policy not only would destroy some of the motivational advantages of our capitalistic system of risks and rewards; it also would yield high administrative costs, complication of negotiation and contracting, and lower overall utilization of facilities. Furthermore, huge percentage changes in the amounts of government facilities would be required, because government facilities now are a very small proportion of the total capital required for defense business (less than six percent in 1967).

Progress payments and cost reimbursement policies could be adjusted to reflect differences in contractor capital requirements. The timing and the percentage level of progress payments would have to become variable, as would the timing of cost reimbursements. A large impact on total capital turnover could be produced because government-provided working capital is a large proportion of the total capital required for defense business (more than forty-five percent in 1967).

It would be administratively easier and just as effective, however, to address the problem of profit inequities through changes in negotiated profit as a percent of target cost. Profit negotiation would remain oriented around a single rate, but could encompass the necessary elements.

DoD presently has under consideration the question of whether its profit policy should be modified to give greater weight to company capital investment. LMI has made recommendations on this subject (Task 66-12) and has participated in discussions and tests of proposed methods. The findings and conclusions in this report confirm the need for continuance of the DoD effort. The Weighted Guidelines Method (ASPR 3-808) should be revised to give much greater emphasis to contractor capital required -- both fixed assets and working capital.

Return on investment is the most logically sound and widely accepted indicator of overall company performance. Since company capital requirements differ substantially for reasons largely beyond the control of management, return on investment cannot be equitable and motivate decisions in the interest of the customer unless companies with the largest capital requirements can earn much higher profit on sales than those with the lightest capital requirements.

SECTION III

SAMPLING AND DATA COLLECTION

A. GENERAL

The purpose of this section is to report the method used for selection of the sample companies, and to describe the data collected. The validity of the data and of the sample also are examined.

It was necessary to obtain the data for this study from the companies themselves because there is no other source for the data required to perform a comparative analysis of profit on defense and commercial business. Defense Department data are in the form of contract award amounts; the DoD has no data on defense subcontracts. Hence DoD profit data are incomplete and not consistent on a time basis with company annual records. Renegotiation Board data do not segregate defense business from other Government business subject to renegotiation. FTC-SEC data are in the form of composites of company sales and profits. No other significant data sources are known to exist.

This study never contemplated that the companies who participated in the study would be requested to subject their data to a detailed audit. Such an undertaking would have been far beyond the capability of LMI, and possibly beyond that of DoD. Aside from the unusual nature of an audit requirement in connection with a survey of this type, such an audit would have been very costly. Moreover, it was not necessary to conduct a special audit because other satisfactory and less costly methods of verification were available. Those methods generally involved reconciliation with published financial statements which had been audited by independent accountants, and other tests described in this section.

LMI's overall objective was to assure that the data, as a whole, were acceptable for drawing conclusions on defense industry profits. To meet this objective LMI verified:

(1) that the company data were acceptable, and

(2) that the sample was of adequate size and was representative.

LMI concluded that the data of the High and Medium volume sample companies could be used to represent the entire population of such companies.

B. SELECTION OF THE COMPANIES IN THE SAMPLE

As was mentioned in Section I-B, the population to which the conclusions of this report apply is defined to be those companies which have:

(1) at least 10% of total company business in defense sales;

(2) at least $25 million annually in defense sales.

That population is referred to in this report as High and Medium volume defense industry. The High volume companies are those with annual defense sales in excess of $200 million.

The sampling and data collection effort, however, covered a larger population: High, Medium, and Low volume defense industry. The Low volume population was defined to be those companies having:

(1) at least 10% of total company business in defense sales;

(2) between $1 million and $25 million annually in defense sales.

The initial screenings were based upon the following lists of companies:

(1) The DoD list of 100 largest defense contractors in fiscal year 1965.

(2) The Directory of Companies Filing Annual Reports with the Securities and Exchange Commission for 1964.[1]

(3) Standard and Poor's Security Reports.[2]

All of the High and Medium volume companies were identified. In the Low volume category, 116 companies were identified.

Because the High volume companies constitute a substantial percentage of defense business, all of them were asked to submit sales and profit data. Half of the Medium volume companies, randomly selected, were requested to provide data; and slightly less than half of the Low volume companies, also selected at random were solicited.

Of the companies solicited, 86% of the High volume companies, 61% of the Medium volume companies, and 49% of the Low volume companies responded with useful data. Very few companies refused to respond. Most of those companies which did not comply with the data requests were unable to supply the data in the form required or within the time allowed.[3] Responses revealed that two of the companies did not satisfy the population criteria. They therefore were eliminated from the sample. In another case a participating company merged with another in the list in 1965, leaving a total useful data sample of 65 companies prior to 1965 and 64 companies in 1965 and 1966. Additional mergers and acquisitions of Low volume companies left 59 companies in 1967.

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[1] Covers companies required to file annual reports under the Securities Exchange Act of 1934.

[2] Standard Listed Stock Report of the Standard & Poor's Corporation.

[3] That some companies had difficulty with the LMI request should not be surprising when it is recognized that they were asked to reconstruct in considerable detail events reaching 9 years into the past.

In summary:

Category	Annual Defense Sales	Original Number[1]	Number Solicited	Number Submitting Data	Useful Number
High	$200M or more	29	29	25	23
Medium	$25M to $200M	55	28	17	17
Low	$1M to $25M	116	53	26	25
		200	110	68	65

The defense business of the sample companies consisted primarily of durable goods development and manufacturing. Hence the companies were requested to screen their commercial data to eliminate dissimilar kinds of business, such as finance and insurance. To meet LMI's requirements, a few of the companies submitted the commercial data of their Government divisions or subsidiaries only. LMI tested those submissions against the same companies' published financial statements and determined that the profit ratios on their reported commercial business were comparable with those on their total commercial business; hence the division or subsidiary submissions were accepted.

C. DATA OBTAINED

After approval was obtained from the Bureau of the Budget for collection of data, standard formats[2] were forwarded to

[1]The total number of companies is now believed to be 27 High volume and 55 Medium volume. No data are available from the DoD to estimate the total number of companies having from $1M to $25M of annual defense sales, but it is considered large enough to permit the assumption of an infinite population of Low volume companies.

[2]The format is reproduced as Appendix A in the November 1967 report.

each company in the sample. The definitions of the individual data items corresponded with those given in Regulation SX of the Securities and Exchange Commission. The companies were advised to use the same annual period that they use in their reports to stockholders.

The companies were requested to segregate their sales and profit data among defense, other Government, and commercial business, and between prime and subcontract business. They also were requested to submit prime contract competitive business separately, using a list of contracts identified by DoD as price competitive.

Data on unallowable/nonrecoverable costs were requested for all years. For the period 1965-1967, the companies also were requested to provide data on the major categories of those costs.

For the 1967 submissions, the companies were requested to provide more detailed data. Those data covered amounts of debt, interest, facilities (company and Government), profits on FFP contracts negotiated under the Weighted Guidelines, receivables and related items, and defense sales backlog.

D. VALIDITY OF DATA RECEIVED

All of the companies in the sample submitted company data on sales, capital and profit. The data were separated into Defense, Other Government, and Commercial business. The initial analysis performed by LMI consisted of comparison of the company totals with published financial statements and other public information, and verification of clerical accuracy, consistency of approach, and uniformity in applying financial definitions. Those steps were followed by additional review of the defense and commercial segments of the data as discussed in the paragraphs below. Where validity could not be confirmed from the available information, LMI obtained additional clarification, either through supplemental data or through discussions with comp y officials.

To promote uniformity among companies, LMI provided definitions of the key financial terms. The companies already were knowledgeable in the determination of defense costs (hence defense profits) for the following reasons.

1. All of the companies in the sample continually have held contracts which required DoD audit surveillance. Such surveillance insures the acceptability of cost allocations to the auditable contracts, which include all cost-plus-fixed-fee (CPFF), cost-plus-incentive-fee (CPIF), and fixed-price incentive (FPI). Those contract types accounted for 65% of the sales of the companies in this study in 1967. Also, the approved accounting system for allocation of costs to auditable contracts provides equally acceptable allocations to all other contracts.

2. All of the contractors in the sample are subject to statutory renegotiation.[1] Hence they are required to segregate renegotiable sales and profits, which include defense and other Government business, from their commercial business. The extent of the other Government business was relatively insignificant in most companies and the cost allocations were readily obtainable because of the preponderance of CPFF and CPIF contracts. Virtually all of the companies in the LMI sample prepared their submissions for this study along with preparation of their renegotiation data.

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[1] U. S. Code - Title 50.

LMI requested the sample companies to present their defense profit and sales data by type of contract. The resulting profit to sales ratios were compared with earned profits reported by DoD contracting officers under the DoD Profit Review System.[1] The DoD system reflects earned profits on CPFF, CPIF, and FPI contracts, but not on FFP. The CPFF, CPIF, and FPI contract ratios developed in this study are comparable with those in the DoD system.

In the case of FFP contracts, while the DoD system does not contain data on earned profit, it does contain "going-in" profit on negotiated non-competitive contracts. LMI obtained data in 1967 on a $1.9 billion sample of those contracts which were awarded in 1964, 1965, and 1966. The companies reported earned profits before tax averaging 9.7% of sales, which appeared valid when compared with the negotiated (going-in) average of 10.4% in the DoD system.[2]

Contrary to the case of the companies' defense costs, their capital generally has not been subjected to DoD review. Hence, LMI placed major emphasis on assuring that the companies' determinations of defense capital were reasonable when compared with their other capital, and after considering the impact of capital furnished by the Government in the form of facilities and progress payments.

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[1] See Introduction, Section I-A for a discussion of the DoD Profit Review System.

[2] See Table VI-8.

Capital requirements vary by industry and among companies within an industry, even though the products made are similar. A company's capital requirement depends on the amount of Government capital used, the extent of subcontracting, the type of contractual coverage, and other influences. LMI found that a determination of the reasonableness of a single company's capital often requires familiarity with the company's total environment. In some cases, analysis required construction of a Capital/Sales ratio which included all of the capital used, both contractor-owned and Government-furnished.

Twenty of the High and Medium volume companies had more than 70% of their sales in defense business in 1958; 13 of the 20 had more than 90%. In such companies, a small misallocation of capital dollars would cause a substantial error in the commercial business Sales/Capital and Profit/Capital ratios. Absence of any indication of gross discrepancies in the commercial ratios justifies acceptance of those companies' defense business data and use of their defense business ratios for validation of the data of the other companies.

The capital data of each individual company were subjected to detailed analysis. In addition, two tests were applied to the average ratios computed from the total data of the High and Medium volume companies.

One test consisted of a comparison of the ratio of defense sales to total sales with the ratio of defense capital to total capital. Those ratios are shown in Chart III-1. If TCI had been allocated on the percentage of sales basis, the two lines would coincide. It can be observed that TCI was not allocated on that basis. The difference between the lines shows the extent to which use of Government capital, among other factors, produced a lower requirement for company capital on defense business than on commercial business.

The trend of the Defense TCI/Total TCI line reflects the effect of relatively recent DoD restrictions on providing facilities; it also reflects the additional contractor capital required by the shift to fixed-price contracts from 1961 through 1967.[1]

The other test involved verification that the companies assigned a fair share of capital to their commercial business. It was accomplished by comparison of the average commercial Sales/Capital ratios of the LMI study sample with those of the FTC-SEC durable goods companies. In view of the similarity of the business engaged in by both groups, the ratios would be expected to be comparable. Chart III-2 depicts the two ratios. The averages are almost identical throughout the entire 10-year period. Subtraction of the commercial data from the total company capital data, which are verifiable by published financial statements, supports the validity of the defense ratios.

The average defense business capital turnover ratios, also shown on Chart III-2, are above the commercial and FTC-SEC averages, again reflecting the impact of Government-furnished capital. The slope of the defense Sales/TCI line is traceable to the additional contractor investment in facilities and working capital for defense business, as noted above.

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[1] The ratio of the reporting companies' fixed-price contract sales to total defense sales was 44% in the period 1958-60, and rose to 74% in the period 1965-67. See Table VI-6.

E. ADEQUACY OF THE SAMPLE

The adequacy of a random sample to provide an average which represents the average of all companies in the population can be expressed in terms of confidence intervals. Confidence intervals for the average answer the question, "If we were to obtain data for all companies, by how much might the average of all companies differ from the average of the sample?" If a 90% confidence interval extends from x to y, we can say, "There is a 90% chance that the actual average of the population category is between x and y." Hence, a confidence interval tells us to what degree we can believe the sample average to be a measure of the true average.

Since a few companies declined to participate in the study and a number were unable to provide useful data, the sample was analyzed to determine whether a bias existed.

As noted in the November 1967 report, LMI obtained review of Renegotiation Board reports of some non-responding companies. This review indicated no profit bias in the sample. Hence, LMI concluded that defense profitability of the High and Medium companies in the sample was representative of profitability of all High and Medium companies in the population. Insufficient data were available to make that determination for the Low volume companies.

The Low volume sample may not be random. First, because the total population could not be identified, it was impossible to select a sample known to be random. Second, only companies listed with the SEC were solicited, and many Low volume companies are not so listed. However, even if the sample were assumed to be random, the confidence intervals for the Low volume averages are too wide to permit reliance on those averages as a basis for conclusions. Therefore, conclusions were drawn only from the High and Medium company data. Nevertheless, the Low volume company data are included in Section VII.

The High and Medium company sample included more than 85% of all High volume companies, accounting for 92% of High volume defense sales. It included more than 30% of all Medium volume companies, accounting for 49% of Medium volume defense sales. The question may be asked, "Was this sample adequate for meaningful statistical conclusions?"

Chart III-3 shows the 90% confidence intervals on the after tax defense Profit/Sales ratios of the High and Medium volume companies[1] over the 10-year period 1958-1967. In 1967, for example, the weighted average profit on sales of the sample was 2.33%, the center line. The outside lines show that the 90% confidence interval for the average is 2.03% to 2.63%. In other words, if the total population were surveyed, the 1967 average would almost certainly fall within plus or minus 0.3% of the average of the sample. The narrow limits justify the use of the High and Medium volume sample to draw conclusions about the total population of High and Medium volume companies.

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[1] See Section VII for confidence intervals on all of the financial ratios (before federal income tax) by population category.

COMPARISON OF DEFENSE SALES/TOTAL SALES
WITH DEFENSE TCI/TOTAL TCI

HIGH AND MEDIUM VOLUME COMPANIES

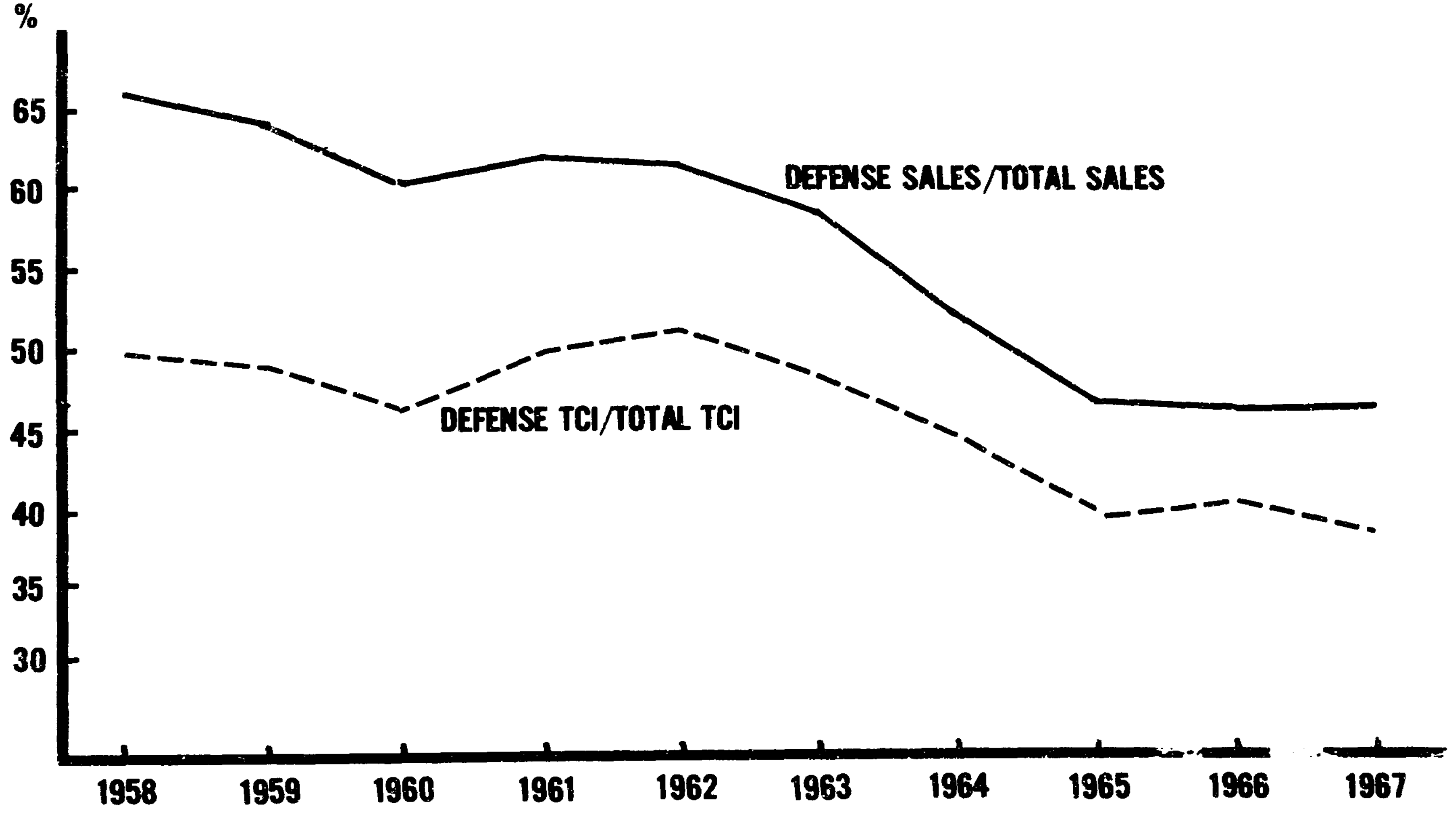


Chart III -1

RATIOS OF SALES TO TOTAL CAPITAL INVESTMENT

(TCI TURNOVER)

HIGH & MEDIUM VOLUME COMPANIES

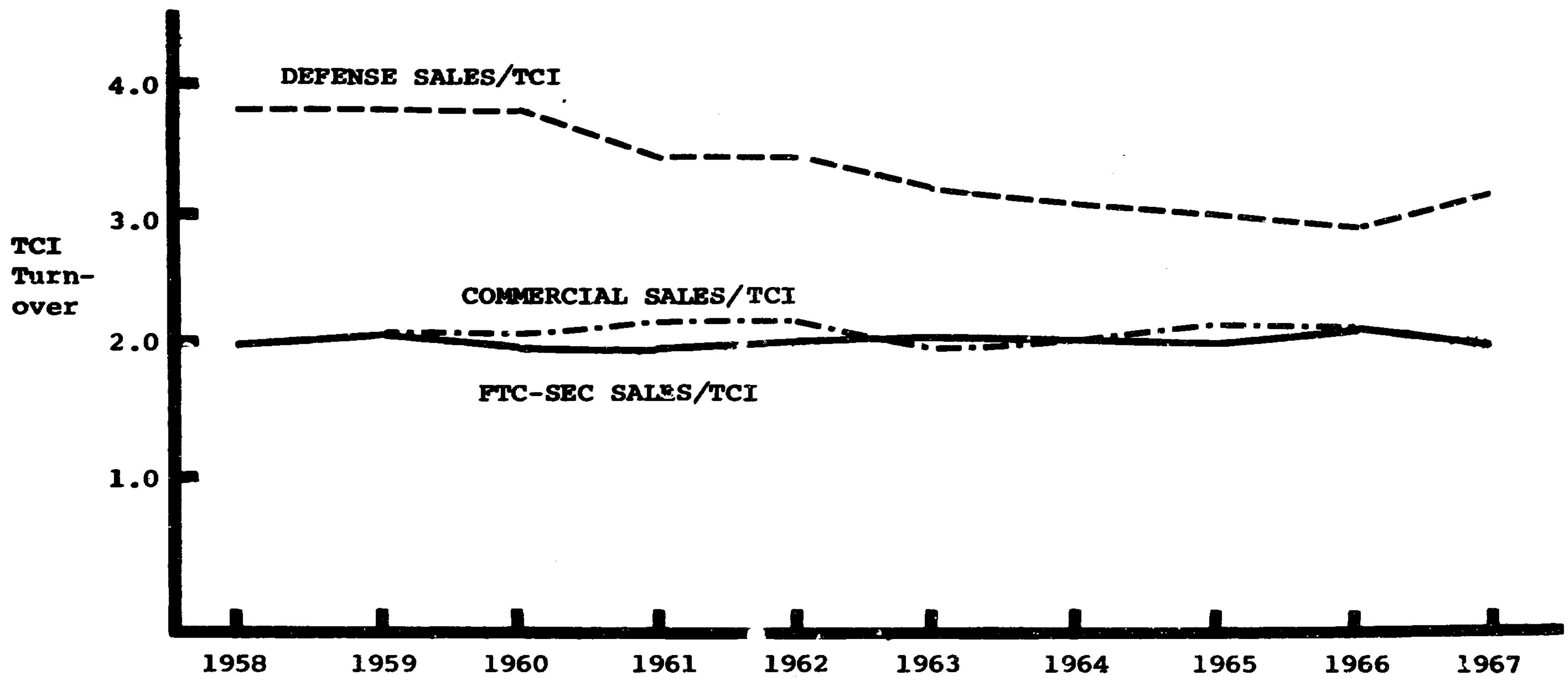


CHART III-2

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
DEFENSE PROFIT/SALES
HIGH AND MEDIUM VOLUME COMPANIES
AFTER TAX

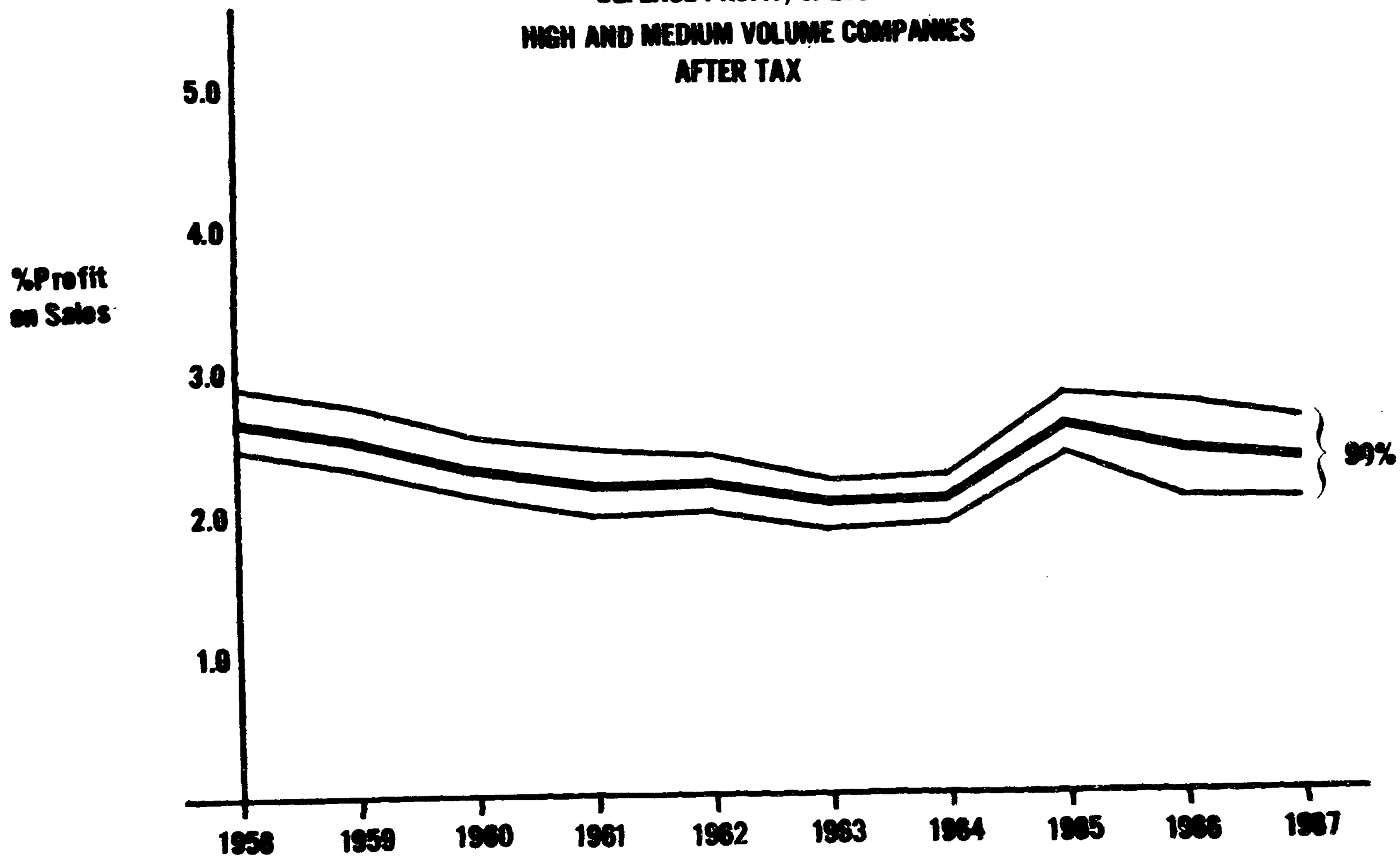


Chart III-3

SECTION IV

PROFIT ON CAPITAL INVESTMENT

A. PROFIT ON TOTAL CAPITAL INVESTMENT

The before tax Profit/TCI ratios on the defense and commercial business of the High and Medium volume companies are presented in Table IV-1, along with corresponding ratios of the FTC-SEC industrial comparison group companies. Table IV-1 also contains Profit/Sales ratios and TCI turnover ratios.

B. COMPARISON OF PROFIT/ECI AND PROFIT/TCI RATIOS

Table IV-2 is a presentation of the before tax Profit/ECI ratios on the defense and commercial business of the High and Medium companies, and on the FTC-SEC companies. The ECI turnover ratios and the Profit/Sales ratios are also shown. These ratios show the earnings on the investment of the owners (stockholders) of the companies. They do not reflect the amount of any borrowed capital.

Chart IV-3 depicts the trend of the Profit/TCI ratios in comparison with the Profit/ECI ratios on the defense business of the High and Medium volume companies. The trends are comparable from 1958 through 1966. The divergence in 1967 is caused by a sharp increase in the proportion of debt capital to equity capital in that year.

Chart IV-4 is a graphic depiction of the proportion of long-term debt to equity capital over the 10-year period 1958 - 1967. Chart IV-4 also contains the ratios of total debt (including short-term debt) to ECI.

The relationship of Defense to FTC-SEC profit ratios is shown in Chart IV-5. An increase in the percentage of long-term debt to equity capital was experienced by both the defense and FTC-SEC companies in 1967. As a result, the relationship of the defense Profit/ECI ratio to the FTC-SEC Profit/ECI ratio does not differ significantly in 1967 from the corresponding comparative Profit/TCI ratios. It will be observed that the comparison of Profit/ECI ratios with FTC-SEC Profit/ECI ratios would not have resulted in any meaningful difference over the comparison of Profit/TCI ratios to reflect the trends of profit on defense vs. FTC-SEC business over the 10-year period. However, the use of Profit/ECI ratios would have failed to disclose the impact of the relative increase in 1967 in long-term borrowings by both the defense and FTC-SEC companies.

C. PROFIT/TCI RATIOS - DEFENSE BUSINESS

1. High Companies vs. Medium Companies

The ratios of profit to total capital on the defense business of the High volume companies and those of the Medium volume companies are presented in Table IV-6. The ratios are also depicted graphically in Chart IV-7.

The Profit/TCI ratios of the Medium companies have been below those of the High companies throughout the 10-year period. The Medium companies' average dropped in 1964 to 10 percentage points below that of the High companies. Since 1964 the Medium companies' ratios have increased in every year while those of the High companies declined in both 1966 and 1967. In 1967, the two ratios were at their closest point: 13.7% for the High and 11.5% for the Medium volume companies.

It will be observed from Table IV-6 that the Medium companies' ratios are lower than those of the High companies' primarily because of a lower average TCI turnover rate throughout the period. However, the wider gaps in 1964 and 1965 were caused by sharp drops in the Medium company Profit/Sales ratios.

2. <u>Companies under 13.02% Profit/TCI vs. Companies over 13.02% Profit/TCI--1967 Defense Business</u>

The High and Medium volume companies were separated into those below the average Profit/TCI ratio (13.02%) of all the High and Medium companies in 1967, and those above that average. That grouping resulted in the following 1967 ratios:

	Average of Companies below 13.02% Profit/TCI	Average of Companies above 13.02% Profit/TCI
Profit/TCI	6.91%	20.29%
Sales/TCI (TCI Turnover)	2.69	3.64
Profit/Sales	2.57%	5.56%

Approximately one-half of the companies fell below and one-half above the 13.02% Profit/TCI ratio. In other words, the Profit/TCI of the median company is roughly the same as that of the mean. However, the companies below the mean accounted for 60% of the total TCI of all the companies, while those above the mean accounted for only 40% of total TCI.

D. ALTERNATE METHODS OF COMPUTING RETURN ON CAPITAL

After the initial report on this study was published, several suggestions were made to LMI regarding the definition of profit on total capital; among them were:

1. Average the capital, using beginning and end of year balances (This study used end-of-year balance);

2. Include short-term debt in total capital (This study used equity and long-term debt only); and

3. Use profit before interest costs (This study used profit after deduction of interest costs).

Although LMI has not changed its definitions, it did seem desirable to test each recommendation to determine to what extent, if any, different definitions would impact on the study findings. The results are presented in Table IV-8, in which the defense and FTC-SEC ratios have been recomputed using the alternate definitions as noted.

The fourth alternative on Table IV-8, which defines "capital" as "the average of equity capital plus long-term and short-term debt," and "profit" as "profit before interest," combining the suggestions listed above, is presented graphically in Chart IV-9. It will be noted that changes in both the defense and FTC-SEC ratios result in about the same relationships between them as existed in the LMI Profit Study ratios, and hence with similar resulting trends.

PROFIT ON TOTAL CAPITAL INVESTMENT

High and Medium Volume Companies
Before Tax

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Defense Business										
Profit/Sales (%)	5.37	5.07	4.53	4.26	4.24	3.92	3.97	4.84	4.47	4.17
TCI Turnover	3.8	3.8	3.8	3.4	3.4	3.2	3.1	3.0	2.9	3.1
Profit/TCI (%)	20.38	19.06	16.99	14.63	14.34	12.54	12.18	14.30	12.97	13.02
Commercial Business										
Profit/Sales (%)	6.63	6.67	4.29	5.88	8.15	8.43	9.61	10.11	9.16	6.38
TCI Turnover	2.0	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.2	2.1
Profit/TCI (%)	13.38	13.84	9.19	13.17	18.07	17.15	20.56	21.38	19.71	13.43
FTC/SEC Data										
Profit/Sales (%)	7.1	8.9	7.8	7.7	8.9	9.1	9.5	10.4	10.0	8.7
TCI Turnover	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1
Profit/TCI (%)	14.1	18.8	15.9	15.1	18.5	19.2	20.4	23.1	22.6	18.2

(Columns will not multiply due to weighting.)

Table IV-1

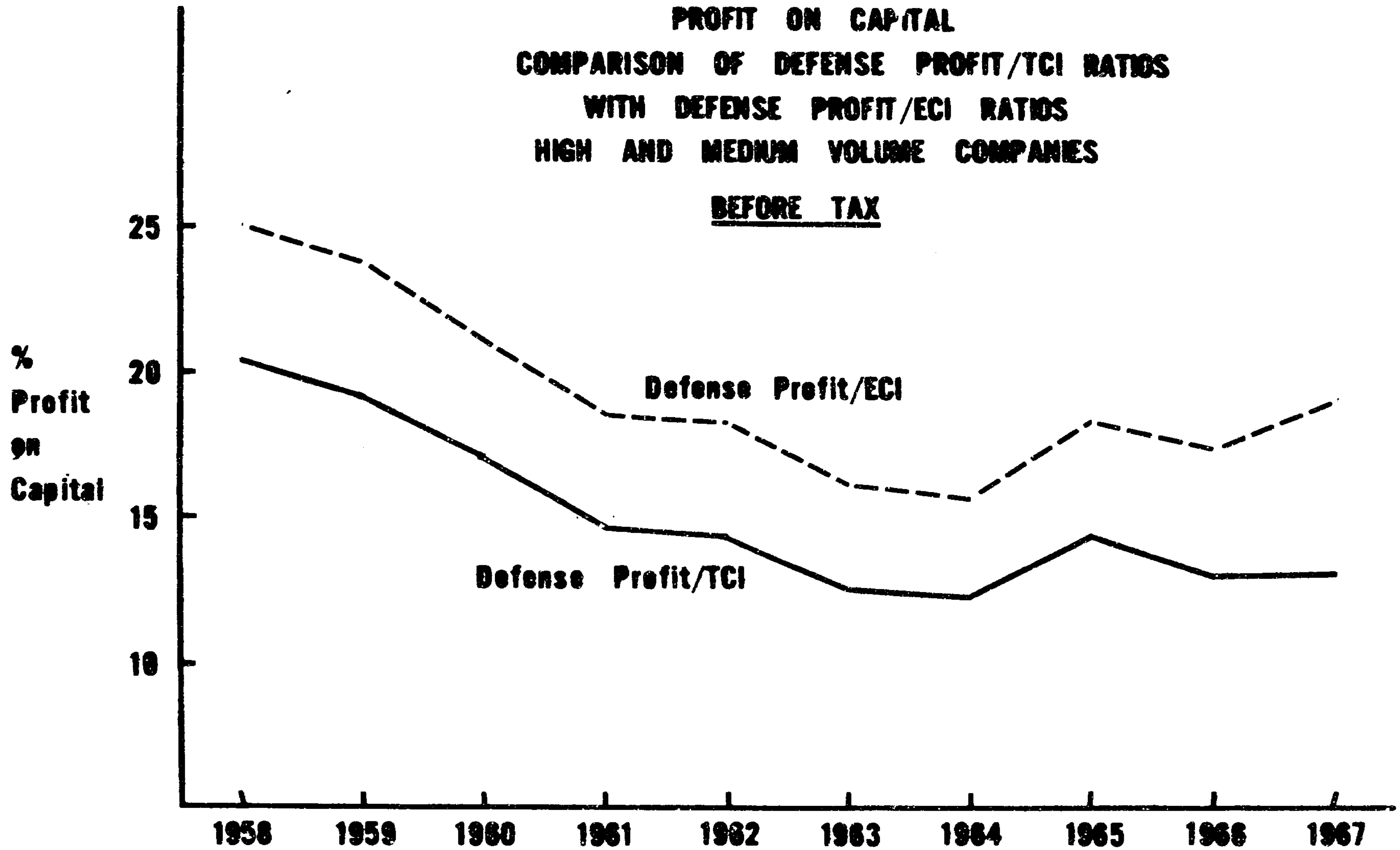
PROFIT ON EQUITY CAPITAL INVESTMENT

High and Medium Volume Companies
Before Tax

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Defense Business										
Profit/Sales (%)	5.37	5.07	4.53	4.26	4.24	3.92	3.97	4.84	4.47	4.17
ECI Turnover	4.7	4.7	4.6	4.3	4.3	4.1	3.9	3.8	3.9	4.5
Profit/ECI (%)	25.01	23.66	21.06	18.46	18.33	16.14	15.56	18.21	17.44	18.90
Commercial Business										
Profit/Sales (%)	6.63	6.67	4.29	5.88	8.15	8.43	9.61	10.11	9.16	6.38
ECI Turnover	2.6	2.7	2.7	2.9	2.9	2.7	2.8	2.8	3.0	3.1
Profit/ECI (%)	17.31	17.71	11.76	16.84	23.53	23.07	27.35	28.71	27.49	19.52
FTC/SEC Data										
Profit/Sales (%)	7.1	8.9	7.8	7.7	8.9	9.1	9.5	10.4	10.0	8.7
ECI Turnover	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.6	2.7	2.6
Profit/ECI (%)	16.5	21.9	18.5	17.8	21.9	22.6	24.1	27.4	27.1	22.5

(Columns will not multiply due to weighting.)

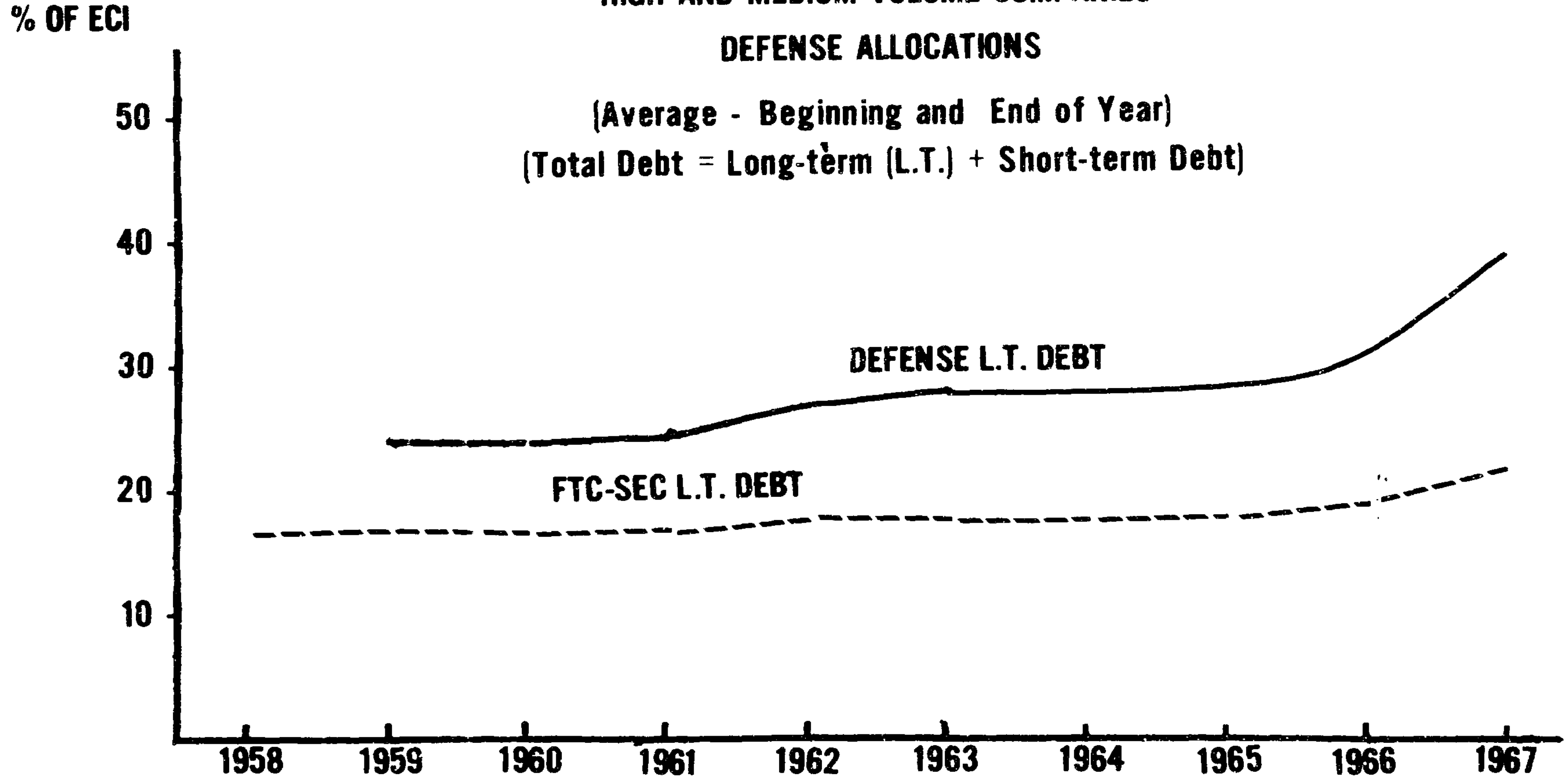
Table IV-2



Defense:	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Profit/TCI	20.4	19.[illegible]	17.0	14.6	14.3	12.5	12.2	14.3	13.0	13.0
Profit/ECI	25.0	23.7	21.1	18.5	18.3	16.1	15.6	18.2	17.4	18.9

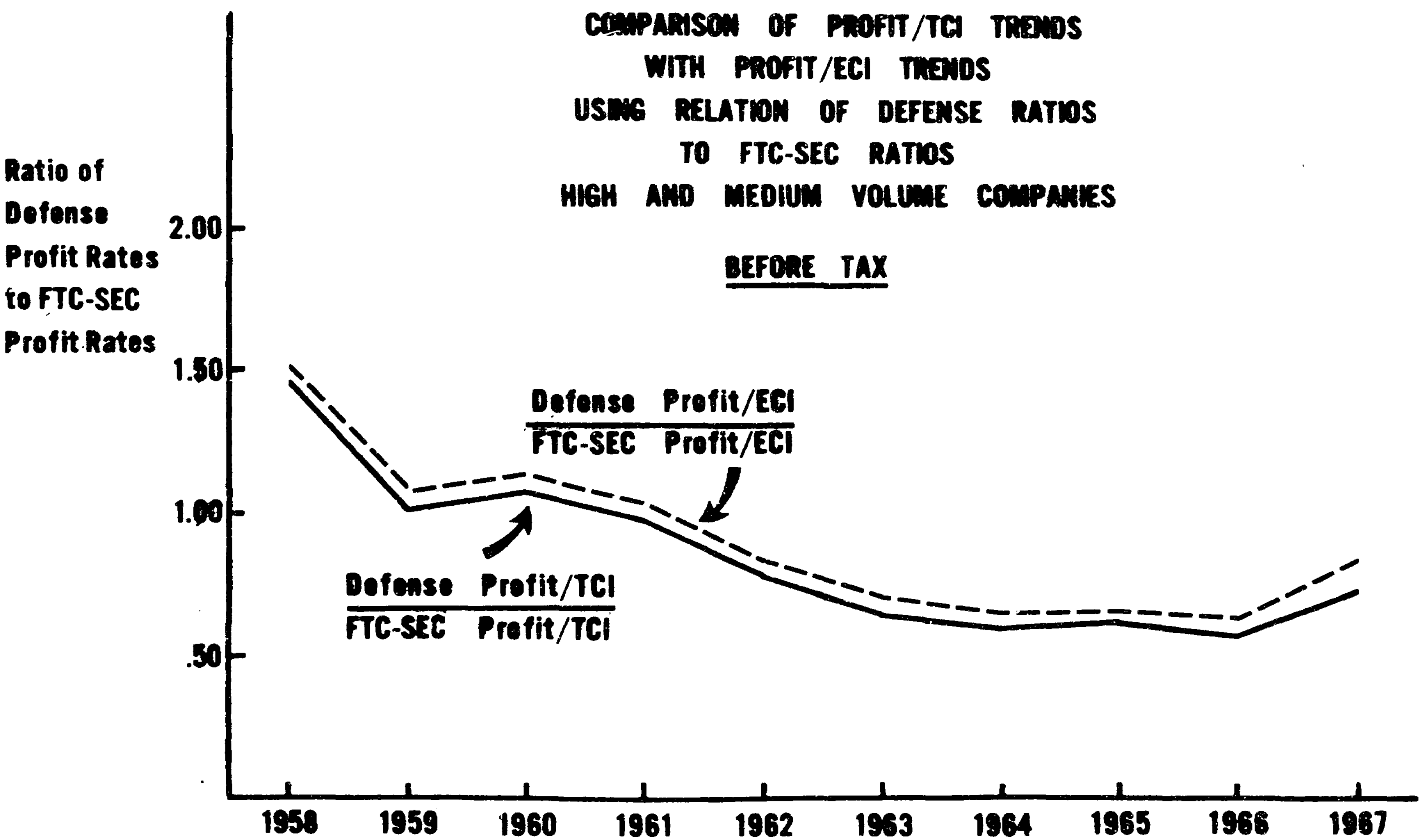
Chart IV-3

DEBT TO EQUITY CAPITAL
HIGH AND MEDIUM VOLUME COMPANIES
DEFENSE ALLOCATIONS
(Average - Beginning and End of Year)
(Total Debt = Long-term (L.T.) + Short-term Debt)



	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Defense										
Tot. Debt/ECI %	N/A	41.5	42.9	43.3	43.0	41.3	37.9	36.6	44.7	59.6
L.T. Debt/ECI %	N/A	23.5	24.1	25.3	27.0	28.2	28.2	27.7	31.2	39.2
FTC-SEC										
Tot. Debt/ECI %	23.8	23.5	24.2	24.7	24.7	24.5	24.3	25.3	28.7	32.8
L.T. Debt/ECI %	17.1	17.0	16.8	17.3	17.9	18.0	17.9	18.1	19.3	22.0

Chart IV-4



Def. to FTC-SEC	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Profit/TCI	1.45	1.01	1.07	.97	.78	.65	.60	.62	.57	.72
Profit/ECI	1.52	1.08	1.14	1.04	.84	.71	.65	.66	.64	.84

Chart IV-5

PROFIT ON TOTAL CAPITAL INVESTMENT

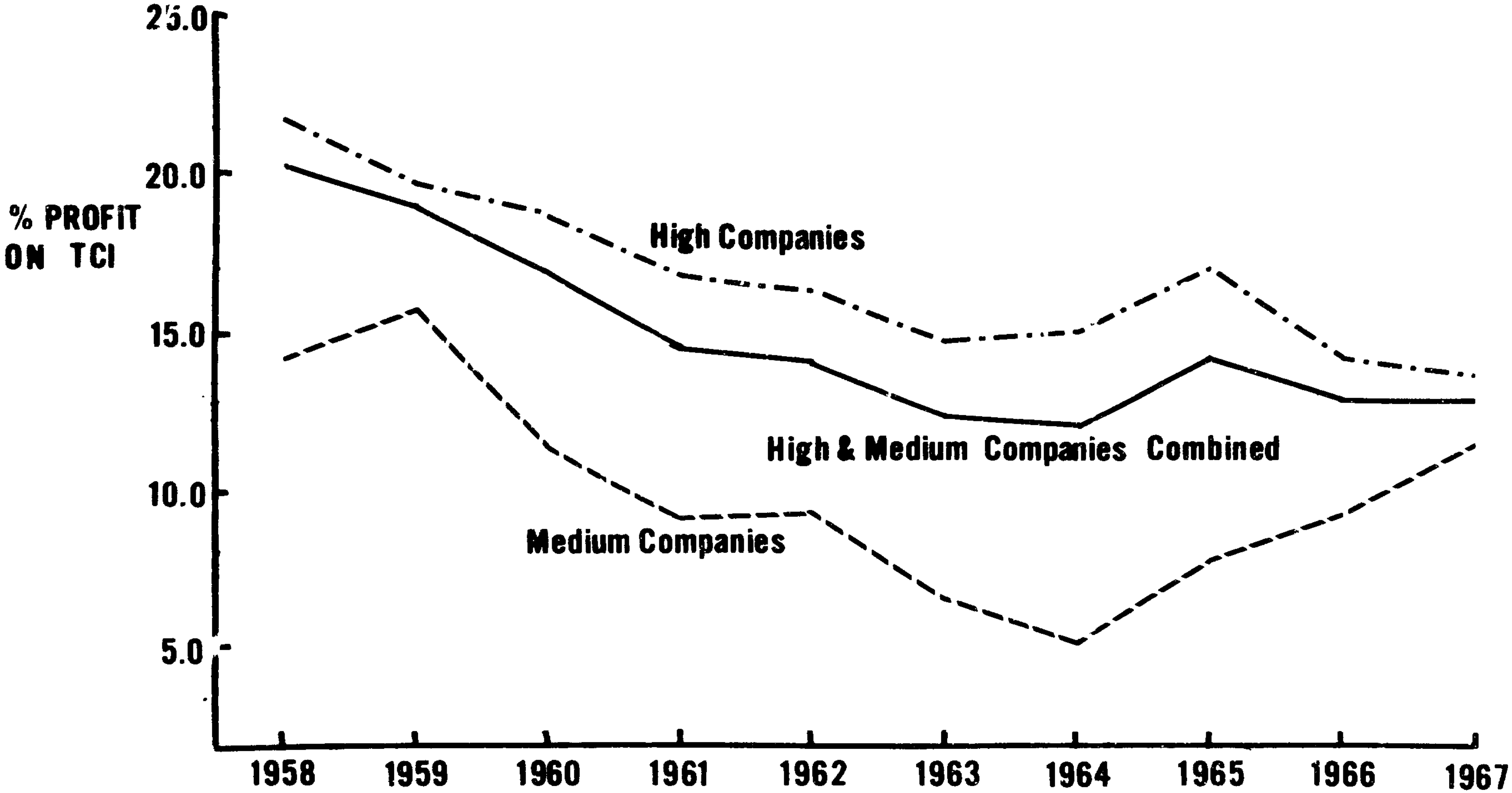
High and Medium Volume Companies
Defense Business - Before Tax

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
High Volume Companies										
Profit/Sales (%)	5.41	5.02	4.58	4.33	4.26	4.10	4.31	5.12	4.54	4.04
TCI Turnover	4.0	4.0	4.1	3.9	3.9	3.6	3.5	3.3	3.2	3.4
Profit/TCI (%)	21.80	19.85	18.61	16.88	16.41	14.90	15.01	17.06	14.39	13.66
Medium Volume Companies										
Profit/Sales (%)	5.13	5.33	4.30	3.99	4.14	3.14	2.57	3.80	4.24	4.59
TCI Turnover	2.8	3.0	2.7	2.3	2.3	2.1	2.1	2.1	2.2	2.5
Profit/TCI (%)	14.19	15.80	11.52	9.24	9.40	6.63	5.31	7.88	9.43	11.46

(Columns will not multiply due to rounding)

Table IV-6

RATIO OF PROFIT TO TOTAL CAPITAL INVESTMENT
HIGH AND MEDIUM VOLUME COMPANIES
DEFENSE-BUSINESS
BEFORE TAX



	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
High Cos.	21.8	19.8	18.8	16.9	16.4	14.9	15.0	17.1	14.4	13.7
Med. Cos.	14.2	15.8	11.5	9.2	9.4	6.6	5.3	7.9	9.4	11 5
H&M Cos.	20.4	19.1	17.0	14.6	14.3	12.5	12.2	14.3	13.0	13.0

Chart IV-7

EFFECT OF USING ALTERNATE DEFINITIONS OF CAPITAL AND PROFIT
ON DEFENSE PROFIT/TCI

High and Medium Companies

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
High and Medium Companies:										
Profit/TCI per LMI Report	20.4	19.1	17.0	14.6	14.3	12.5	12.2	14.3	13.0	13.0
Alt. #1 Profit/Average TCI		19.7	16.9	15.7	15.0	12.7	11.8	14.2	14.1	13.7
Alt. #2 (Profit + Interest onLong-term debt)/TCI		19.9	17.9	15.5	15.3	13.5	13.2	15.3	14.0	14.3
Alt. #3 (Profit + Interest onLong-term debt)/Average TCI		20.6	17.8	16.6	15.9	13.7	12.8	15.2	15.2	14.9
Alt. #4 (Profit + Interest on All debt)/Average (TCI + Short-term debt)		18.5	16.5	14.9	14.5	12.7	12.2	14.5	14.3	13.6
FTC-SEC Companies:										
Profit/TCI per LMI Report	14.1	16.8	15.9	15.1	18.5	19.2	20.4	23.1	22.6	18.2
Alt. #1 as above	14.2	19.4	16.4	15.5	19.1	19.6	21.0	24.4	24.0	19.3
Alt. #2 "	14.7	19.4	16.5	15.8	19.2	19.8	21.1	23.9	23.3	19.0
Alt. #3 "	14.9	20.0	17.1	16.2	19.8	20.3	21.7	25.1	24.8	20.1
Alt. #4 "	14.2	19.2	16.3	15.4	18.9	19.5	20.8	23.9	23.4	18.9

NOTE: Defense Short term debt data were derived from published statements and allocated on basis of Defense TCI/Total TCI, each company. Interest Rates were derived from the Economic Report of the President, 1968. For Long-term debt, LMI used 10-year (1958-67) average rate on Aaa Bonds. For short-term debt, LMI used Annual Average rates on Prime Commercial paper. Same rates applied to FTC-SEC debt. Data were not available to compute alternates for 1958 on the LMI Sample companies.

Table IV-8

RATIO OF PROFIT TO TOTAL CAPITAL INVESTMENT

SOLID LINES DENOTE: PROFIT/TCI PER LMI REPORT

DOTTED LINES DENOTE: (PROFIT PLUS INTEREST) / (AVERAGE TCI PLUS SHORT TERM DEBT)

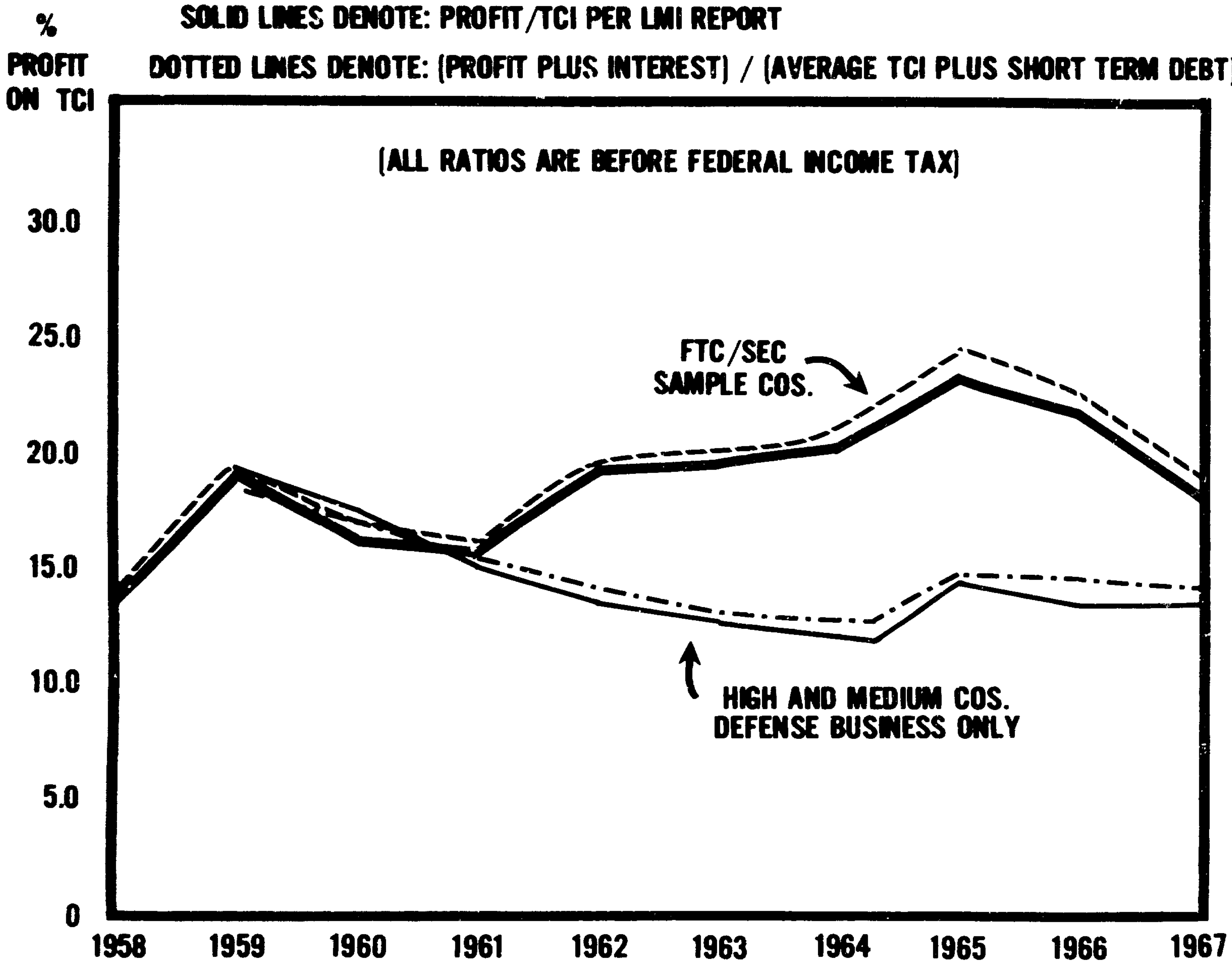


Chart IV-9

SECTION V

CAPITAL TURNOVER

A. COMPARISON OF DEFENSE AND COMMERCIAL CAPITAL TURNOVER (SALES/CAPITAL) RATIOS

The ratios of sales to TCI (and ECI) on the defense and commercial business of the High and Medium volume companies and on the total business of the FTC-SEC companies are presented in Table V-1. The table also contains sales and capital dollar volumes by years.

TCI turnover on the defense business of the High and Medium volume companies declined steadily from 3.S in 1958 to 2.9 in 1966. The ratio rose to 3.1 in 1967. The Sales/TCI ratio on the commercial business of these companies and the corresponding FTC-SEC ratio have remained fairly level throughout the 10-year period, averaging from 2.0 to 2.2.

Capital turnover ratios express the relationship between sales volume and capital investment. In the 10-year period 1958 through 1967, the volume of both sales and TCI increased in all categories: defense, commercial and FTC-SEC. In the case of defense business, however, TCI was 70% greater in 1967 than it was in 1958, while sales volume in 1967 was only 41% greater than 1958. The percentage increases in commercial and FTC-SEC capital over the 10-year period were a little less than the increases in sales for those categories.

The increase in defense TCI between 1958 and 1967 beyond the increase in defense sales is illustrated by comparing the defense TCI/Sales ratios for the two years.

	Defense TCI/Sales		
	1958	1967	% Increase
High & Medium Volume Companies	26.38	32.00	21.3

To determine what factors caused the increase in the defense TCI/Sales ratio, LMI analyzed the financial statements of 18 of the 40 sample companies. The data apply to total company business. Defense business constituted more than half of the total business of the 18 companies in both periods. The companies included were those which submitted 1967 data early and had no significant mergers or acquisitions during the period that might have distorted the base. Results of the analysis follow:

	18 High & Medium Cos.		
	1958	1967	% Increase
TCI/Sales (Defense Business %)	26.78	32.46	21.2
Net Working Capital/Sales (Total Co. %)	17.50	17.65	0.9
Facilities (Net Book Value)/Sales (Total Co. %)	14.87	21.66	45.6
(Net Wkg. Capital+Facilities at NBV)/Sales (Total Co. %)	32.37	39.31	21.4

For comparison purposes, the data of the FTC-SEC industrial comparison group wereanalyzed in a similar manner, as follows:

	FTC-SEC		
	1958	1967	% Increase (Decrease)
Net Working Capital/Sales (%)	25.7	22.6	(12.06)
Facilities (Net Book Value)/Sales (%)	20.9	21.7	3.83
(Net Working Capital + Facilities at NBV)/Sales (%)	46.6	44.3	(4.94)

Half of the 18 defense companies showed an increase in the percentage of net working capital to sales over the ten-year period. The High volume companies in the 18 company sample had a lower average Net Working Capital/Sales ratio in 1967 than in 1958. The Medium volume companies' ratio of working capital to sales was higher in 1967 than in 1958.

Fourteen of the 18 companies had an increase in the ratio of facilities to sales over the same period. The average increase of High volume companies was 61.4%, from 8.8% in 1958 to 14.2% in 1967. The average increase of Medium volume companies was 41.2%, from 18.2% to 25.7% Facilities/Sales.

B. RANGE DATA - TCI TURNOVER

The range of the Sales/TCI ratios can be found in Table V-2. As might be expected, the range of the defense ratios is wider than that on commercial business. In 1967, the weighted averages and the 10th and 90th percentiles, based on TCI, were as follows:

	Weighted Average (Mean)	Percentiles of TCI 10th - 90th
Defense	3.1	2.2 - 5.0
Commercial	2.1	1.2 - 3.5

In both cases the range below the mean is narrower than that above the mean, 0.9 against 1.9 in defense business, and 0.9 against 1.4 in the case of commercial business. The distribution of the defense Sales/TCI ratio for 1967 can be found in Chart V-3.

C. DEFENSE CAPITAL REQUIREMENTS

Capital invested in defense business generally is represented by two types of assets:

(1) Net Working Capital, which is current assets (cash, accounts receivable, inventories) minus current liabilities (accounts payable, short-term debt, accruals); and

(2) Facilities, which are land, buildings and equipment at net book value (cost less reserves for depreciation).

Company capital in defense business often is supplemented by capital provided by the Government, which consists of both working capital (progress payments and cost reimbursements) and facilities.

LMI has estimated the total defense capital requirements (DCR) for 1967 of the High and Medium volume companies, including both company-owned and Government-furnished capital. The results are depicted in the following table, in which each category of capital (company and Government) is separated into the assets it represents, i.e. net working capital and facilities.

High and Medium Companies	Percent of Defense Sales		Percent of DCR	
Company Capital (Defense TCI)	32.0		47.5	
Net Working Capital		20.7		30.7
Facilities at Net Book Value		11.3		16.8
Government Capital	35.4		52.5	
Net Working Capital[1]		31.5		46.7
Facilities at Net Book Value[2]		3.9		5.8
Total Defense Capital Requirements (DCR)	67.4		100.0	
Net Working Capital		52.2		77.4
Facilities at Net Book Value		15.2		22.6

[1] Average outstanding progress payments for the year from DoD data, plus an estimate by LMI of cost reimbursements.

[2] As computed by the companies, using their depreciation policies and rates.

If the ratios of High and Medium volume companies are computed separately the average DCR of the High companies is 68.1% and the average DCR of the Medium companies is 65.0% of defense sales.

Several observations can be made from perusal of the above figures:

1. Company capital (Defense TCI) constitutes, on the average, approximately half of the DCR of the High and Medium volume companies.

2. The average total defense capital requirement (DCR) as a percentage of sales does not vary appreciably between the High and Medium volume categories of companies.

3. The major capital contribution of the Government is working capital (progress payments and cost reimbursements). On the average, Government facilities are a relatively small part of total defense capital requirements.

D. <u>SALES/TCI RATIOS - DEFENSE BUSINESS</u>

1. <u>High Companies vs. Medium Companies</u>

The defense Sales/TCI (TCI Turnover) ratios of the High companies and those of the Medium companies are shown in Chart V-4. It will be noted that the ratios of the Medium volume companies have been below those of the High companies throughout the 10-year period.

Analysis of the 1967 defense Sales/TCI and defense Sales/DCR ratios of the High and Medium volume companies shows the following:

	High Companies		Medium Companies	
Sales/TCI (TCI Turnover)	3.38		2.50	
Sales/DCR (DCR Turnover)	1.47		1.54	
Company Capital/Sales (%)	29.6		40.1	
Net Working Capital/Sales (%)		19.0		26.3
Facilities/Sales (%)		10.6		13.8
Government Capital/Sales (%)	38.5		24.9	
Net Working Capital/Sales (%)		35.0		19.7
Facilities/Sales (%)		3.5		5.2
TCI/DCR (%)	43.5		61.7	

It can be observed that while the difference in total defense capital requirements is insignificant, the Medium companies are receiving a lesser proportion of Government support than are the High volume companies, 24.9% of sales compared with 38.5% of sales. The difference is in Government working capital (progress payments and cost reimbursements), where the High company balances average 35.0% of sales while the average balance of the Medium companies is only 19.7%.

2. Companies under 3.12 Sales/TCI vs. Companies over 3.12 Sales/TCI in 1967 Defense Business

The average defense business TCI turnover rate for the High and Medium companies in 1967 was 3.12. The companies are divided into two groups, those above and those below that rate, in the following table:

High and Medium Companies	Average of Companies Below 3.12 Sales/TCI	Average of Companies Above 3.12 Sales/TCI
Sales/TCI (TCI Turnover)	2.30	4.42
Profit/Sales (%)	4.04	4.27
Profit/TCI (%)	9.28	18.90

The Profit/Sales ratios of the two groups are approximately equal. The difference in the Profit/TCI ratios is due almost entirely to the wide difference in TCI turnover, the average of the upper group being almost twice that of the lower group.

3. Companies under 1.48 Sales/DCR vs. Companies over 1.48 Sales/DCR in 1967 Defense Business

The effect of Government capital was examined by separating the High and Medium companies into those above and those below the 1967 Sales/DCR average of 1.48. The results are:

High and Medium Companies	Average of Companies Below 1.48 Sales/DCR		Average of Companies Above 1.48 Sales/DCR	
Sales/DCR (DCR Turnover)	1.22		1.91	
Sales/TCI (TCI Turnover)	2.78		3.58	
Company Capital/Sales (%)	36.00		27.93	
Net Working Capital/Sales (%)		23.46		17.84
Facilities/Sales (%)		12.54		10.09
Government Capital/Sales (%)	46.05		24.39	
Net Working Capital/Sales (%)		41.63		20.99
Facilities/Sales (%)		4.42		3.40
Government Capital/DCR (%)	56.12		46.63	
Company Capital (TCI)/DCR (%)	43.88		53.37	

The above figures show that, on the average, the Government provides a larger share of the capital in those companies which have a lower Sales/DCR ratio. The figures do not, however, reflect the distribution of Government capital among individual companies. Many of the companies in the lower Sales/DCR group receive relatively little Government capital. Many of those in the higher Sales/DCR group have most of their DCR provided by the Government.

Individual company DCR turnover and TCI turnover were plotted on the same graph. While it can be observed from the graph that, in general, companies with higher DCR turnover have higher TCI turnover, it also is clear that in all parts of the DCR turnover range there are both companies with very high TCI turnover and companies with very low TCI turnover. Plotting of Government Capital/Sales and DCR turnover on another graph also showed the large differences in the effect of Government capital on companies with approximately equal DCR turnover.

The graphs which were plotted cannot be shown because they reveal data which perhaps could be associated with specific companies. Curves could be fitted to the data, but they would fail to demonstrate the large differences in the effect of Government capital on individual companies; so they would omit the most outstanding feature of the plots.

Government provision of capital cannot be regarded as a means for achieving more nearly equal capital requirements. It narrows some capital requirement differences but it widens others. This is not to say that DoD policies on providing facilities, making cost reimbursements, or giving progress payments are unsound. Those policies have purposes other than profit, and in the achievement of those purposes the impact on profit is not uniform among companies. The resulting differences in profit on capital can only be compensated for by different Profit/Sales ratios for companies with different capital requirements.

E. UNBILLABLE COSTS - 1967

In its previous report, LMI noted that many company officials cited "unbillable" costs as significantly reducing capital turnover. Those costs are generally recoverable, but recovery is delayed pending contractual authority.

The companies were requested to furnish data on this matter in 1967. Thirty-three companies were able to submit breakdowns. Unbillable costs totaled $709.1 million, or 13.5% of the total defense TCI of the reporting companies. The principal unbillables were unpriced change orders.

Six companies reported unbillable costs in excess of 25% of their defense TCI. In three of these six companies the unbillable costs were in excess of 35% of defense TCI.

RATIO OF SALES TO CAPITAL INVESTMENT
(CAPITAL TURNOVER)

High and Medium Volume Companies
Averages Weighted by Company Capital
($ in billions)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Defense Business										
Sales ($)	12.706	13.372	13.281	14.212	15.380	14.882	13.500	12.759	14.738	17.895
BCI ($)	2.671	2.814	2.769	3.145	3.404	3.463	3.325	3.297	3.684	3.887
BCI Turnover	4.7	4.7	4.6	4.3	4.3	4.1	3.9	3.8	3.9	4.5
TCI ($)	3.267	3.486	3.416	3.942	4.316	4.425	4.184	4.123	4.911	5.556
TCI Turnover	3.8	3.8	3.8	3.4	3.4	3.2	3.1	3.0	2.9	3.1
Commercial Business										
Sales ($)	6.044	6.971	8.193	8.116	8.452	8.504	9.707	11.334	13.537	17.631
BCI ($)	2.357	2.680	3.012	2.881	2.953	3.123	3.447	4.020	4.590	5.745
BCI Turnover	2.6	2.7	2.7	2.9	2.9	2.7	2.8	2.8	3.0	3.1
TCI ($)	3.006	3.395	3.836	3.661	3.786	4.101	4.464	5.283	6.290	8.249
TCI Turnover	2.0	2.1	2.1	2.2	2.2	2.0	2.1	2.1	2.2	2.1
FTC/SEC Data										
Sales ($)	107.6	121.4	127.0	128.9	145.1	155.0	167.0	191.5	220.1	230.4
BCI ($)	46.2	49.6	53.2	55.4	59.1	62.2	66.2	72.6	81.6	89.2
BCI Turnover	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.6	2.7	2.6
TCI ($)	54.1	57.8	62.1	65.2	70.0	73.4	77.9	86.0	97.9	110.4
TCI Turnover	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1

(Columns will not multiply due to weighting)

Table V-1

WEIGHTED AVERAGES AND RANGE DATA
SALES/TOTAL CAPITAL INVESTMENT
(TCI TURNOVER)
High and Medium Volume Companies

	DEFENSE[1]				COMMERCIAL[2]			
Year	Average	Percentiles 10th		90th	Average	Percentiles 10th		90th
1958	3.79	1.78	-	6.40	2.02	1.34	-	2.83
1959	3.76	1.77	-	6.23	2.07	1.44	-	2.63
1960	3.75	1.59	-	6.00	2.14	1.47	-	3.28
1961	3.43	1.50	-	5.51	2.23	1.50	-	3.42
1962	3.39	1.41	-	6.85	2.22	1.55	-	3.01
1963	3.20	1.69	-	5.30	2.04	1.20	-	2.72
1964	3.07	1.75	-	5.55	2.14	1.18	-	3.18
1965	2.95	1.61	-	5.71	2.12	1.18	-	3.56
1966	2.90	1.55	-	5.58	2.15	1.71	-	2.45
1967	3.12	2.24	-	4.98	2.10	1.21	-	3.48

[1] Averages and percentiles calculated on a weighted basis, by companies' defense TCI.

[2] Averages and percentiles calculated on a weighted basis, by companies' commercial TCI.

Table V-2

DISTRIBUTION OF DEFENSE TOTAL CAPITAL TURNOVER RATIOS

High And Medium Volume Companies

1967

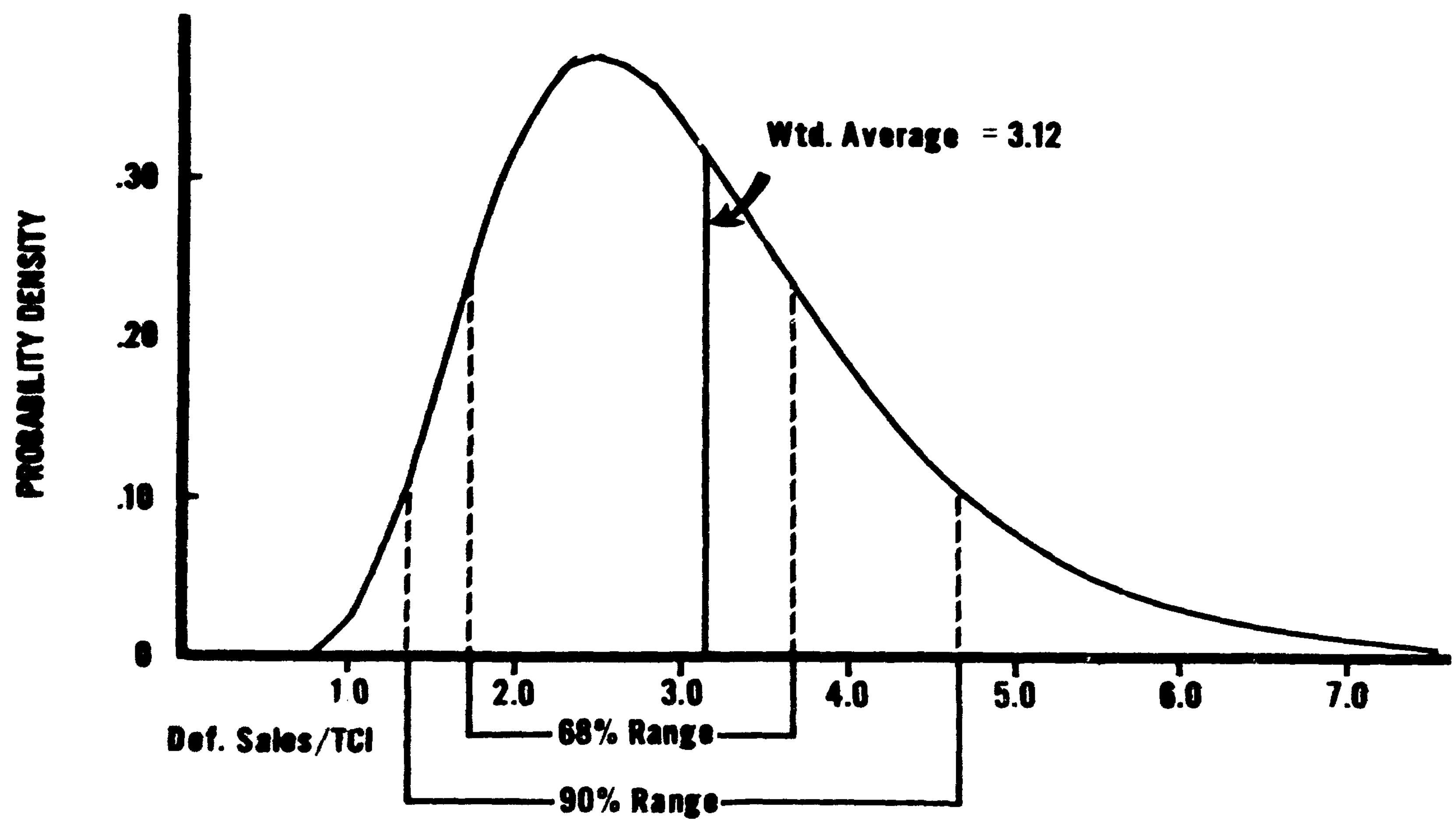
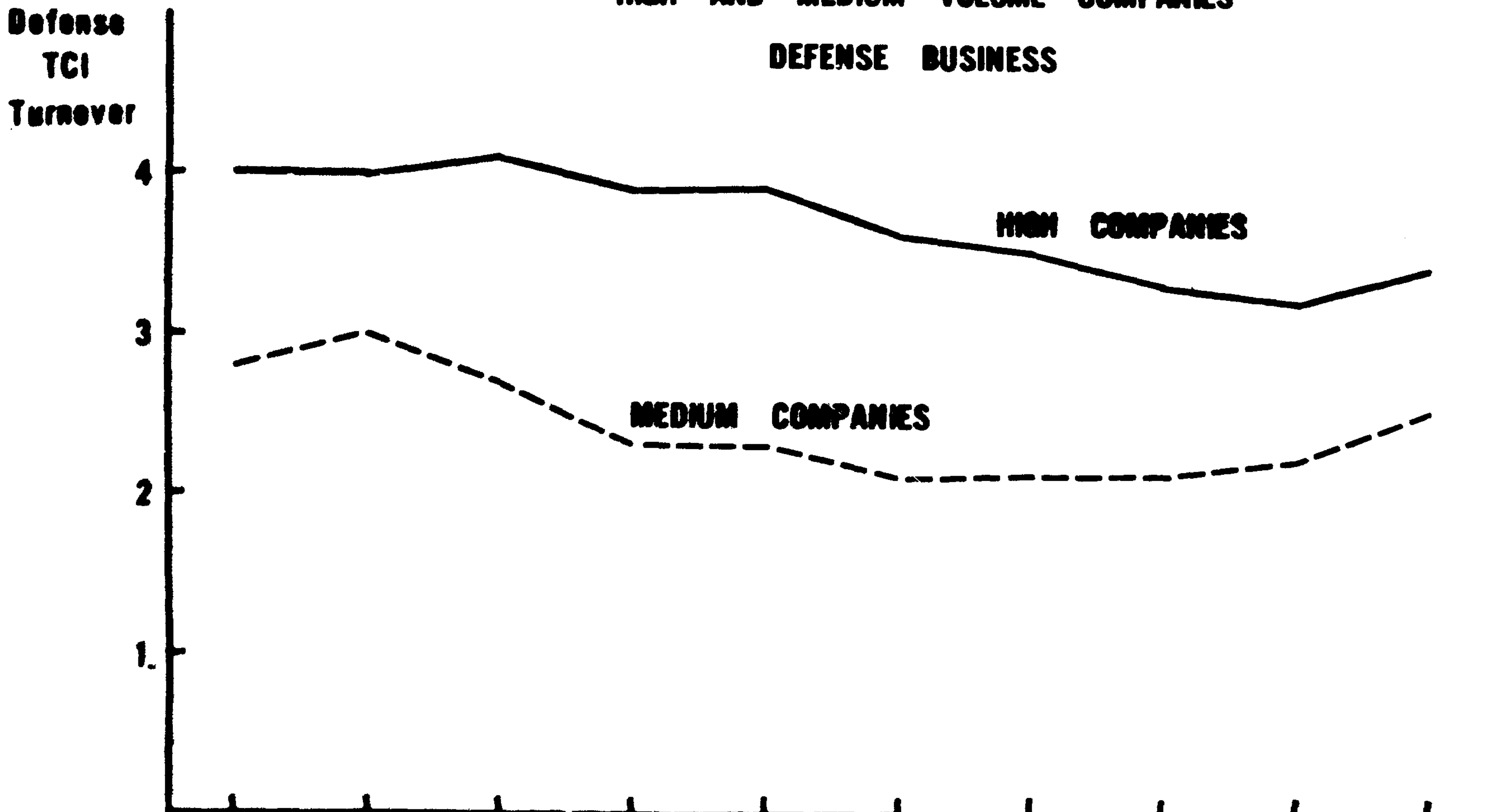


Chart V-3

RATIO OF SALES TO TOTAL CAPITAL INVESTMENT
(TCI TURNOVER)

HIGH AND MEDIUM VOLUME COMPANIES

DEFENSE BUSINESS



	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
High Cos.	4.0	4.0	4.1	3.9	3.9	3.6	3.5	3.3	3.7	3.4
Med Cos.	2.8	3.0	2.7	2.3	2.3	2.1	2.1	2.1	2.2	2.5

Chart V-4

SECTION VI

PROFIT ON SALES

A. COMPARISON OF DEFENSE AND COMMERCIAL PROFIT/SALES RATIOS

The ratios of profit to sales on the defense, commercial and other Government business of the High and Medium volume companies is presented at Chart VI-1, which also contains similar ratios on the FTC-SEC industrial comparison group.

Defense Profit/Sales ratios trended downward from 5.37% in 1958 to 3.97% in 1964. The ratios increased to 4.84% in 1965; they declined to 4.47% in 1966 and to 4.17% in 1967. Despite a 10% recovery from the 1962-64 weighted average (4.0%), the weighted average (4.5%) for the 3-year period 1965-67 was still 10% below the weighted average (5.0%) for the period 1958-60.

The Profit/Sales ratios on the commercial business of the defense companies have been more volatile than the ratios on their defense business. The commercial ratios have ranged from a low of 4.29% to a high of 10.11%, while the defense ratios have fluctuated between 3.92% and 5.37%.

The wide variation in the commercial Profit/Sales ratios is influenced by the profits or losses of a few large companies, and to a large degree by the method of pricing certain commercial products. For example, in both defense and commercial business, development and high initial production costs on aircraft are charged off as the costs are incurred. As a result, early production aircraft will cost much more than those produced later, the costs decreasing along a predictable curve.

In the case of defense business, development costs are paid as incurred and starting load costs are amortized over the initial contract lot only. Hence the price of first production items are higher than follow-on items, with the price of each succeeding lot reflecting its lower costs. As a result, defense sales and the related profits are likely to be booked in the same time period.

It is not practicable to charge high early costs to the first buyer of commercial aircraft. Hence development and starting load costs are recovered over a large quantity so that the prices to buyers of early production items and prices to buyers of later ones will be roughly equivalent. Since the production of these aircraft will extend over several years, the company will have low profits or losses in the first years when costs are high, and higher profits in later years when costs are lower, the sales prices being the same in both periods.

The differences in pricing methods should not be interpreted as favoring either defense or commercial customers. The difference is merely one of time, i.e., <u>when</u> the costs are recovered in sales. Over a total program both methods should produce essentially the same cost recovery. However, for comparing commercial profits with defense profits, it may be more meaningful to use longer periods of time, so as to reduce distortions that may exist in the annual commercial ratios.

The following table is derived from the Profit/Sales ratios in Chart VI-1. The annual ratios have been converted to 3-year running averages:

	% Profit/Sales		
	Defense	Commercial	FTC-SEC
1958-1960	5.0	5.8	8.0
1959-1961	4.6	5.6	8.1
1960-1962	4.3	6.2	8.2
1961-1963	4.1	7.5	8.6
1962-1964	4.0	8.8	9.2
1963-1965	4.2	9.4	9.7
1964-1966	4.4	9.6	10.0
1965-1967	4.5	8.3	9.7

Use of the 3-year averages makes the commercial ratios appear to have a more stable relationship to the FTC-SEC trends. (See Chart VI-2).

B. PROFIT/SALES RATIOS - DEFENSE BUSINESS

1. High Companies vs. Medium Companies

The defense Profit/Sales ratios may be analyzed by showing the ratios of the High companies and those of the Medium companies separately, as in Chart VI-3. With the exception of the years 1963, 1964, and 1965 the ratios of the two categories were quite close for the 10-year period, and the High company ranges generally fell within the Medium company ranges.

The ratios for the years 1962 through 1965 as shown on Chart VI-3 are as follows:

	High Companies	Medium Companies
1962	4.26	4.14
1963	4.10	3.14
1964	4.31	2.57
1965	5.12	3.80

The average ratios in 1962 were roughly equivalent. In 1963 and 1964 the High companies' ratios were stable, while the ratios of the Medium companies declined sharply. In 1965 both categories rose sharply, but since the Medium companies started with a low base, there was still a wide gap between the two.

The range of Profit/Sales ratios in the Medium company population is wider than that of the High volume companies (See Chart VI-4 and Tables VII-29 and VII-30). In 1962 through 1965, comparative 68% ranges[1] were as follows:

	High Companies	Medium Companies
1962	2.69 - 5.83	1.83 - 6.45
1963	2.52 - 5.68	0.77 - 5.51
1964	2.57 - 6.05	(0.45)- 5.59
1965	3.19 - 7.05	1.12 - 6.48

Those figures demonstrate that movement of the High and Medium company Profit/Sales averages in 1962-65 was not caused by the experience of a few companies, but reflected the general experience of those population categories. The Medium companies' average Profit/Sales ratio improved in 1966 and was higher in 1967 than that of the High companies.

2. Companies Under 4.17% Profit/Sales vs. Companies Over 4.17% Profit/Sales in 1967

The average defense Profit/Sales ratio for the High and Medium volume companies in 1967 was 4.17%. The companies are separated into two groups, those above and those below that ratio, in the following table:

---

[1] See Section VII for a discussion of ranges.

	Average of Companies Below 4.17% Profit/Sales	Average of Companies Above 4.17% Profit/Sales
Profit/Sales	2.50	6.62
Sales/TCI (TCI Turnover)	3.28	2.92
Profit/TCI	8.21	19.31

The companies in the lower than average group accounted for about 60% of defense sales. Despite a slightly higher TCI turnover rate, the substantially lower Profit/Sales ratio of that group resulted in a Profit/TCI ratio which was less than half that of the higher group.

C. DEFENSE PROFIT/SALES - PRIME CONTRACT VS. SUBCONTRACT

The defense Profit/Sales ratios, grouped by prime contract sales and subcontract sales, are presented in Chart VI-5. In 1967, 16 of the High volume companies and 15 of the Medium volume companies stratified their sales and profit data in this manner.[1] Total prime sales of the 31 companies were $11,776.6 million; subcontract sales totaled $1,392.8 million. The trends in Chart VI-5 do not indicate any substantial differences in profit on sales between the prime and subcontract business of the sample companies.

D. DEFENSE PROFIT/SALES - BY CONTRACT TYPE

Table VI-6 is an analysis of defense profits on sales by major type of contract. The data by contract type were submitted in 1967 by 36 companies which accounted for 93% of total defense sales of the sample companies.[1] The distribution of the Profit/Sales ratio by contract type for 1967 is shown at Chart VI-7.

[1] See November 1967 report for companies reporting in prior years.

Cost reimbursement type (CPFF, CPIF), contract sales showed higher Profit/Sales ratios in 1967 than in 1966. The trend of the ratios for those contracts has been upward for the past 5 years.

Fixed-price incentive (FPI) contracts took a sharp drop in the ratio of profit to sales in 1967, following a smaller decline in 1966. The volume of sales of FPI contracts increased in both years. In 1967, FPI volume was the highest of any contract type.

The Profit/Sales ratio of firm fixed-price (FFP) contracts rose slightly in 1967, but at 3.7% it was the lowest ratio of any type contract.

The price competitive ratios shown on Table VI-6 apply to contracts which also are included in the FPI and FFP data. Twenty-eight companies were able to report price competitive profit results in 1967. The submissions were based on contracts identified as price competitive by DoD and furnished by contract number to the sample companies. Hence they include only price competitive prime sales; no competitive subcontracts are included. Also, they may not include some prime contracts which the companies consider to be competitive, but which did not meet DoD's definition.

Since price competitive data were received from only 8, 13, 17, and 23 companies in the years 1958 through 1961 respectively, the significance of the competitive Profit/Sales ratios for those years can be questioned. For the same reason, the use of years prior to 1962 as a basis for measuring the trend of competitive sales in the High and Medium population may not be valid. Hence analysis was limited to 1962 and subsequent years.

Examination of the price competitive sales from 1962 through 1967 showed an upward trend both in dollars and in percentage of defense sales. The competitive sales dollars were found to be

150% higher in 1967 than they were in 1962.[1] The ratio of competitive sales to total defense sales in 1967 showed an increase of 108% over the corresponding 1962 ratio.

LMI analyzed the Profit/Sales ratios for 1967 on FPI and FFP contracts, of those companies whose ratios on these types were under the High and Medium company average of 4.17% on all defense sales. Of the 36 companies reporting profits by type of contract, 21 companies had Profit/Sales ratios under 4.17% on FPI contracts, or on FFP contracts, or on both. Of those 21 companies, 5 companies were under that ratio on FPI contracts only, 8 companies were under that ratio on FFP contracts only and 8 companies were under 4.17% Profit/Sales on both types. Thus, there were 29 separate FPI and FFP cases, involving 21 companies. There were net losses in 12 cases involving 11 companies.

From the data on hand, LMI was able to determine that losses or less than average profits on subcontracts were the entire cause in 3 cases, and a major factor in 5 other cases, of the lower than average profits on FPI and FFP contracts. Also, 19 of the 21 companies had losses or lower than average profits on their price competitive prime contract sales.

E. FIRM FIXED-PRICE CONTRACTS NEGOTIATED UNDER THE WEIGHTED GUIDELINES SYSTEM

LMI obtained a listing from DoD which showed all FFP contracts in the DoD data collection system[2] for the years 1964 through 1966. Contracts totalling $6,821 million were identified. From a total of 1,117 contracts, LMI selected a sample of 419 contracts totalling $2,109 million, which were awarded to companies participating in the LMI study. The contract numbers

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[1] After weighting the data to adjust for the difference in sample proportion between the High and Medium companies.

[2] See Introduction, p. 2 for a discussion of the DoD data collection system.

were furnished the companies and each company was requested to provide aggregate Profit/Sales ratios, showing:

(1) The negotiated ("going-in") ratio of profit to sales as computed by the company; and

(2) The realized (earned) ratio of profit to sales.

Data were received on 335 contracts totalling $1,887 million. Weighted Profit/Sales ratios were computed, along with range data. The ranges apply to company averages, not to individual contracts. The results are shown in Table VI-8.

F. UNALLOWABLE AND NONRECOVERABLE COSTS

In this report, the profit reported for defense business is net profit after deduction of all costs allocable to defense business. Unallowable and nonrecoverable costs are subtracted from sales revenue along with allowable costs. Consequently commercial and defense profit figures are comparable.

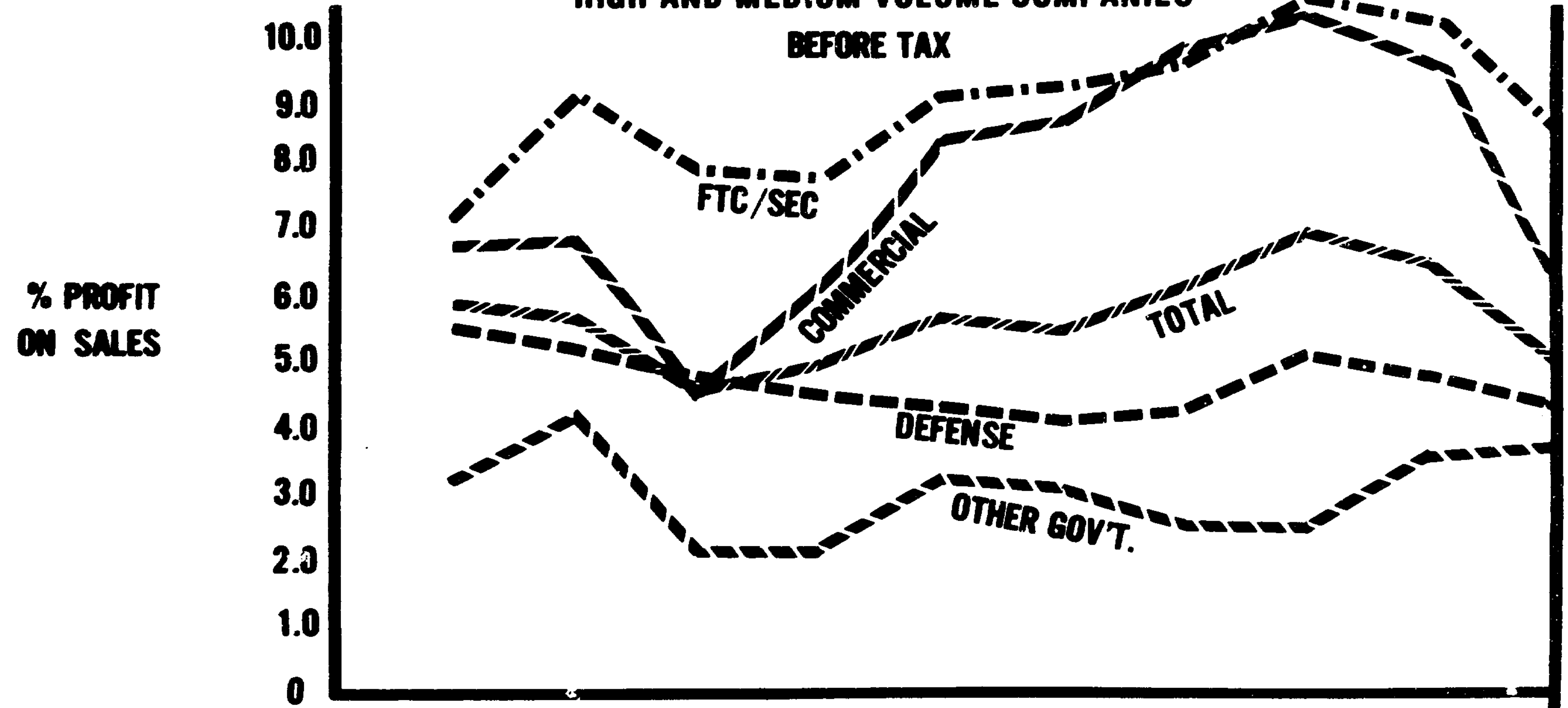
Data were collected on unallowable and nonrecoverable costs to establish the amounts of those costs relative to sales and profit, as well as to establish the effect they have on the difference between Government and contractor data on realized profit.

Of the 40 High and Medium companies, 32 reported their total unallowable and nonrecoverable costs for 1958 through 1964, and 37 reported them for 1965 through 1967. Twenty-two companies in 1965 and 1966 and 32 companies in 1967 provided a breakdown into the major categories shown in Table VI-9. The two most significant unallowable costs are interest and independent research and development (IR&D).

PROFIT ON SALES

HIGH AND MEDIUM VOLUME COMPANIES

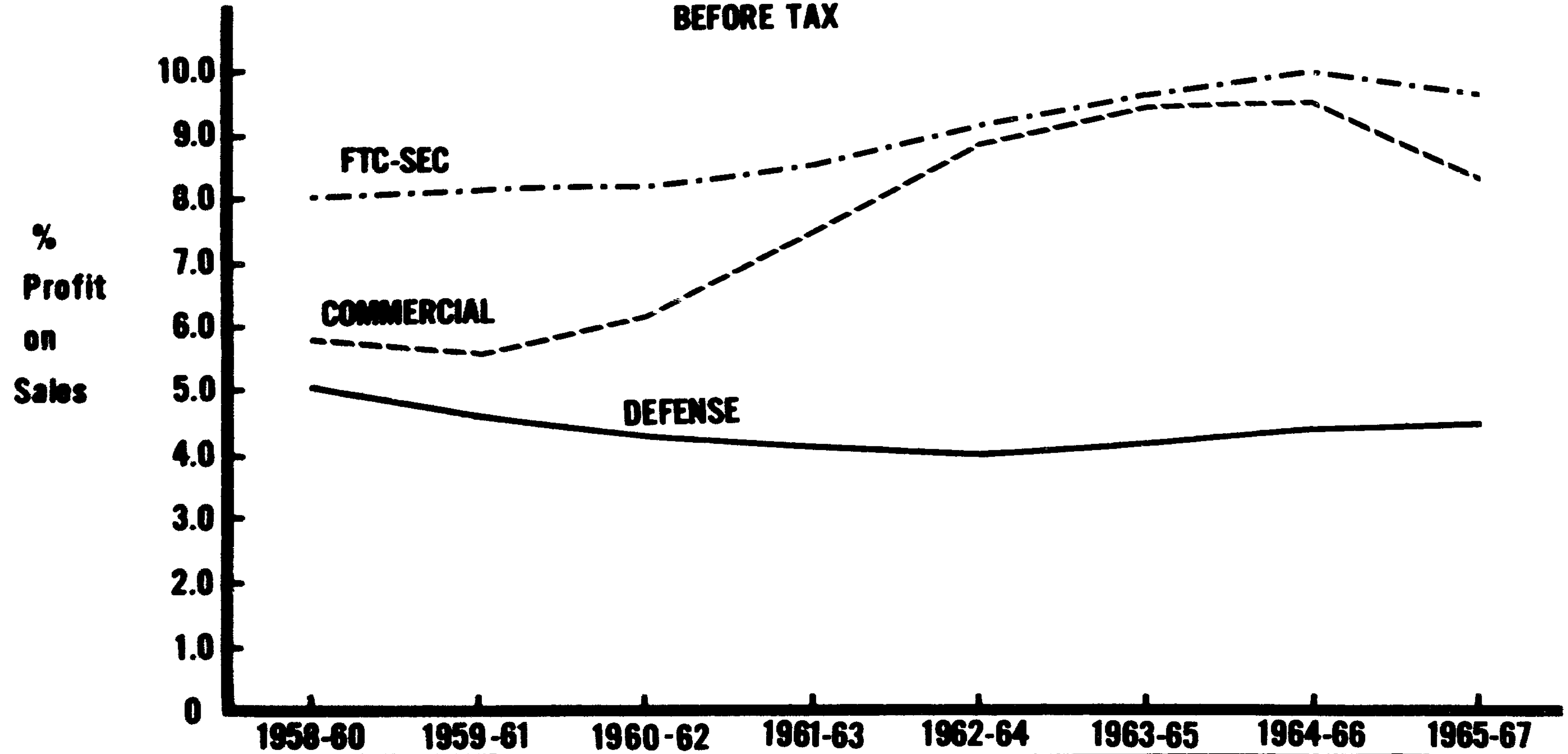
BEFORE TAX



(Sales in Millions)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
TOTAL SALES	19,124	20,791	22,042	23,045	25,080	25,705	26,446	28,000	32,339	38,792
% PROFIT TO SALES	5.8	5.6	4.4	4.8	5.6	5.4	6.0	6.8	6.4	5.2
DEFENSE SALES	12,706	13,372	13,281	14,212	15,380	14,882	13,500	12,759	14,738	17,895
% PROFIT TO SALES	5.4	5.1	4.5	4.3	4.2	3.9	4.0	4.8	4.5	4.2
OTHER GOV'T. SALES	374	448	568	718	1,249	2,320	3,239	3,906	4,064	3,266
% PROFIT TO SALES	3.1	4.1	2.0	2.0	3.1	2.9	2.4	2.4	3.4	3.7
COMMERCIAL SALES	6,044	6,971	8,193	8,116	8,452	8,504	9,707	11,334	13,537	17,631
% PROFIT TO SALES	6.6	6.7	4.3	5.9	8.2	8.4	9.6	10.1	9.2	6.4
FTC/SEC	107,579	121,387	126,982	128,897	145,064	155,038	167,032	191,539	220,062	230,418
% PROFIT TO SALES	7.1	8.9	7.8	7.7	8.9	9.1	9.5	10.4	10.0	8.7

Chart VI-1

PROFIT ON SALES
3 YEAR RUNNING AVERAGES
HIGH AND MEDIUM VOLUME COMPANIES
BEFORE TAX



Profit /Sales	1958-60	1959-61	1960-62	1961-63	1962-64	1963-65	1964-66	1965-67
Defense	5.0	4.6	4.3	4.1	4.0	4.2	4.4	4.5
Commercial	5.8	5.6	6.2	7.5	8.8	9.4	9.6	8.3
FTC-SEC	8.0	8.1	8.2	8.6	9.2	9.7	10.0	9.7

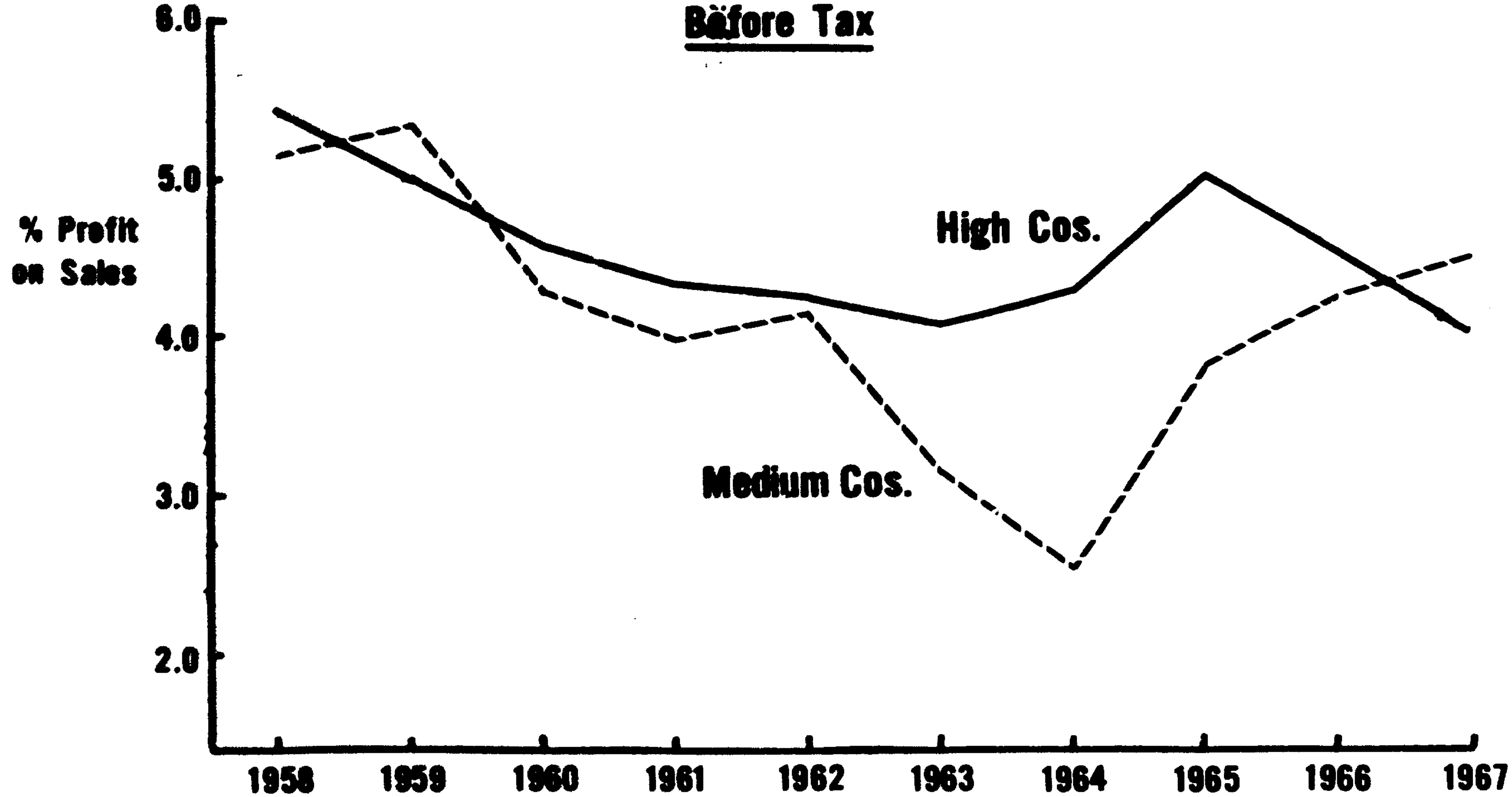
Chart V1-2

RATIO OF PROFIT TO SALES

High and Medium Volume Companies

Defense Business

Before Tax



	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
High Cos.	5.41	5.02	4.58	4.33	4.26	4.10	4.31	5.12	4.54	4.04
Med. Cos.	5.13	5.33	4.30	3.99	4.14	3.14	2.57	3.80	4.24	4.59

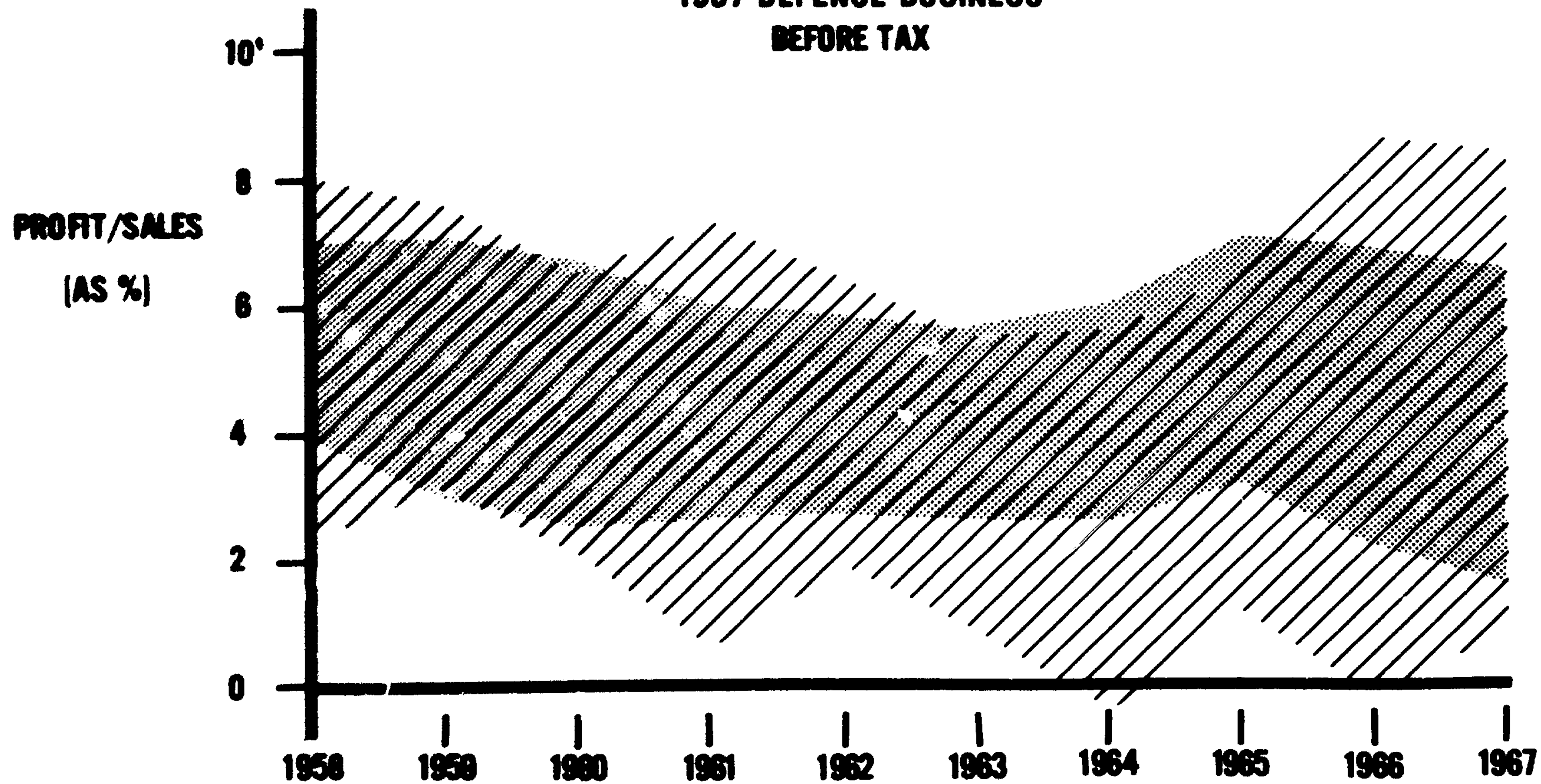
Chart VI-3

PROFIT / SALES RANGE DATA

HIGH AND MEDIUM VOLUME COMPANIES

1967 DEFENSE BUSINESS

BEFORE TAX



For any fixed amount of Sales, selected at random, there is a 68% probability that Profit/Sales will fall within the indicated range.

represents the High Volume company range.

represents the Medium Volume company range.

Chart VI -4

RATIO OF PROFIT TO SALES
PRIME CONTRACT VS. SUBCONTRACT

HIGH AND MEDIUM COMPANIES

Defense Business

BEFORE TAX

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Prime Con.	5.19	4.84	4.88	4.76	4.52	4.00	4.14	5.25	4.81	4.19
Subcon.	4.22	5.19	3.94	4.75	4.66	4.09	4.61	4.33	6.10	3.78

Chart VI- 5

SUMMARY OF PROFITS BY TYPE OF CONTRACT
HIGH AND MEDIUM VOLUME COMPANIES

BEFORE TAX (IN MILLIONS)

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
CPFF										
SALES	5,175	6,113	6,787	6,806	6,534	4,117	2,324	1,379	1,541	1,452
% PROFIT/SALES	3.9	3.8	3.7	3.6	3.5	3.3	3.7	4.7	4.6	5.0
CPIF										
SALES	524	1,100	840	1,155	1,461	2,586	2,711	2,206	2,177	2,562
% PROFIT/SALES	2.7	4.6	6.1	4.4	4.0	4.6	4.9	5.0	5.3	5.7
FPI										
SALES	3,881	3,175	2,674	2,899	3,547	4,246	4,682	4,253	4,717	6,509
% PROFIT/SALES	6.3	5.7	5.8	6.8	6.[illegible]	5.6	6.1	6.5	5.9	3.9
FFP										
SALES	2,133	2,008	2,221	2,498	2,915	3,225	3,282	4,572	5,735	5,628
% PROFIT/SALES	7.2	7.3	5.4	3.8	3.9	2.4	0.9	3.7	2.9	3.7
PRICE COMPETITIVE										
SALES	133	206	293	483	763	1,028	962	1,270	1,600	1,801
% PROFIT/SALES	11.0	4.6	3.1	2.7	3.0	(0.2)	(4.2)	1.6	0.4	0.9

Table VI-6

DISTRIBUTIONS OF THE PROFIT TO SALES RATIO BY TYPE OF CONTRACT SALES
HIGH AND MEDIUM VOLUME COMPANIES

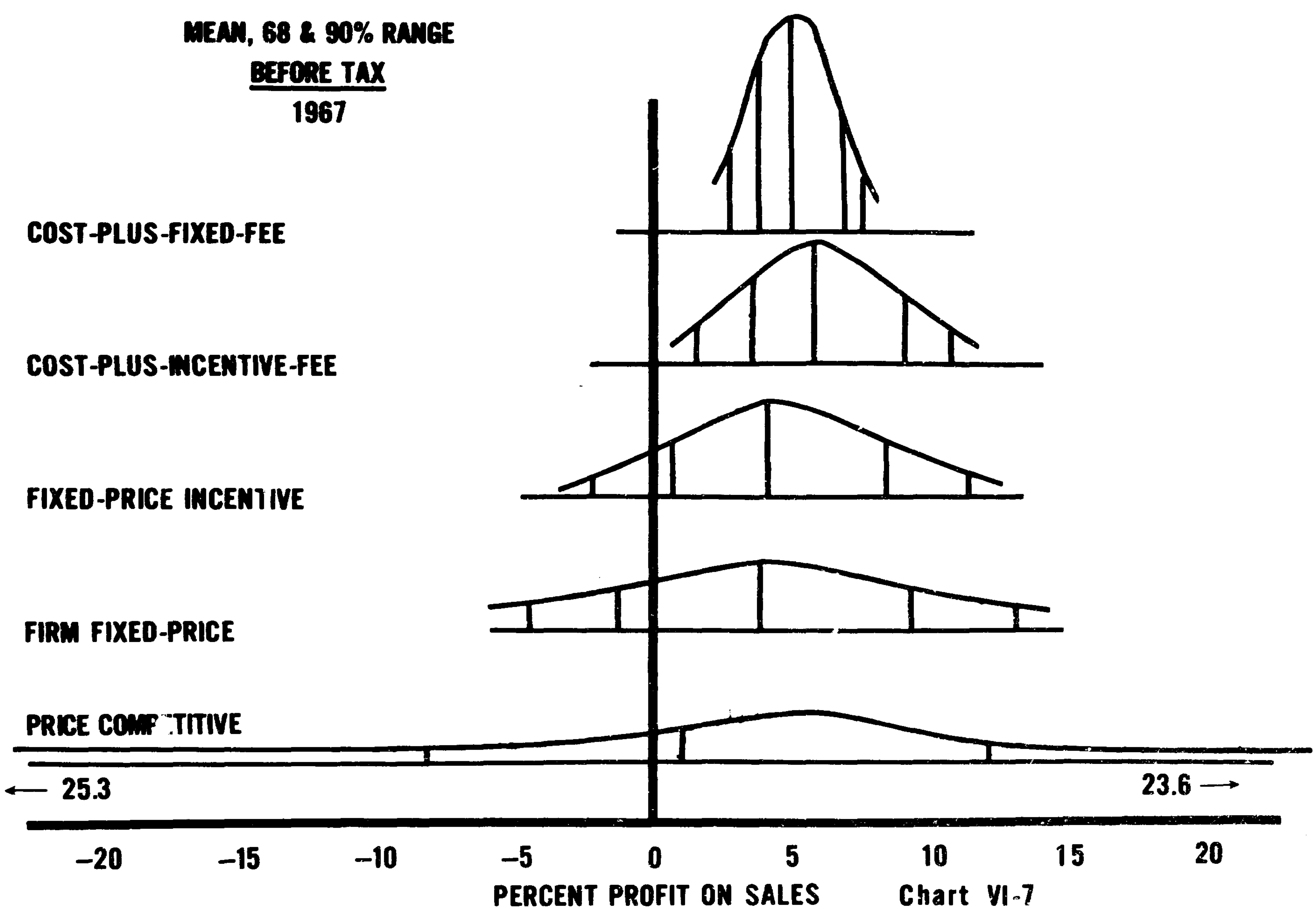


Chart VI-7

FIRM FIXED-PRICE CONTRACTS

NEGOTIATED UNDER THE WEIGHTED GUIDELINES

1964-1966

	NUMBER OF CONTRACTS	$ MILLIONS CONTRACT AMOUNT
TOTAL SAMPLE*	419	2,109
TOTAL REPORTED	335	1,887

	PERCENT PROFIT/SALES		
	AVERAGE (MEAN)	5TH PERCENTILE	95TH PERCENTILE
AS NEGOTIATED - PER DOD	10.4%	9.0%	12.0%
AS NEGOTIATED - PER COMPANIES	10.3%	8.7%	11.8%
REALIZED PROFIT - PER COMPANIES	9.7%	(0.2)%	14.6%

* TOTAL POPULATION: 1,117 CONTRACTS
: $6,821 MILLION

Table VI-8

UNALLOWABLE/NONRECOVERABLE COST RATIOS

DEFENSE RATIOS	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
PROFIT/SALES	5.4	5.1	4.5	4.3	4.2	3.9	4.0	4.8	4.5	4.2
UNALL./SALES	1.5	1.4	1.4	1.4	1.5	1.5	1.6	1.8	1.7	1.6
UNALL./SALES:										
10th Percentile	0.14	0.48	0.43	0.42	0.46	0.26	0.35	0.49	0.82	0.49
Median	1.14	1.07	1.17	1.25	1.38	1.61	1.56	1.64	1.58	1.46
90th Percentile	4.93	3.23	3.28	2.72	3.05	3.44	3.67	3.75	3.07	2.67

MAJOR CATEGORIES OF UNALLOWABLE/NONRECOVERABLE COSTS	1965 & 1966	1967
INTEREST	23.0%	29.6 %
RESEARCH & DEVELOPMENT	40.5%	27.4 %
CONTRIBUTIONS & DONATIONS	2.5%	43.0 %
OTHER (Advertising, unusual amortization, etc.)	34.0%	

Table VI-9

SECTION VII

PROFIT RATIOS, CONFIDENCE INTERVALS,
AND RANGE DATA

A. GENERAL

The tables and charts of this section depict the profit experience of defense contractors. Profit is shown as a percent of sales, percent of equity capital investment (ECI), and total capital investment (TCI). Total capital investment is defined to include ECI and long-term debt. All data shown are pre-tax.

Profit ratios are presented as weighted averages. Sixty-eight percent and 90% confidence intervals for the averages are also given, as are 68% and 90% probability ranges for company profit.

Profit data are broken down into high, medium, and low volume categories, based on company defense sales volume. Defense sales include both prime and subcontract sales. Data are presented for the combined high and medium volume company populations and for the combined high, medium and low populations.

B. STATISTICAL APPROACH

The approach to statistical analysis of the sample data was, in general, 1) to compute profit rate averages for sample defense and commercial business in the three population categories, 2) to assess the degree to which those averages can be regarded as valid for the three population categories (confidence interval), and 3) to examine the variation in profit rates within the population categories (range data). In addition to analysis of the individual population categories, study was made of the profitability of the population as a whole, and of the high and medium volume categories combined.

1. Averages

The ratios of profit/sales, profit/ECI, and profit/TCI used throughout this report are weighted average ratios. In these averages the individual company ratios are weighted in direct proportion to each company's sales, ECI and TCI, respectively. The average ratios are calculated by adding profits for all sample companies in the same population category and dividing that total by the sum of sales, ECI or TCI for those companies.

2. Probability Distributions

The high, medium and low volume profit rates, observed separately, appear to be normally distributed. That conclusion was reached by inspection after drawing frequency distributions for the profit rates and fitting normal distribution curves to them.

Profit rate probability distributions for combinations of population categories, however, are not normal. For such combinations, distributions were derived from the normal distributions of the individual categories. The derived distributions are complex to work with statistically, but are necessary to maintain the validity of the analysis of confidence limits and ranges.

3. Confidence Intervals

To assess the degree to which sample averages can be regarded as valid for the entire population categories (or combination thereof), 68% and 90% confidence intervals were calculated for the averages. As noted in Section III, confidence intervals for the averages tell us to what degree we can believe the <u>sample</u> average to be a measure of the <u>true</u> average.

4. <u>Ranges</u>

In the confidence interval calculation we have shown the likelihood that the sample average represents the total population average. Now we would like to ask a related question, "Given a company whose sales volume is in this population; what will its profits be?" This question is answered, within limits, by the range statistics.

From the probability distributions, 68% and 90% ranges were calculated. For the calculations weighted by dollars, they answer the question, "For any fixed number of dollars of sales (or ECI or TCI, according to the ratio being considered), selected at random, by how much might the percent profit differ from the weighted average of the population category?" If a 68% range about a weighted average extends from x to y, we can say, "There is 68% probability that a fixed amount of sales (or ECI or TCI) dollars selected at random will yield between x and y percent profit."

C. <u>ESTIMATING POPULATION SIZE</u>

In order to carry out the statistical tests of validity (assign confidence limits and ranges) described in B, above, it is necessary to estimate the sizes of the population categories, both defense and commercial. Size estimates must be in the terms of numbers of companies, sales volume, ECI, and TCI. Another use of the population data is in the assembly of the combined averages for high, medium, plus low volume and high plus medium volume categories.

By contrast, the averages data contained in this report do not depend on knowledge of the population parameters.

Because of the difficulty in matching company data with DoD data, several assumptions had to be made in estimating population sizes. These included:

- Relationships between defense awards and defense sales for the population.
- Relationships between both commercial and defense investments and sales in the population versus the sample.
- Relationships between commercial sales and investment and defense sales and investment.
- Stability of these relationships with time.

The assumptions and associated calculations are given in detail in Section VIII.

D. DISPLAY OF THE DATA

Weighted averages, confidence intervals, and range data are presented in the following tables. Since they require a large number of tables and charts, the next two paragraphs are a table of contents for the data. The charts in F and G are visual displays of the data presented in the tables which they follow. The pertinent table is referenced on each chart.

E. WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

Profit/Sales	Total Population	Table VII-1 Charts VII-2 & 3
Profit/Sales	High & Medium Volume Categories	Table VII-4 Charts VII-5 & 6
Profit/Sales	High Volume Category	Table VII-7 Charts VII-8 & 9
Profit/Sales	Medium Volume Category	Table VII-10 Charts VII-11 & 12
Profit/Sales	Low Volume Category	Table VII-13 Charts VII-14 & 15

Profit/ECI	Total Population	Table VII-16
Profit/ECI	High & Medium Volume Categories	Table VII-17
Profit/ECI	High Volume Category	Table VII-18
Profit/ECI	Medium Volume Category	Table VII-19
Profit/ECI	Low Volume Category	Table VII-20
Profit/TCI	Total Population	Table VII-21
Profit/TCI	High & Medium Volume Categories	Table VII-22
Profit/TCI	High Volume Category	Table VII-23
Profit/TCI	Medium Volume Category	Table VII-24
Profit/TCI	Low Volume Category	Table VII-25

F. WEIGHTED AVERAGES AND RANGE DATA

Profit/Sales	Total Population	Table VII-26
Profit/Sales	High & Medium Volume Categories	Table VII-27 Chart VII-28
Profit/Sales	High Volume Category	Table VII-29
Profit/Sales	Medium Volume Category	Table VII-30
Profit/Sales	Low Volume Category	Table VII-31
Profit/ECI	Total Population	Table VII-32
Profit/ECI	High & Medium Volume Categories	Table VII-33
Profit/ECI	High Volume Category	Table VII-34
Profit/ECI	Medium Volume Category	Table VII-35
Profit/ECI	Low Volume Category	Table VII-36
Profit/TCI	Total Population	Table VII-37
Profit/TCI	High & Medium Volume Categories	Table VII-38 Chart VII-39
Profit/TCI	High Volume Category	Table VII-40
Profit/TCI	Medium Volume Category	Table VII-41
Profit/TCI	Low Volume Category	Table VII-42

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
PROFIT/SALES

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	5.09	4.71 - 5.47	4.47 - 5.71	6.32	4.89 - 7.75	3.97 - 8.67
1959	5.33	4.88 - 5.78	4.59 - 6.07	8.15	7.12 - 9.18	6.46 - 9.84
1960	4.90	4.17 - 5.63	3.70 - 6.10	6.60	5.44 - 7.76	4.69 - 8.51
1961	4.16	3.73 - 4.59	3.46 - 4.86	7.43	6.44 - 8.42	5.80 - 9.06
1962	3.47	2.74 - 4.20	2.27 - 4.67	8.59	7.59 - 9.59	6.95 - 10.23
1963	2.77	2.34 - 3.20	2.06 - 3.48	8.41	7.46 - 9.36	6.84 - 9.98
1964	2.46	1.54 - 3.38	0.94 - 3.98	8.60	7.82 - 9.38	7.31 - 9.89
1965	3.92	3.38 - 4.46	3.04 - 4.80	9.44	8.61 - 10.27	8.07 - 10.81
1966	4.08	3.60 - 4.56	3.28 - 4.88	9.12	8.25 - 9.99	7.69 - 10.55
1967	5.14	4.56 - 5.72	4.19 - 6.10	7.26	6.42 - 8.10	5.88 - 8.64

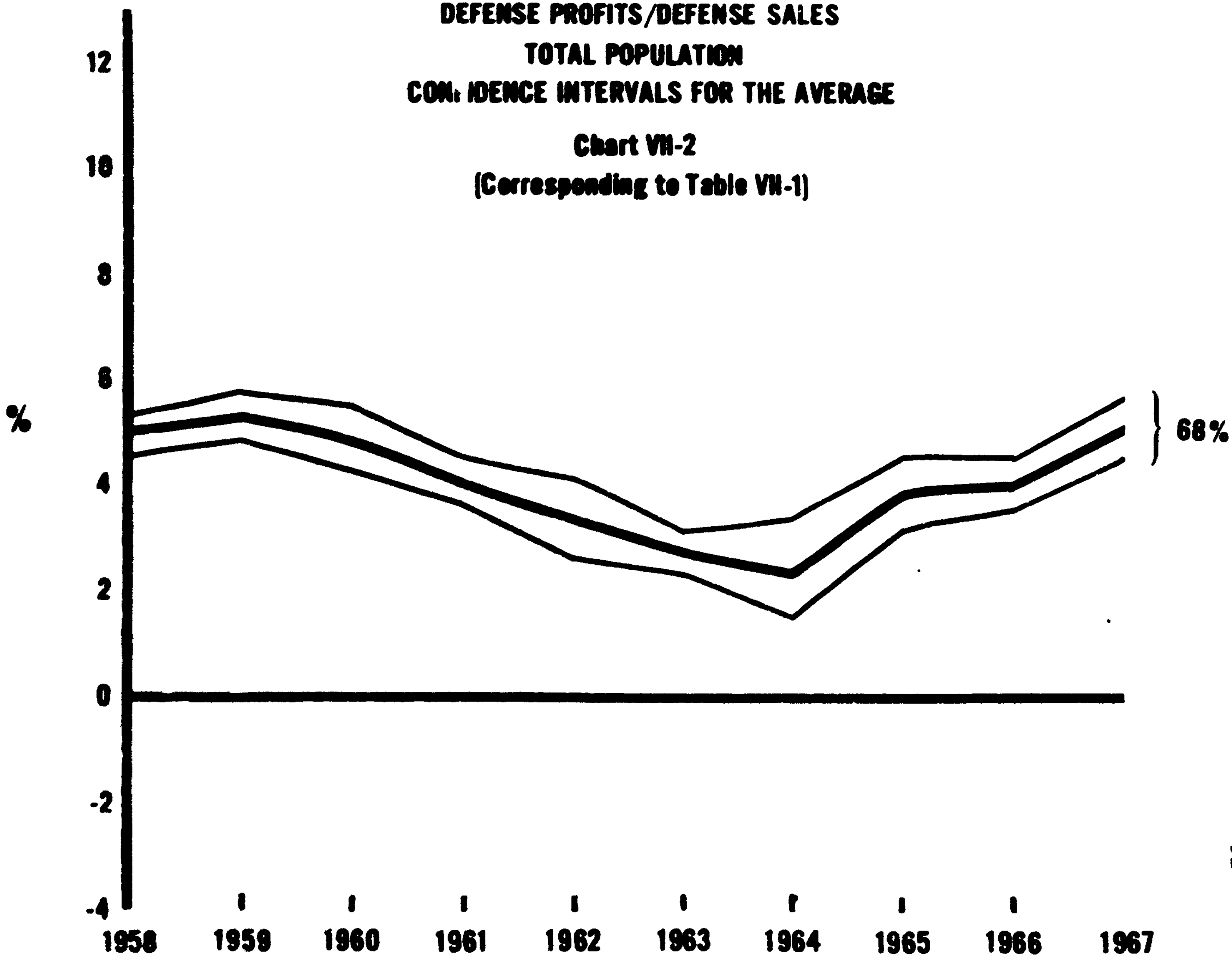
[1]Averages weighted by companies' defense sales volume.

[2]Averages weighted by companies' commercial sales volume.

Table VII-1

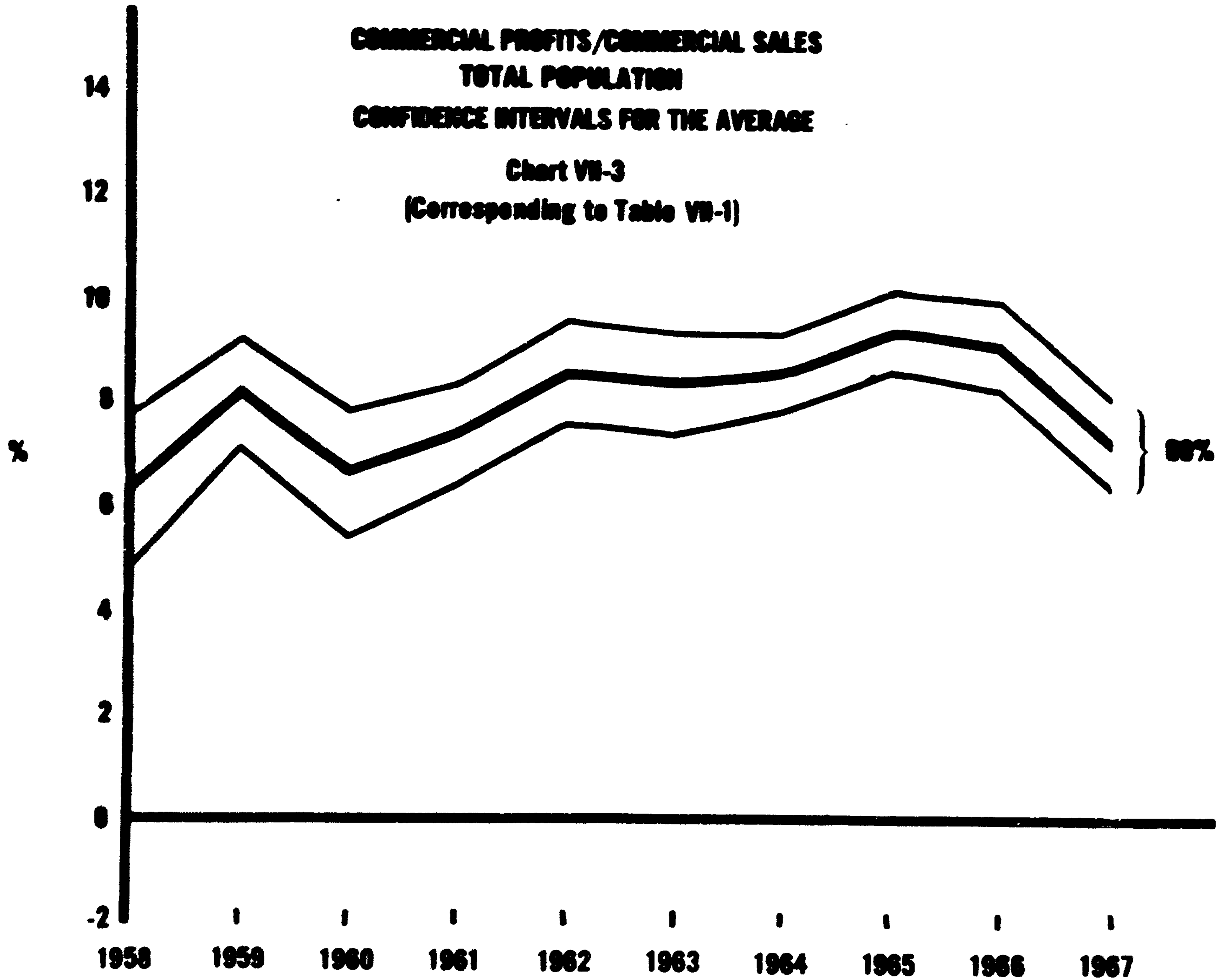
DEFENSE PROFITS/DEFENSE SALES
TOTAL POPULATION
CON: IDENCE INTERVALS FOR THE AVERAGE

Chart VII-2
(Corresponding to Table VII-1)



COMMERCIAL PROFITS/COMMERCIAL SALES
TOTAL POPULATION
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-3
(Corresponding to Table VII-1)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
PROFIT/SALES

High and Medium Volume Categories

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	5.37	5.11 - 5.63	4.95 - 5.79	6.63	5.02 - 8.24	3.97 - 9.29
1959	5.07	4.80 - 5.34	4.63 - 5.51	6.67	5.77 - 7.57	5.18 - 8.16
1960	4.53	4.29 - 4.77	4.13 - 4.93	4.29	3.28 - 5.30	2.63 - 5.95
1961	4.26	3.99 - 4.53	3.82 - 4.70	5.88	4.93 - 6.83	4.31 - 7.45
1962	4.24	4.00 - 4.48	3.85 - 4.63	8.15	7.29 - 9.01	6.73 - 9.57
1963	3.92	3.72 - 4.12	3.59 - 4.25	8.43	7.73 - 9.13	7.28 - 9.58
1964	3.97	3.76 - 4.18	3.62 - 4.32	9.61	8.82 - 10.40	8.31 - 10.91
1965	4.84	4.59 - 5.09	4.43 - 5.25	10.11	9.36 - 10.86	8.88 - 11.34
1966	4.47	4.14 - 4.80	3.93 - 5.01	9.16	8.37 - 9.95	7.87 - 10.45
1967	4.17	3.84 - 4.49	3.63 - 4.71	6.38	5.73 - 7.04	5.31 - 7.46

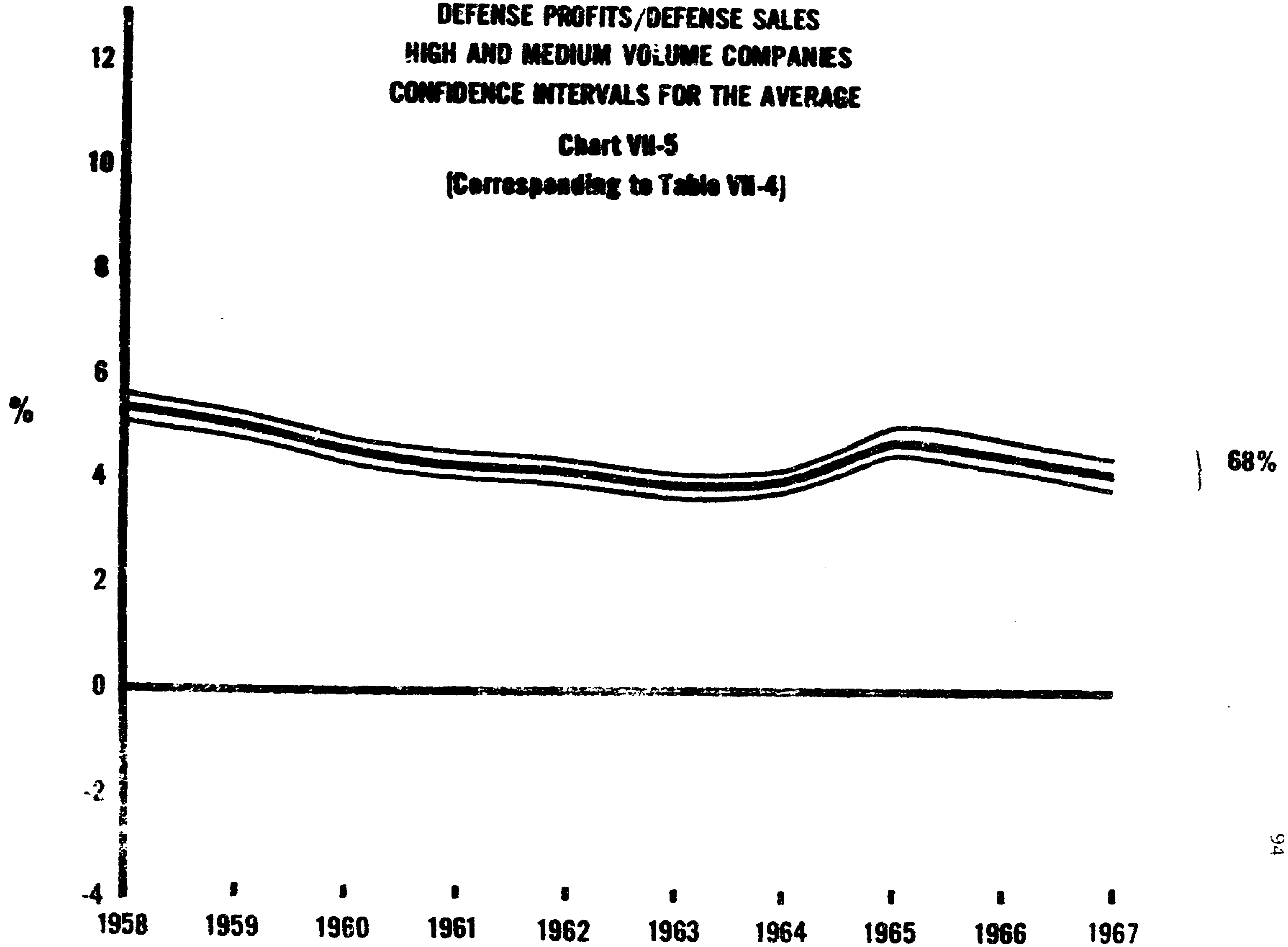
[1] Averages weighted by companies' defense sales volume.

[2] Averages weighted by companies' commercial sales volume.

Table VII-4

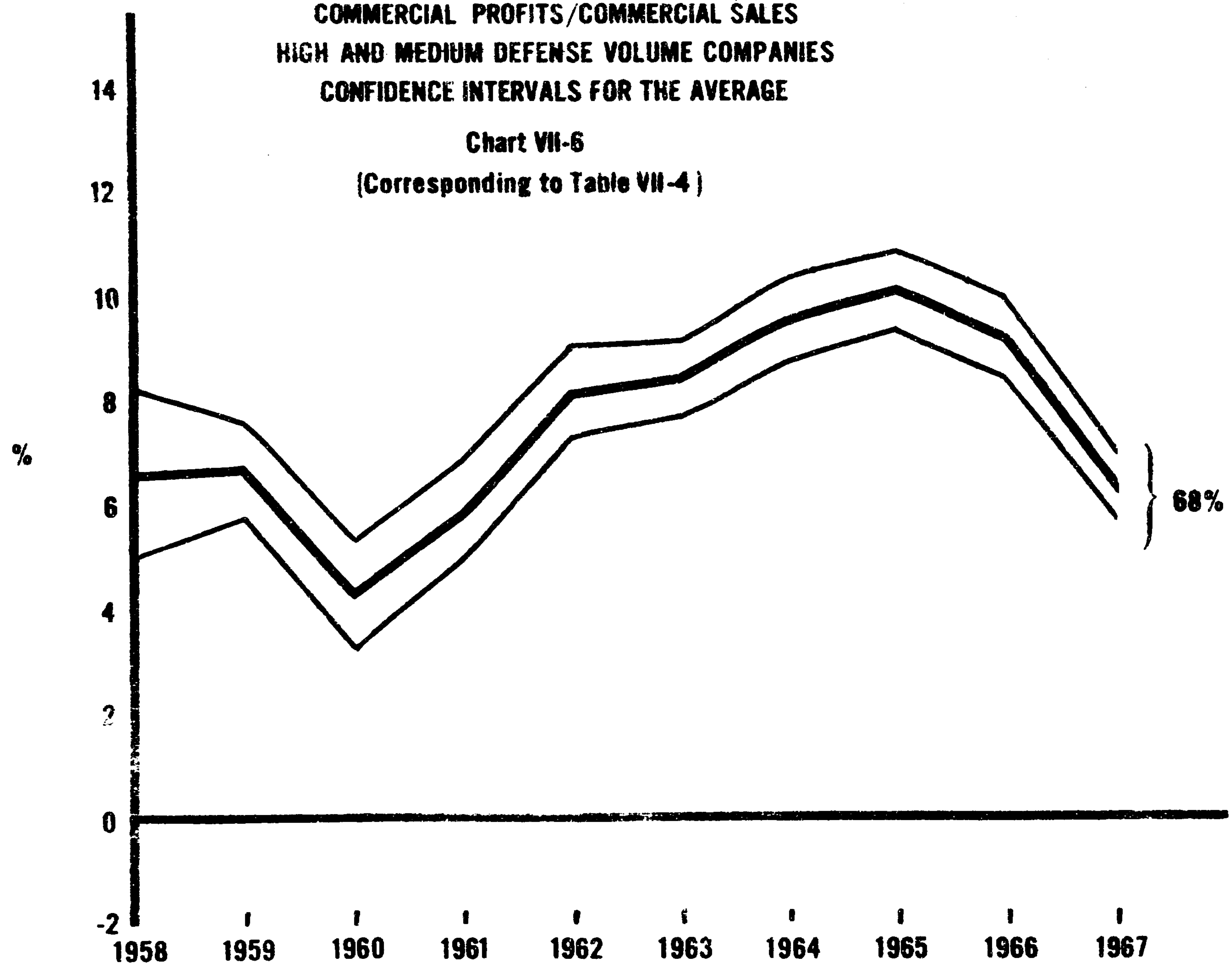
DEFENSE PROFITS/DEFENSE SALES
HIGH AND MEDIUM VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-5
(Corresponding to Table VII-4)



COMMERCIAL PROFITS/COMMERCIAL SALES
HIGH AND MEDIUM DEFENSE VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-6
(Corresponding to Table VII-4)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

High Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	5.41	5.32 - 5.50	5.26 - 5.56	7.26	6.36 - 8.16	5.77 - 8.75
1959	5.02	4.90 - 5.14	4.82 - 5.22	5.01	4.06 - 5.96	3.44 - 6.58
1960	4.58	4.46 - 4.70	4.38 - 4.78	1.93	0.93 - 2.93	0.29 - 3.57
1961	4.33	4.23 - 4.43	4.17 - 4.49	3.69	2.69 - 4.69	2.05 - 5.33
1962	4.26	4.17 - 4.35	4.11 - 4.41	7.68	7.42 - 7.94	7.26 - 8.10
1963	4.10	4.01 - 4.19	3.95 - 4.25	8.34	8.09 - 8.59	7.93 - 8.75
1964	4.31	4.21 - 4.41	4.15 - 4.47	9.80	9.62 - 9.98	9.51 - 10.09
1965	5.12	5.01 - 5.23	4.94 - 5.30	10.00	9.84 - 10.16	9.73 - 10.27
1966	4.54	4.41 - 4.67	4.32 - 4.76	8.19	7.78 - 8.60	7.51 - 8.87
1967	4.04	3.89 - 4.19	3.80 - 4.29	5.81	5.37 - 6.25	5.08 - 6.53

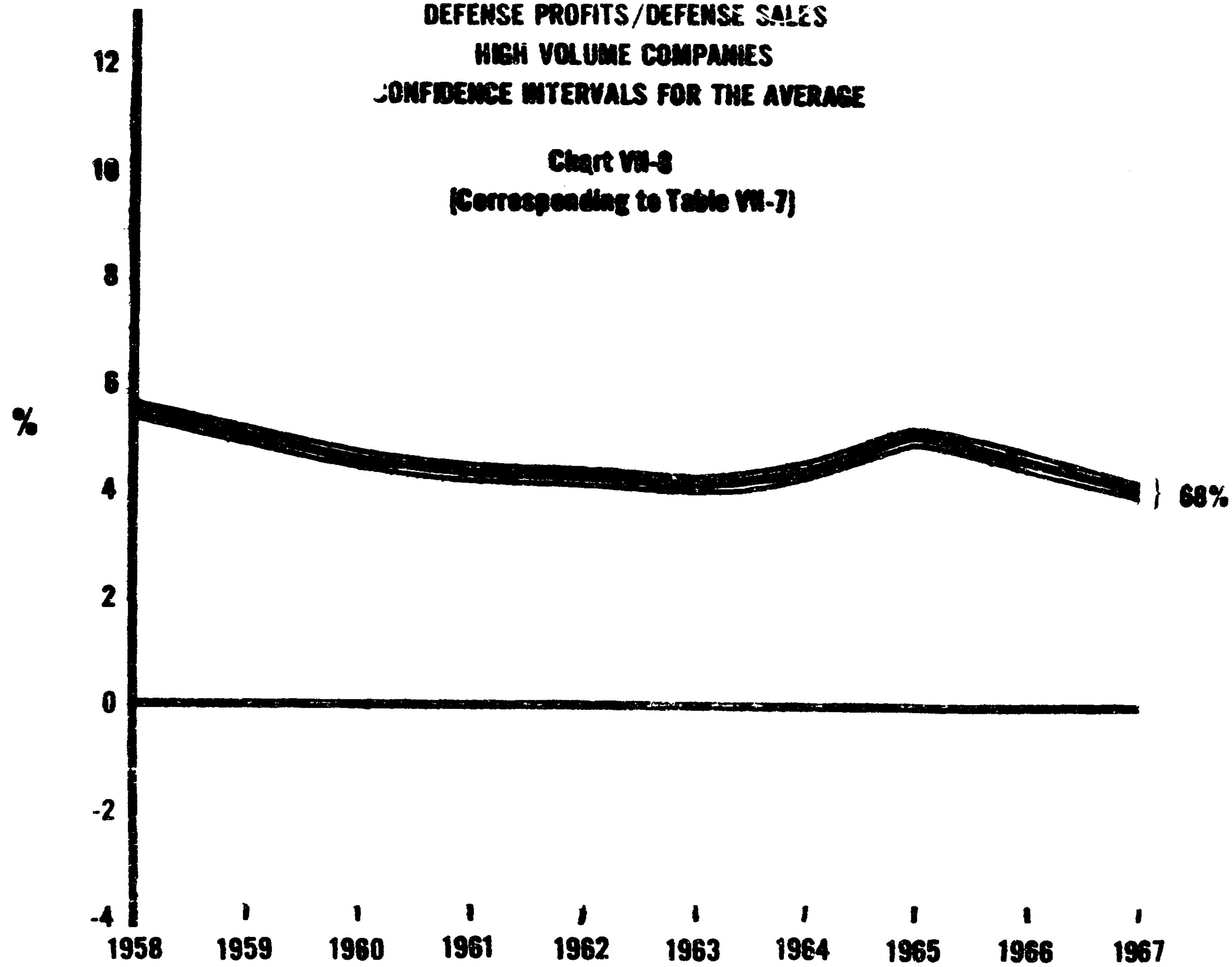
[1] Averages weighted by companies' defense sales volume.

[2] Averages weighted by companies' commercial sales volume.

Table VII-7

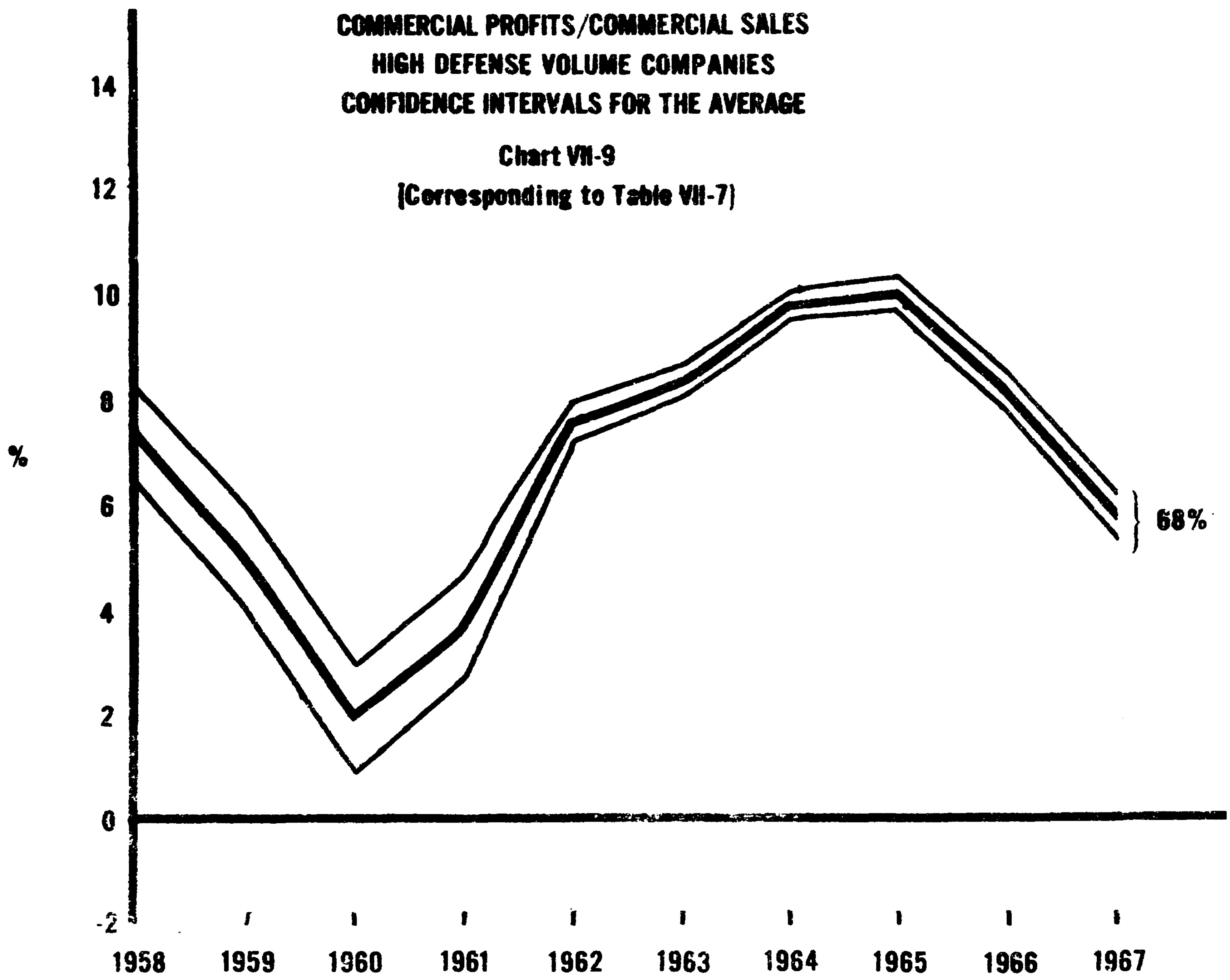
DEFENSE PROFITS/DEFENSE SALES
HIGH VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-8
(Corresponding to Table VII-7)



COMMERCIAL PROFITS/COMMERCIAL SALES
HIGH DEFENSE VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-9
(Corresponding to Table VII-7)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
PROFIT/SALES

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	5.13	4.64 - 5.62	4.33 - 5.93	5.44	1.42 - 9.46	(1.17) - 12.05
1959	5.33	4.95 - 5.71	4.70 - 5.96	9.68	8.53 - 10.83	7.79 - 11.57
1960	4.30	3.92 - 4.68	3.68 - 4.92	9.47	7.77 - 11.17	6.67 - 12.27
1961	3.99	3.42 - 4.56	3.05 - 4.93	10.52	9.27 - 11.77	8.47 - 12.57
1962	4.14	3.74 - 4.54	3.49 - 4.79	9.15	7.28 - 11.02	6.07 - 12.23
1963	3.14	2.73 - 3.55	2.47 - 3.81	8.59	7.34 - 9.84	6.53 - 10.65
1964	2.57	2.05 - 3.09	1.72 - 3.42	9.27	7.79 - 10.75	6.84 - 11.70
1965	3.80	3.34 - 4.26	3.04 - 4.56	10.30	9.15 - 11.45	8.40 - 12.20
1966	4.24	3.48 - 5.00	2.99 - 5.49	10.87	9.78 - 11.96	9.08 - 12.66
1967	4.59	3.94 - 5.25	3.51 - 5.67	7.52	6.40 - 8.63	5.68 - 9.35

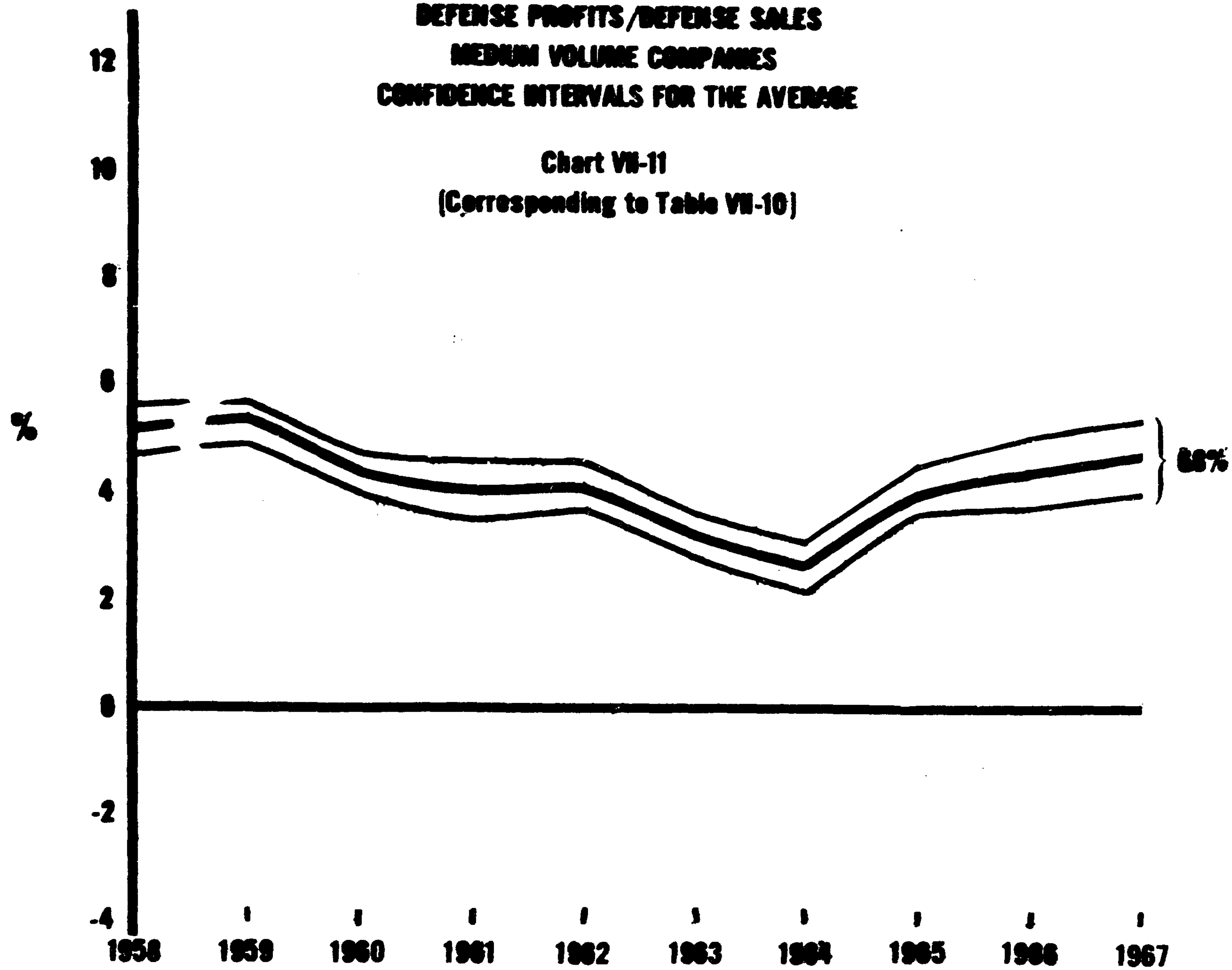
[1] Averages weighted by companies' defense sales volume.

[2] Averages weighted by companies' commercial sales volume.

Table VII-10

DEFENSE PROFITS/DEFENSE SALES
MEDIUM VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-11
(Corresponding to Table VII-10)



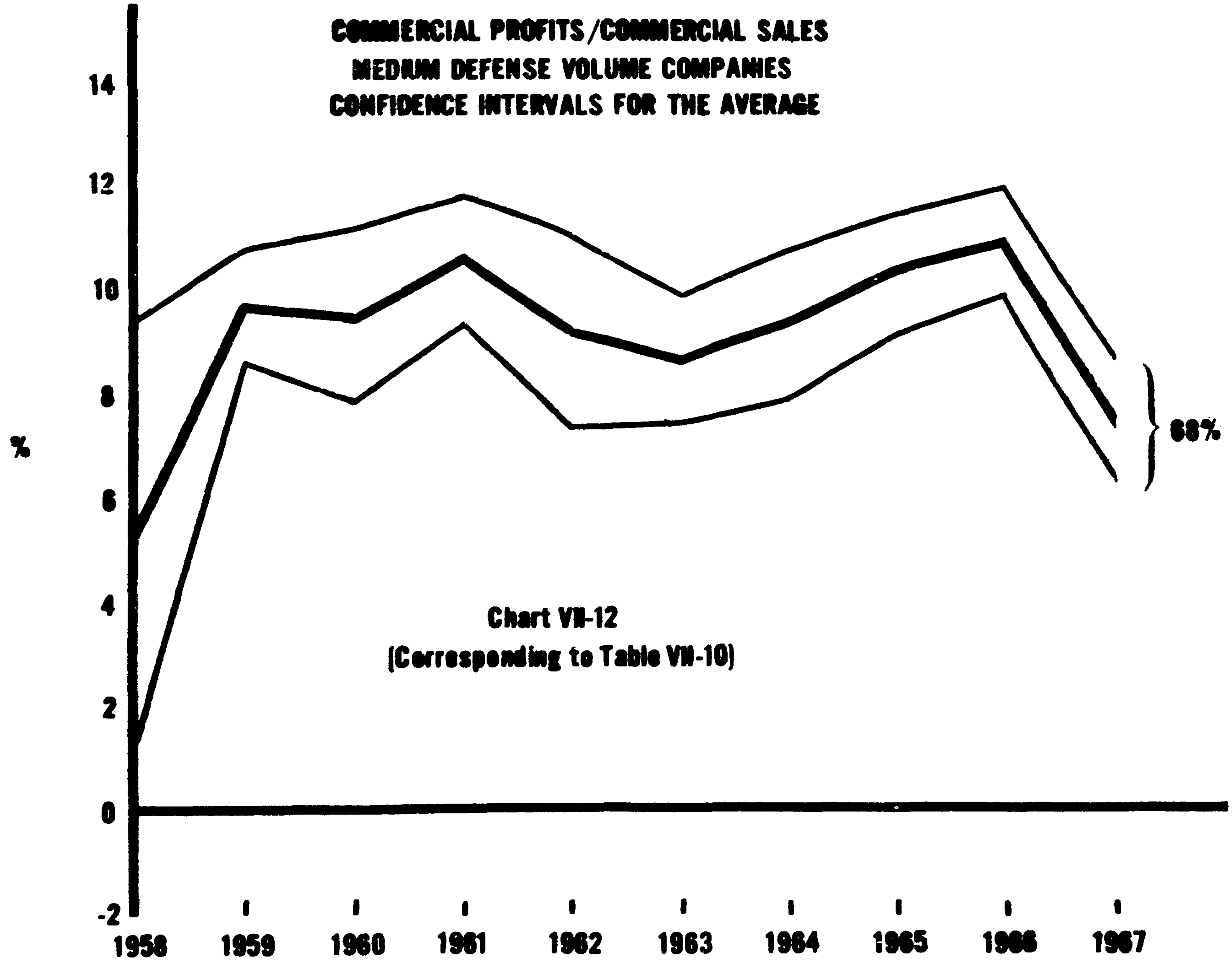


Chart VII-12
(Corresponding to Table VII-10)

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	3.90	2.85 - 4.95	2.18 - 5.62	5.11	2.18 - 8.04	0.29 - 9.93
1959	6.18	5.41 - 6.95	4.92 - 7.44	11.92	10.75 - 13.09	9.99 - 13.85
1960	6.08	3.79 - 8.37	2.32 - 9.84	12.47	10.63 - 14.31	9.44 - 15.50
1961	3.88	2.85 - 4.91	2.19 - 5.57	9.74	8.43 - 11.05	7.59 - 11.89
1962	1.69	(0.40) - 3.78	(1.75) - 5.13	9.09	7.54 - 10.64	6.55 - 11.63
1963	0.45	(0.71) - 1.61	(1.46) - 2.36	8.39	6.74 - 10.04	5.68 - 11.10
1964	(0.45)	(2.99) - 2.09	(4.63) - 3.73	7.39	6.42 - 8.36	5.80 - 8.98
1965	2.01	0.58 - 3.44	(0.35) - 4.37	8.64	7.60 - 9.68	6.93 - 10.35
1966	3.32	2.24 - 4.40	1.54 - 5.10	9.07	8.00 - 10.14	7.31 - 10.83
1967	7.03	6.08 - 7.97	5.47 - 8.58	8.44	7.16 - 9.72	6.33 - 10.55

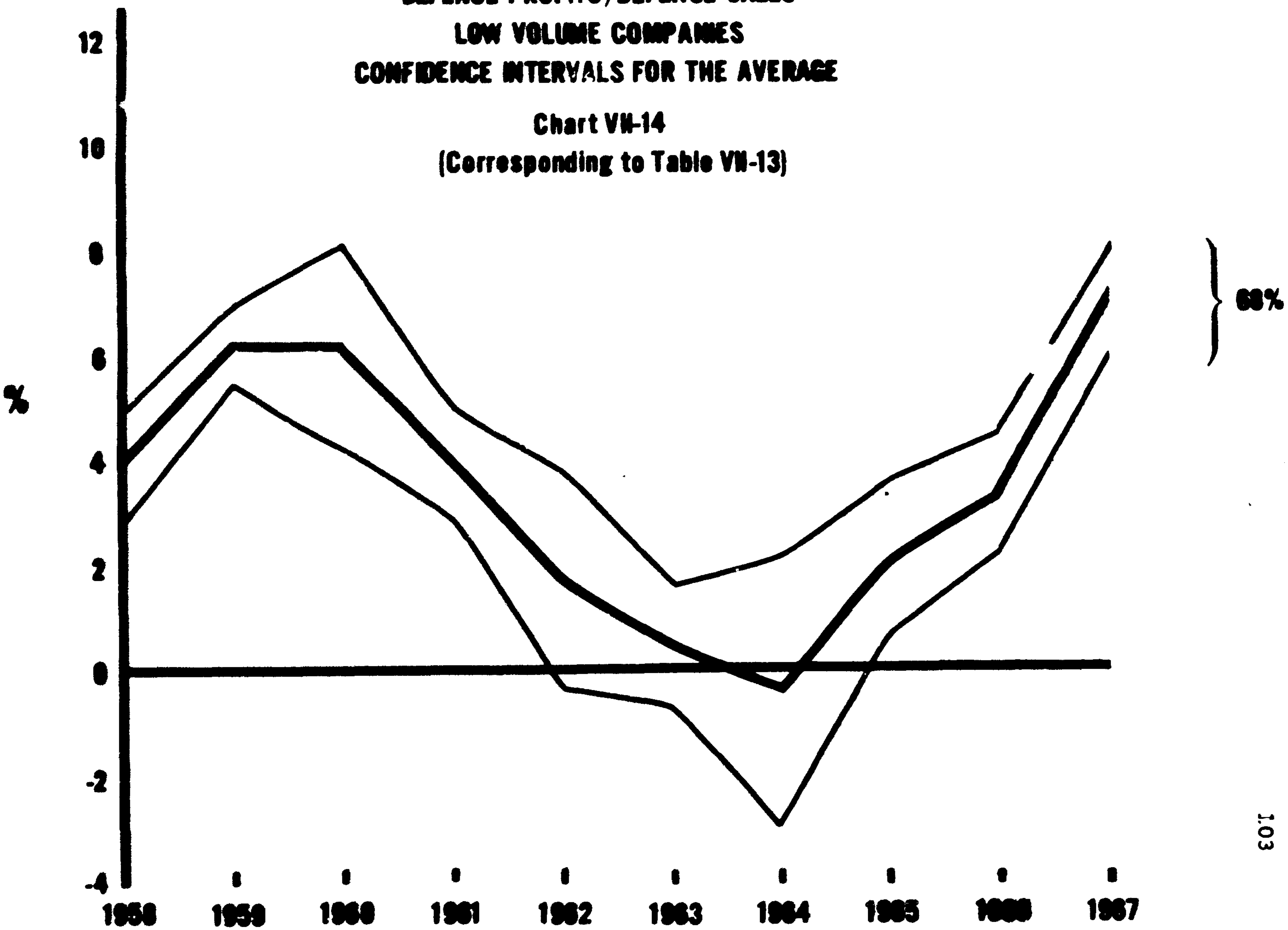
[1]Averages weighted by companies' defense sales volume.

[2]Averages weighted by companies' commercial sales volume.

Table VII-13

DEFENSE PROFITS/DEFENSE SALES
LOW VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE

Chart VII-14
(Corresponding to Table VII-13)



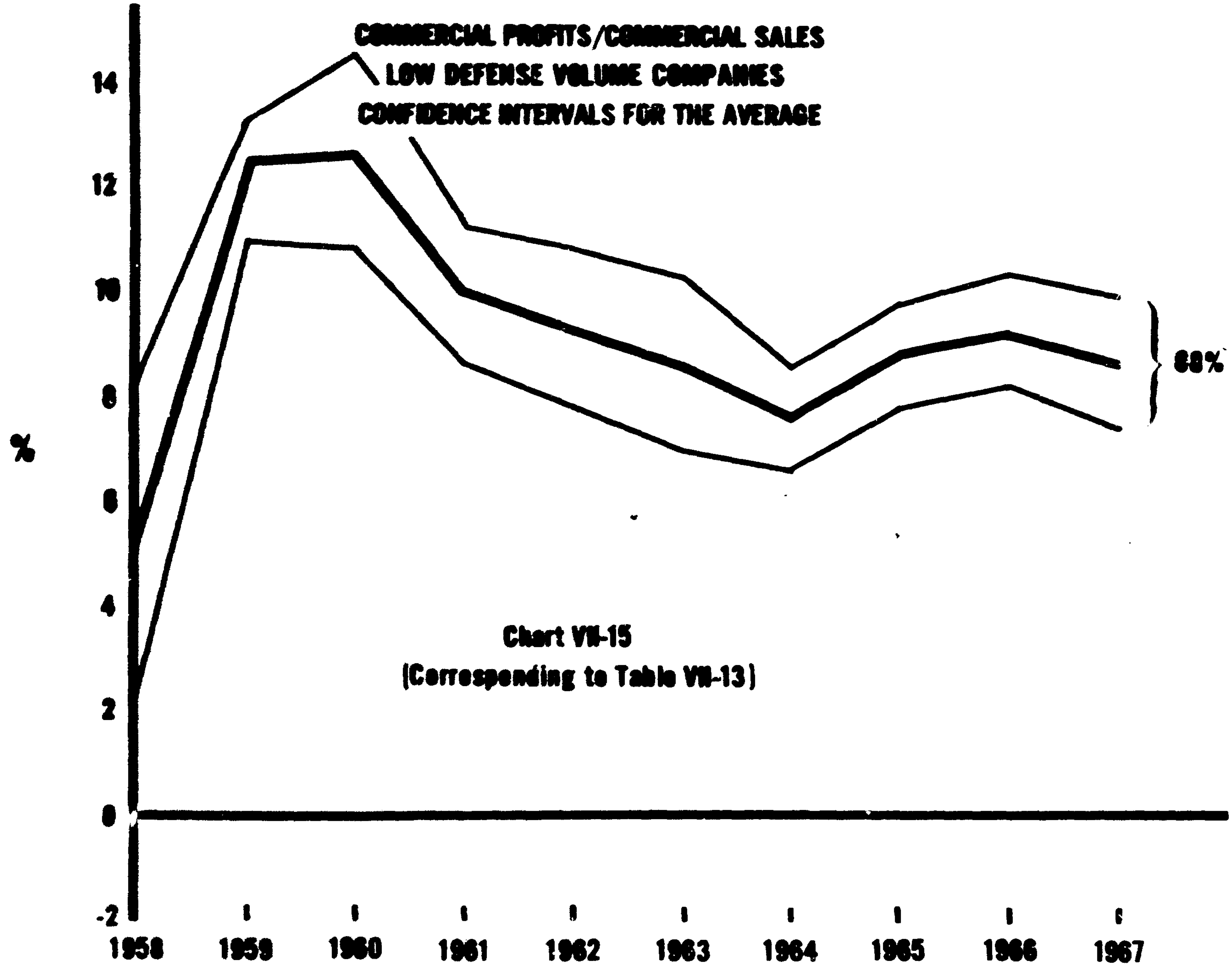


Chart VII-15
(Corresponding to Table VII-13)

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	21.59	19.96 - 23.22	18.90 - 24.28	17.00	11.64 - 22.36	8.18 - 25.82
1959	21.49	19.83 - 23.15	18.76 - 24.22	21.30	18.34 - 24.26	16.43 - 26.17
1960	19.48	17.03 - 21.93	15.44 - 23.52	17.65	14.08 - 21.22	11.78 - 23.52
1961	14.75	13.45 - 16.05	12.61 - 16.89	19.04	15.49 - 22.59	13.21 - 24.87
1962	12.42	10.16 - 14.68	8.70 - 16.14	24.08	21.24 - 26.92	19.40 - 28.76
1963	9.92	8.44 - 11.40	7.48 - 12.36	22.05	19.61 - 24.49	18.04 - 26.06
1964	8.69	3.48 - 13.90	0.12 - 17.26	22.85	20.45 - 25.25	18.90 - 26.80
1965	13.14	9.46 - 16.82	7.09 - 19.19	25.44	23.14 - 27.74	21.65 - 29.23
1966	14.78	12.95 - 16.61	11.77 - 17.79	27.18	24.54 - 29.82	22.84 - 31.52
1967	20.37	18.34 - 22.40	17.03 - 23.71	21.51	18.96 - 24.06	17.31 - 25.70

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

Table VII-16

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
PROFIT/ECI

High and Medium Volume Categories

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	25.01	23.69 - 26.33	22.83 - 27.19	17.31	10.99 - 23.63	6.92 - 27.70
1959	23.66	22.36 - 24.96	21.53 - 25.79	17.71	15.05 - 20.37	13.33 - 22.09
1960	21.06	19.95 - 22.17	19.24 - 22.88	11.76	8.22 - 15.30	5.94 - 17.58
1961	18.46	17.29 - 19.63	16.54 - 20.38	[illegible].84	11.82 - 21.86	8.58 - 25.10
1962	18.33	17.26 - 19.40	16.58 - 20.08	2[illegible].53	20.85 - 26.21	19.12 - 27.94
1963	16.14	15.31 - 16.97	14.78 - 17.50	23.07	20.99 - 25.15	19.65 - 26.49
1964	15.56	14.72 - 16.40	14.18 - 16.94	27.35	24.85 - 29.85	23.23 - 31.47
1965	18.21	17.13 - 19.29	16.43 - 19.99	28.71	26.46 - 30.96	25.01 - 32.41
1966	17.44	16.14 - 18.74	15.30 - 19.58	27.49	24.88 - 30.10	23.20 - 31.78
1967	18.90	17.48 - 20.31	16.57 - 21.23	19.52	17.41 - 21.62	16.05 - 22.98

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

Table VII-17

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

High Volume Category

DEFENSE | COMMERCIAL

Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
	DEFENSE			**COMMERCIAL**		
1958	26.52	25.71 - 27.33	25.19 - 27.85	18.02	15.01 - 21.03	13.07 - 22.97
1959	24.50	23.70 - 25.30	23.18 - 25.82	12.60	9.62 - 15.58	7.70 - 17.50
1960	23.07	22.24 - 23.90	21.70 - 24.44	5.18	1.04 - 9.32	(1.62) - 11.98
1961	20.92	20.04 - 21.80	19.48 - 22.36	10.16	3.08 - 17.24	(1.49) - 21.81
1962	20.54	19.87 - 21.21	19.43 - 21.65	21.61	20.63 - 22.59	20.00 - 23.22
1963	18.83	18.26 - 19.40	17.89 - 19.77	22.50	21.36 - 23.64	20.62 - 24.38
1964	18.40	17.74 - 19.06	17.31 - 19.49	27.06	26.05 - 28.07	25.40 - 28.7[illegible]
1965	20.69	19.88 - 21.50	19.37 - 22.01	27.83	26.86 - 28.80	26.23 - 29.43
1966	18.91	18.06 - 19.76	17.52 - 20.30	23.41	21.60 - 25.22	20.43 - 26.39
1967	19.04	18.15 - 19.94	17.58 - 20.51	17.95	16.27 - 19.63	15.18 - 20.72

[1]Averages weighted by companies' defense ECI.

[2]Averages weighted by companies' commercial ECI.

Table VII-18

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	18.15	15.32 - 20.98	13.50 - 22.80	15.75	(1.31) - 32.81	(12.31) - 43.81
1959	20.11	17.93 - 22.29	16.53 - 23.69	28.53	25.38 - 31.68	23.35 - 33.71
1960	14.71	13.24 - 16.18	12.30 - 17.12	27.28	21.77 - 32.79	18.22 - 36.34
1961	12.18	10.15 - 14.21	8.84 - 15.52	32.78	28.15 - 37.41	25.17 - 40.39
1962	12.64	10.85 - 14.43	9.69 - 15.59	28.02	21.98 - 34.06	18.09 - 37.95
1963	8.94	7.58 - 10.30	6.70 - 11.18	24.22	20.46 - 27.98	18.03 - 30.41
1964	7.57	6.05 - 9.09	5.07 - 10.07	27.93	23.03 - 32.83	19.87 - 35.99
1965	11.38	9.44 - 13.32	8.19 - 14.57	30.41	26.93 - 33.89	24.69 - 36.13
1966	13.48	10.80 - 16.16	9.08 - 17.88	35.80	32.28 - 39.32	30.01 - 41.59
1967	18.48	16.01 - 20.96	14.42 - 22.55	22.50	19.02 - 25.97	16.78 - 28.21

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

Table VII-19

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	12.02	8.03 - 16.01	5.45 - 18.59	15.60	6.19 - 25.01	0.13 - 31.07
1959	17.24	14.66 - 19.82	12.99 - 21.49	30.00	25.38 - 34.62	22.41 - 37.59
1960	16.56	10.21 - 22.91	6.11 - 27.01	31.42	25.63 - 37.21	21.90 - 40.94
1961	9.16	6.84 - 11.48	5.35 - 12.97	21.59	18.40 - 24.78	16.34 - 26.84
1962	4.34	(1.03) - 9.71	(4.50) - 13.18	24.64	20.35 - 28.93	17.58 - 31.70
1963	1.26	(2.21) - 4.73	(4.45) - 6.97	20.99	17.08 - 24.90	14.56 - 27.42
1964	(1.34)	(14.59) - 11.91	(23.14) - 20.46	18.21	14.67 - 21.75	12.39 - 24.03
1965	5.46	(3.96) - 14.88	(10.03) - 20.95	21.90	19.00 - 24.80	17.12 - 26.68
1966	10.62	6.68 - 14.56	4.14 - 17.10	26.85	23.77 - 29.93	21.79 - 31.91
1967	22.38	19.45 - 25.32	17.55 - 27.21	24.00	19.98 - 28.01	17.39 - 30.60

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

Table VII-20

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	17.53	16.22 - 18.84	15.37 - 19.69	13.00	8.49 - 17.51	5.58 - 20.42
1959	17.20	15.84 - 18.56	14.97 - 19.43	16.88	14.57 - 19.19	13.08 - 20.68
1960	15.66	13.64 - 17.68	12.34 - 18.98	14.01	11.22 - 16.80	9.41 - 18.61
1961	11.67	10.62 - 12.72	9.95 - 13.39	14.98	12.70 - 17.26	11.23 - 18.73
1962	9.71	7.83 - 11.59	6.61 - 12.81	19.00	16.69 - 21.31	15.21 - 22.79
1963	7.65	6.48 - 8.82	5.72 - 9.58	17.15	15.11 - 19.19	13.80 - 20.50
1964	6.59	2.36 - 10.82	(0.37) - 13.55	17.73	15.87 - 19.59	14.66 - 20.80
1965	10.32	7.56 - 13.08	5.79 - 14.85	19.85	18.04 - 21.66	16.87 - 22.83
1966	11.10	9.68 - 12.52	8.76 - 13.44	20.05	17.96 - 22.14	16.62 - 23.48
1967	14.74	13.16 - 16.33	12.13 - 17.36	15.27	13.31 - 17.23	12.05 - 18.50

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

Table VII-21

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

<u>High and Medium Volume Categories</u>

DEFENSE | COMMERCIAL

Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	20.38	19.31 - 21.45	18.62 - 22.14	13.38	7.98 - 18.78	4.50 - 22.26
1959	19.06	18.01 - 20.11	17.33 - 20.79	13.84	11.78 - 15.90	10.45 - 17.23
1960	16.99	16.10 - 17.88	15.53 - 18.45	9.19	6.46 - 11.92	4.70 - 13.68
1961	14.63	13.76 - 15.50	13.20 - 16.06	13.17	10.37 - 15.97	8.56 - 17.78
1962	14.34	13.50 - 15.18	12.96 - 15.72	18.07	16.05 - 20.09	14.75 - 21.39
1963	12.54	11.89 - 13.19	11.47 - 13.61	17.15	15.52 - 18.78	14.47 - 19.83
1964	12.18	11.49 - 12.87	11.04 - 13.32	20.56	18.75 - 22.37	17.59 - 23.53
1965	14.30	13.47 - 15.13	12.93 - 15.67	21.38	19.7[illegible] - 23.05	18.63 - 24.13
1966	12.97	11.99 - 13.95	11.35 - 14.59	19.71	17.77 - 21.65	16.51 - 22.91
1967	13.02	12.07 - 13.97	11.46 - 14.59	13.43	11.97 - 14.89	11.03 - 15.83

[1]Averages weighted by companies' defense TCI.

[2]Averages weighted by companies' commercial TCI.

Table VII-22

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS
PROFIT/TCI

High Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	21.80	21.15 - 22.45	20.72 - 22.88	14.48	12.08 - 16.88	10.53 - 18.43
1959	19.85	19.18 - 20.52	18.74 - 20.96	10.11	7.81 - 12.41	6.33 - 13.89
1960	18.81	18.16 - 19.46	17.74 - 19.88	4.10	1.03 - 7.17	(0.96) - 9.16
1961	16.88	16.36 - 17.40	16.03 - 17.73	8.08	4.62 - 11.54	2.38 - 13.78
1962	16.41	15.86 - 16.96	15.51 - 17.31	17.33	16.51 - 18.15	15.98 - 18.68
1963	14.90	14.40 - 15.40	14.08 - 15.72	17.88	16.96 - 18.80	16.37 - 19.39
1964	15.01	14.41 - 15.61	14.02 - 16.00	21.94	21.15 - 22.73	20.65 - 23.23
1965	17.06	16.37 - 17.75	15.92 - 18.20	22.03	21.26 - 22.80	20.76 - 23.30
1966	14.39	13.73 - 15.05	13.31 - 15.47	17.61	16.36 - 18.86	15.56 - 19.66
1967	13.66	13.05 - 14.26	12.66 - 14.65	12.76	11.55 - 14.00	10.76 - 14.79

[1]Averages weighted by companies' defense TCI.

[2]Averages weighted by companies' commercial TCI.

Table VII-23

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	14.19	11.95 - 16.43	10.50 - 17.88	11.24	(2.92) - 25.40	(12.06) - 34.54
1959	15.80	14.04 - 17.56	12.90 - 18.70	21.14	18.55 - 23.73	16.88 - 25.40
1960	11.52	10.33 - 12.71	9.56 - 13.48	20.69	16.19 - 25.19	13.28 - 28.10
1961	9.24	7.70 - 10.78	6.70 - 11.78	24.63	21.18 - 28.08	18.96 - 30.30
1962	9.40	7.98 - 10.82	7.07 - 11.73	19.56	15.18 - 23.94	12.36 - 26.76
1963	6.63	5.61 - 7.65	4.96 - 8.30	15.94	12.88 - 19.00	10.91 - 20.97
1964	5.31	4.11 - 6.51	3.34 - 7.28	18.37	14.99 - 21.75	12.82 - 23.92
1965	7.88	6.57 - 9.19	5.72 - 10.04	20.32	17.65 - 22.99	15.93 - 24.71
1966	9.43	7.42 - 11.44	6.12 - 12.74	23.45	20.32 - 26.58	18.31 - 28.59
1967	11.46	9.82 - 13.10	8.76 - 14.16	14.56	12.17 - 16.95	10.63 - 18.49

[1]Averages weighted by companies' defense TCI.

[2]Averages weighted by companies' commercial TCI.

Table VII-24

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Conf. Int.	90% Conf. Int.	Average[2]	68% Conf. Int.	90% Conf. Int.
1958	9.66	6.49 - 12.83	4.45 - 14.87	11.37	3.97 - 18.77	(0.80) - 23.54
1959	13.62	11.37 - 15.87	9.91 - 17.33	24.62	21.26 - 27.98	19.10 - 30.14
1960	13.20	7.93 - 18.47	4.53 - 21.87	25.92	21.49 - 30.35	18.63 - 33.21
1961	7.22	5.24 - 9.20	3.96 - 10.48	17.11	14.44 - 19.78	12.72 - 21.50
1962	3.38	(1.11) - 7.87	(4.01) - 10.77	20.03	16.34 - 23.72	13.96 - 26.10
1963	0.96	(1.77) - 3.69	(3.53) - 5.45	17.1[illegible]	13.67 - 20.63	11.42 - 22.88
1964	(0.97)	(11.50) - 9.56	(18.30) - 16.36	14.61	11.72 - 17.50	9.85 - 19.37
1965	4.29	(2.76) - 11.34	(7.30) - 15.88	18.02	15.68 - 20.36	14.17 - 21.87
1966	8.11	4.99 - 11.23	2.97 - 13.25	20.44	17.64 - 23.24	15.84 - 25.04
1967	17.39	14.74 - 20.04	13.03 - 21.75	17.75	14.28 - 21.23	12.03 - 23.47

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

Table VII-25

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/SALES

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	5.09	3.60 - 7.50	1.60 - 9.20	6.32	(8.70) - 22.70	(20.30) - 34.40
1959	5.33	3.30 - 7.90	1.60 - 9.40	8.15	1.30 - 20.50	(13.70) - 26.80
1960	4.90	2.10 - 7.80	(1.80) - 14.30	6.60	(2.60) - 23.10	(17.00) - 29.40
1961	4.16	2.20 - 7.00	(0.70) - 9.40	7.43	0.40 - 19.60	(13.70) - 26.80
1962	3.47	1.70 - 7.10	(8.20) - 12.40	8.59	2.20 - 15.50	(2.70) - 21.40
1963	2.77	1.60 - 6.90	(4.30) - 8.50	8.41	2.70 - 15.40	(2.60) - 19.90
1964	2.46	0.60 - 8.10	(13.10) - 14.10	8.60	4.60 - 14.00	(0.10) - 17.00
1965	3.92	2.00 - 8.20	(4.00) - 10.90	9.44	5.70 - 14.40	1.60 - 17.40
1966	4.08	1.30 - 8.10	(2.10) - 11.10	9.12	3.80 - 16.00	(0.60) - 19.90
1967	5.14	1.50 - 8.20	(0.30) - 11.60	7.26	1.50 - 14.50	(3.20) - 18.70

[1]Averages weighted by companies' defense sales volume.

[2]Averages weighted by companies' commercial sales volume.

[3]For any fixed amount of Sales, selected at random, there is a 68% (or 90%) probability that Profit/Sales will fall within the indicated range.

Table VII-26

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/SALES

High and Medium Volume Categories

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	5.37	4.00 - 7.30	2.70 - 8.40	6.63	(9.70) - 24.80	(21.80) - 36.80
1959	5.07	3.30 - 7.40	1.80 - 8.60	6.67	(3.60) - 20.90	(17.00) - 29.20
1960	4.53	2.90 - 7.10	1.30 - 8.20	4.29	(8.40) - 21.20	(20.90) - 30.00
1961	4.26	2.70 - 6.40	1.20 - 7.80	5.88	(4.90) - 22.40	(19.50) - 30.10
1962	4.24	2.80 - 6.10	1.60 - 7.20	8.15	2.50 - 14.10	(3.10) - 19.80
1963	3.92	2.70 - 6.10	1.30 - 7.10	8.43	3.60 - 13.80	(0.10) - 17.80
1964	3.97	2.60 - 6.50	0.90 - 7.80	9.61	5.70 - 14.40	0.60 - 19.30
1965	4.84	3.00 - 7.10	1.70 - 8.80	10.11	6.50 - 14.00	3.20 - 18.10
1966	4.47	2.30 - 7.60	0.20 - 9.50	9.16	3.00 - 16.80	(1.80) - 21.10
1967	4.17	1.80 - 7.30	(0.30) - 9.00	6.39	0.10 - 14.40	(5.00) - 18.70

[1]Averages weighted by companies' defense sales volume.

[2]Averages weighted by companies' commercial sales volume.

[3]For any fixed amount of Sales, selected at random, there is a 68% (or 90%) probability that Profit/Sales will fall within the indicated range.

Table VII-27

DEFENSE PROFITS/DEFENSE SALES
HIGH AND MEDIUM VOLUME COMPANIES
DISTRIBUTIONS OF THE RATIO
68% AND 90%

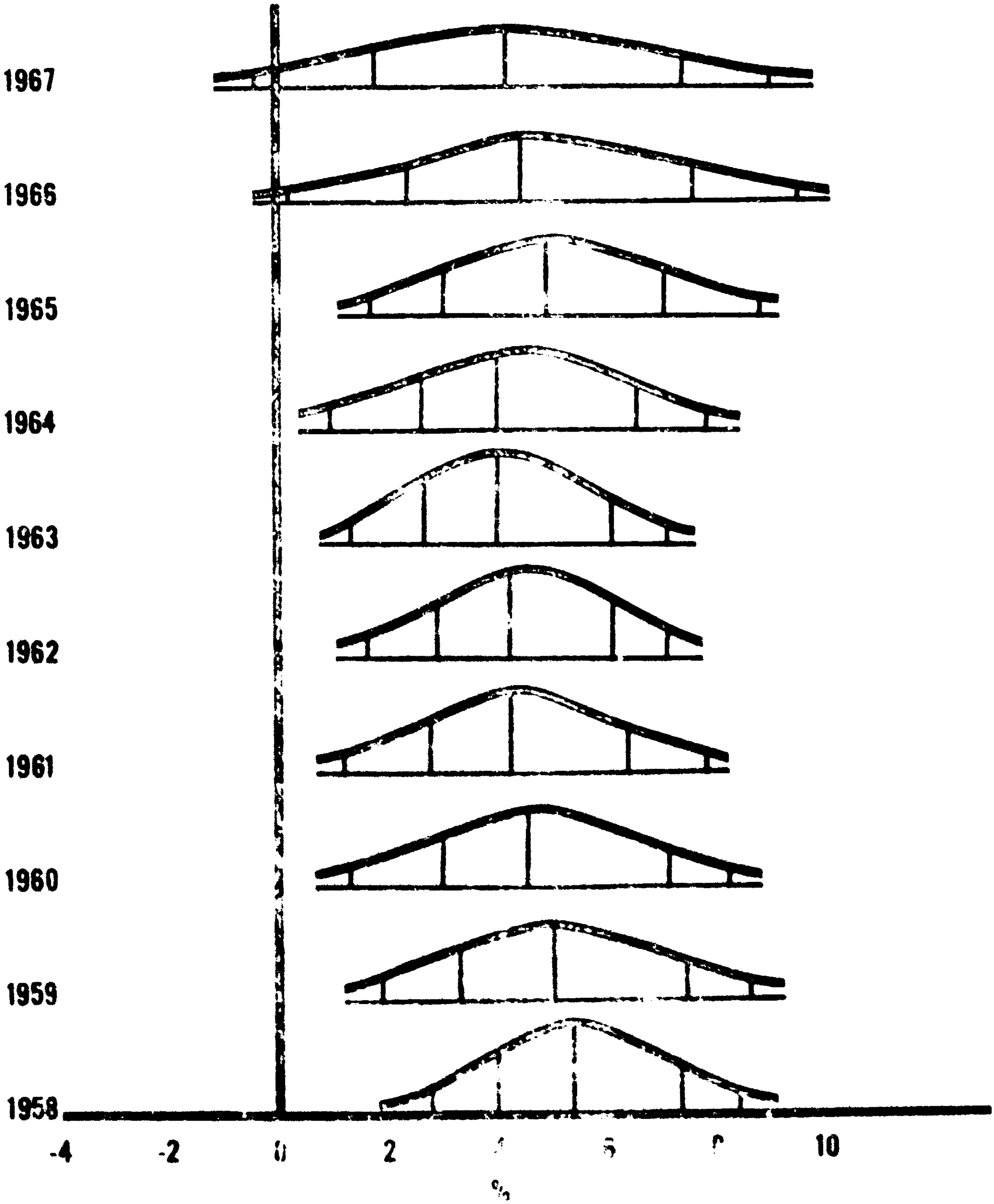


Chart VII-26

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/SALES

High Volume Category

Year	DEFENSE Average[1]	DEFENSE 68% Range[3]	DEFENSE 90% Range[3]	COMMERCIAL Average[2]	COMMERCIAL 68% Range[3]	COMMERCIAL 90% Range[3]
1958	5.41	3.84 - 6.98	2.83 - 7.99	7.26	(8.11) - 22.63	(18.02) - 32.54
1959	5.02	2.95 - 7.09	1.61 - 8.43	5.01	(11.21) - 21.23	(21.67) - 31.69
1960	4.58	2.48 - 6.68	1.13 - 8.03	1.93	(15.00) - 18.86	(25.92) - 29.78
1961	4.33	2.66 - 6.00	1.58 - 7.08	3.69	(13.27) - 20.65	(24.21) - 31.59
1962	4.26	2.69 - 5.83	1.68 - 6.84	7.68	3.22 - 12.14	0.34 - 15.02
1963	4.10	2.52 - 5.68	1.50 - 6.70	8.34	4.00 - 12.68	1.20 - 15.48
1964	4.31	2.57 - 6.05	1.45 - 7.17	9.80	6.69 - 12.91	4.68 - 14.92
1965	5.12	3.19 - 7.05	1.95 - 8.29	10.00	7.16 - 12.84	5.33 - 14.67
1966	4.54	2.20 - 6.88	0.69 - 8.39	8.19	1.05 - 5.33	(3.56) - 19.94
1967	4.04	1.52 - 6.56	(0.11) - 8.19	5.81	(1.70) - 13.32	(6.54) - 18.16

[1] Averages weighted by companies' defense sales volume.

[2] Averages weighted by companies' commercial sales volume.

[3] For any fixed amount of Sales, selected at random, there is a 68% (or 90%) probability that Profit/Sales will fall within the indicated range.

Table VII-29

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	5.13	2.30 - 7.96	0.47 - 9.79	5.44	(16.48) - 27.36	(30.62) - 41.50
1959	5.33	3.12 - 7.54	1.69 - 8.97	9.68	3.02 - 16.34	(1.28) - 20.64
1960	4.30	2.11 - 6.49	0.70 - 7.90	9.47	(0.41) - 19.35	(6.78) - 25.72
1961	3.99	0.67 - 7.31	(1.47) - 9.45	10.52	3.28 - 17.76	(1.39) - 22.43
1962	4.14	1.83 - 6.45	0.34 - 7.94	9.15	(1.72) - 20.02	(8.73) - 27.03
1963	3.14	0.77 - 5.51	(0.76) - 7.04	8.59	1.30 - 15.88	(3.40) - 20.58
1964	2.57	(0.45) - 5.59	(2.40) - 7.54	9.27	0.67 - 17.87	(4.88) - 23.42
1965	3.80	1.12 - 6.48	(0.61) - 8.21	10.30	3.60 - 17.00	(0.72) - 21.32
1966	4.24	(0.16) - 8.64	(3.00) - 11.48	10.87	4.54 - 17.20	0.46 - 21.28
1967	4.59	0.78 - 8.40	(1.68) - 10.86	7.52	1.04 - 13.99	(3.14) - 18.17

[1] Averages weighted by companies' defense sales volume.

[2] Averages weighted by companies' commercial sales volume.

[3] For any fixed amount of Sales, selected at random, there is a 68% (or 90%) probability that Profit/Sales will fall within the indicated range.

Table VII-30

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	3.90	(0.09) - 7.89	(2.66) - 10.46	5.11	(5.64) - 15.86	(12.57) - 22.79
1959	6.18	3.06 - 9.30	1.05 - 11.31	11.92	7.15 - 16.69	4.07 - 19.77
1960	6.08	(3.80) - 15.96	(10.17) - 22.33	12.47	4.73 - 20.21	(0.26) - 25.20
1961	3.88	(1.03) - 8.79	(4.20) - 11.96	9.74	3.78 - 15.70	(0.06) - 19.54
1962	1.69	(8.95) - 12.33	(15.81) - 19.19	9.09	1.54 - 16.64	(3.33) - 21.51
1963	0.45	(5.47) - 6.37	(9.29) - 10.19	8.39	0.36 - 16.42	(4.82) - 21.60
1964	(0.45)	(13.38) - 12.48	(21.72) - 20.82	7.39	2.67 - 12.11	(0.37) - 15.15
1965	2.01	(5.14) - 9.16	(9.75) - 13.77	8.64	3.68 - 13.60	0.48 - 16.80
1966	3.32	(2.08) - 8.72	(5.56) - 12.20	9.07	3.74 - 14.40	0.30 - 17.84
1967	7.03	2.85 - 11.20	0.16 - 13.89	8.44	2.77 - 14.11	(0.89) - 17.76

[1]Averages weighted by companies' defense sales volume.

[2]Averages weighted by companies' commercial sales volume.

[3]For any fixed amount of Sales, selected at random, there is a 68% (or 90%) probability that Profit/Sales will fall within the indicated range.

Table VII-31

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	21.59	7.80 - 39.10	(3.60) - 48.40	17.00	(36.50) - 73.90	(82.40) - 119.00
1959	21.49	8.80 - 34.30	0.60 - 43.10	21.30	(3.00) - 58.70	(47.50) - 81.30
1960	19.48	3.90 - 37.90	(10.60) - 53.30	17.65	(17.60) - 72.40	(78.60) - 103.10
1961	14.75	0.10 - 27.50	(7.50) - 38.70	19.04	(11.30) - 64.10	(121.60) - 147.50
1962	12.42	(0.30) - 34.80	(23.20) - 46.00	24.08	3.10 - 44.90	(11.60) - 60.90
1963	9.92	(0.80) - 28.00	(15.70) - 35.70	22.05	3.50 - 42.90	(9.80) - 55.50
1964	8.69	(8.20) - 40.00	(78.30) - 78.30	22.85	3.40 - 41.90	(9.40) - 56.10
1965	13.14	(4.00) - 41.00	(45.70) - 62.50	25.44	9.00 - 41.20	(1.30) - 53.00
1966	14.78	(1.00) - 32.80	(12.90) - 44.00	27.18	7.80 - 49.70	(9.50) - 67.20
1967	20.37	7.60 - 35.80	(2.50) - 44.30	21.51	1.40 - 44.60	(14.80) - 59.90

[1]Averages weighted by companies' defense ECI.

[2]Averages weighted by companies' commercial ECI.

[3]For any fixed amount of ECI, selected at random, there is a 68% (or 90%) probability that Profit/ECI will fall within the indicated range.

Table VII-32

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High and Medium Volume Categories

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	25.01	12.30 - 41.00	1.70 - 49.50	17.31	(43.00) - 79.10	(90.00) - 126.70
1959	23.66	11.20 - 38.10	2.20 - 46.70	17.71	(15.10) - 62.80	(59.10) - 87.90
1960	21.06	7.50 - 33.90	(0.30) - 43.80	11.76	(38.40) - 76.80	(95.40) - 111.90
1961	18.46	4.40 - 33.50	(5.00) - 43.10	16.84	(72.20) - 108.80	(165.50) - 188.20
1962	18.33	7.00 - 30.70	(0.70) - 38.40	23.53	2.50 - 44.40	(14.50) - 62.50
1963	16.14	6.10 - 27.10	(0.30) - 33.90	23.07	2.90 - 43.60	(9.60) - 58.00
1964	15.56	3.60 - 27.40	(3.00) - 35.90	27.35	7.70 - 48.60	(7.20) - 63.80
1965	18.21	4.00 - 31.70	(4.00) - 41.80	28.71	11.30 - 47.10	(1.00) - 58.60
1966	17.44	3.10 - 33.10	(6.50) - 43.30	27.49	3.10 - 59.10	(19.90) - 75.[illegible]0
1967	18.90	5.00 - 34.70	(4.80) - 44.40	19.52	(4.00) - 46.70	(22.40) - 63.50

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

[3] For any fixed amount of ECI, selected at random, there is a 68% (or 90%) probability that Profit/ECI will fall within the indicated range.

Table VII-33

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	26.52	12.82 - 40.22	3.98 - 49.06	18.02	(33.18) - 69.22	(66.20) - 102.24
1959	24.50	10.90 - 38.10	2.13 - 46.87	12.60	(38.07) - 63.27	(70.75) - 95.95
1960	23.07	8.94 - 37.20	(0.17) - 46.31	5.18	(65.14) - 75.50	(110.50) - 120.86
1961	20.92	5.99 - 35.85	(3.64) - 45.48	10.16	(110.29) - 130.61	(187.98) - 208.30
1962	20.54	8.83 - 32.25	1.28 - 39.80	21.61	4.58 - 38.64	(6.40) - 49.62
1963	18.83	8.86 - 28.80	2.43 - 35.23	22.50	2.65 - 42.35	(10.15) - 55.15
1964	18.40	6.90 - 29.90	(0.52) - 37.32	27.06	9.54 - 44.58	(1.76) - 55.88
1965	20.69	6.69 - 34.69	(2.34) - 43.72	27.83	10.88 - 44.78	(0.05) - 55.71
1966	18.91	4.19 - 33.63	(5.30) - 43.12	23.41	(8.13) - 54.95	(28.47) - 75.29
1967	19.04	3.88 - 34.21	(5.90) - 43.99	17.95	(10.68) - 46.58	(29.15) - 65.05

[1]Averages weighted by companies' defense ECI.

[2]Averages weighted by companies' commercial ECI.

[3]For any fixed amount of ECI, selected at random, there is a 68% (or 90%) probability that Profit/ECI will fall within the indicated range.

Table VII-34

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	18.15	1.71 - 34.59	(8.89) - 45.19	15.75	(77.36) - 108.86	(137.42) - 168.92
1959	20.11	7.45 - 32.77	(0.72) - 40.94	28.53	10.23 - 46.83	(1.57) - 58.63
1960	14.71	6.19 - 23.23	0.69 - 28.73	27.28	(4.72) - 59.28	(25.36) - 79.92
1961	12.18	0.38 - 23.98	(7.23) - 31.59	32.78	5.90 - 59.66	(11.44) - 77.00
1962	12.[illegible]4	2.22 - 23.06	(4.50) - 29.78	28.02	(7.06) - 63.10	(29.69) - 85.73
1963	8.94	1.01 - 16.87	(4.10) - 21.98	24.22	2.35 - 46.09	(11.76) - 60.20
1964	7.57	(1.27) - 16.41	(6.97) - 22.11	27.93	(0.56) - 56.42	(18.94) - 74.80
1965	11.38	0.10 - 22.66	(7.18) - 29.94	30.41	10.19 - 50.63	(2.85) - 63.67
1966	13.48	(2.08) - 29.04	(12.12) - 39.08	35.80	15.34 - 56.26	2.14 - 69.46
1967	18.48	4.13 - 32.84	(5.14) - 42.11	22.50	2.31 - 42.69	(10.71) - 55.71

[1]Averages weighted by companies' defense ECI.

[2]Averages weighted by companies' commercial ECI.

[3]For any fixed amount of ECI, selected at random, there is a 68% (or 90%) probability that Profit/ECI will fall within the indicated range.

Table VII-35

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	12.02	(3.18) - 27.22	(12.98) - 37.02	15.60	(18.92) - 50.12	(41.19) - 72.39
1959	17.24	6.72 - 27.76	(0.07) - 34.55	30.00	11.21 - 48.79	(0.91) - 60.91
1960	16.56	(10.87) - 4[illegible]9	(28.56) - 61.68	31.42	7.14 - 55.70	(8.52) - 71.36
1961	9.16	(1.90) - 20.22	(9.03) - 27.35	21.59	7.06 - 36.12	(2.31) - 45.49
1962	4.34	(23.01) - 31.69	(40.65) - 49.33	24.64	3.63 - 45.60	(9.84) - 59.12
1963	1.26	(16.39) - 18.91	(27.77) - 30.29	20.99	1.91 - 40.07	(10.40) - 52.38
1964	(1.34)	(68.82) - 66.14	(112.34) - 109.66	18.21	0.95 - 35.47	(10.18) - 46.60
1965	5.46	(41.49) - 52.41	(71.77) - 82.69	21.90	8.04 - 35.76	(0.90) - 44.70
1966	10.62	(9.02) - 30.26	(21.69) - 42.93	26.85	11.50 - 42.20	1.60 - 52.10
1967	22.38	9.41 - 35.36	1.04 - 43.72	24.00	6.24 - 41.75	(5.21) - 53.21

[1] Averages weighted by companies' defense ECI.

[2] Averages weighted by companies' commercial ECI.

[3] For any fixed amount of ECI, selected at random, there is a 68% (or 90%) probability that Profit/ECI will fall within the indicated range.

Table VII-36

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Total Population

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	17.53	6.60 - 32.10	(2.80) - 39.40	13.00	(30.90) - 58.50	(68.30) - 98.20
1959	17.20	6.60 - 28.20	(0.10) - 35.90	16.88	(1.90) - 45.40	(35.40) - 63.30
1960	15.66	3.30 - 30.80	(8.90) 43.50	14.01	(12.80) - 56.90	(57.90) - 78.50
1961	11.67	2.60 - 22.90	(4.70) - 28.60	14.98	(5.10) - 43.30	(54.60) - 76.80
1962	9.71	(0.60) - 28.10	(20.00) - 37.10	19.00	2.40 - 37.50	(9.90) - 50.10
1963	7.65	(1.40) - 22.00	(12.70) - 28.80	17.15	1.70 - 35.10	(9.80) - 45.50
1964	6.59	(7.90) - 34.70	(63.10) - 64.10	17.73	3.30 - 33.70	(6.90) - 44.10
1965	10.32	(3.30) - 32.70	(33.20) - 48.50	19.85	7.80 - 33.30	(1.20) - 41.50
1966	11.10	(1.30) - 25.00	(10.40) - 34.00	20.05	4.20 - 38.30	(8.50) - 50.00
1967	14.75	4.40 - 26.10	(2.70) - 33.40	15.27	(0.30) - 33.30	(12.50) - 44.50

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

[3] For any fixed amount of TCI, selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated range.

Table VII-37

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/TCI

High and Medium Volume Categories

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	20.38	10.20 - 33.60	1.70 - 40.70	13.38	(34.60) - 65.60	(76.10) - 104.50
1959	19.06	8.30 - 30.80	1.00 - 38.30	13.84	(11.40) - 47.90	(44.40) - 67.80
1960	16.99	5.80 - 26.80	0.40 - 25.40	9.19	(28.20) - 58.70	(69.80) - 84.30
1961	14.63	5.90 - 24.70	(0.30) - 30.90	13.17	(27.60) - 62.90	(76.00) - 95.90
1962	14.34	5.30 - 24.60	(0.80) - 31.00	18.07	1.10 - 35.30	(11.80) - 48.80
1963	12.54	3.60 - 21.20	(1.10) - 27.50	17.15	1.40 - 34.40	(9.50) - 45.30
1964	12.18	1.30 - 22.30	(4.30) - 29.90	20.56	6.10 - 37.40	(5.50) - 47.80
1965	14.30	2.30 - 25.30	(3.70) - 34.40	21.38	8.00 - 36.10	(1.20) - 45.60
1966	12.97	2.10 - 25.40	(5.70) - 32.90	19.71	0.80 - 41.60	(13.20) - 54.70
1967	13.02	3.70 - 23.80	(3.00) - 30.30	13.43	(3.70) - 32.00	(16.20) - 45.00

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

[3] For any fixed amount of TCI, selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated range.

Table VII-38

DEFENSE PROFITS/DEFENSE TCI
HIGH AND MEDIUM VOLUME COMPANIES
DISTRIBUTIONS OF THE RATIO
68% AND 90%

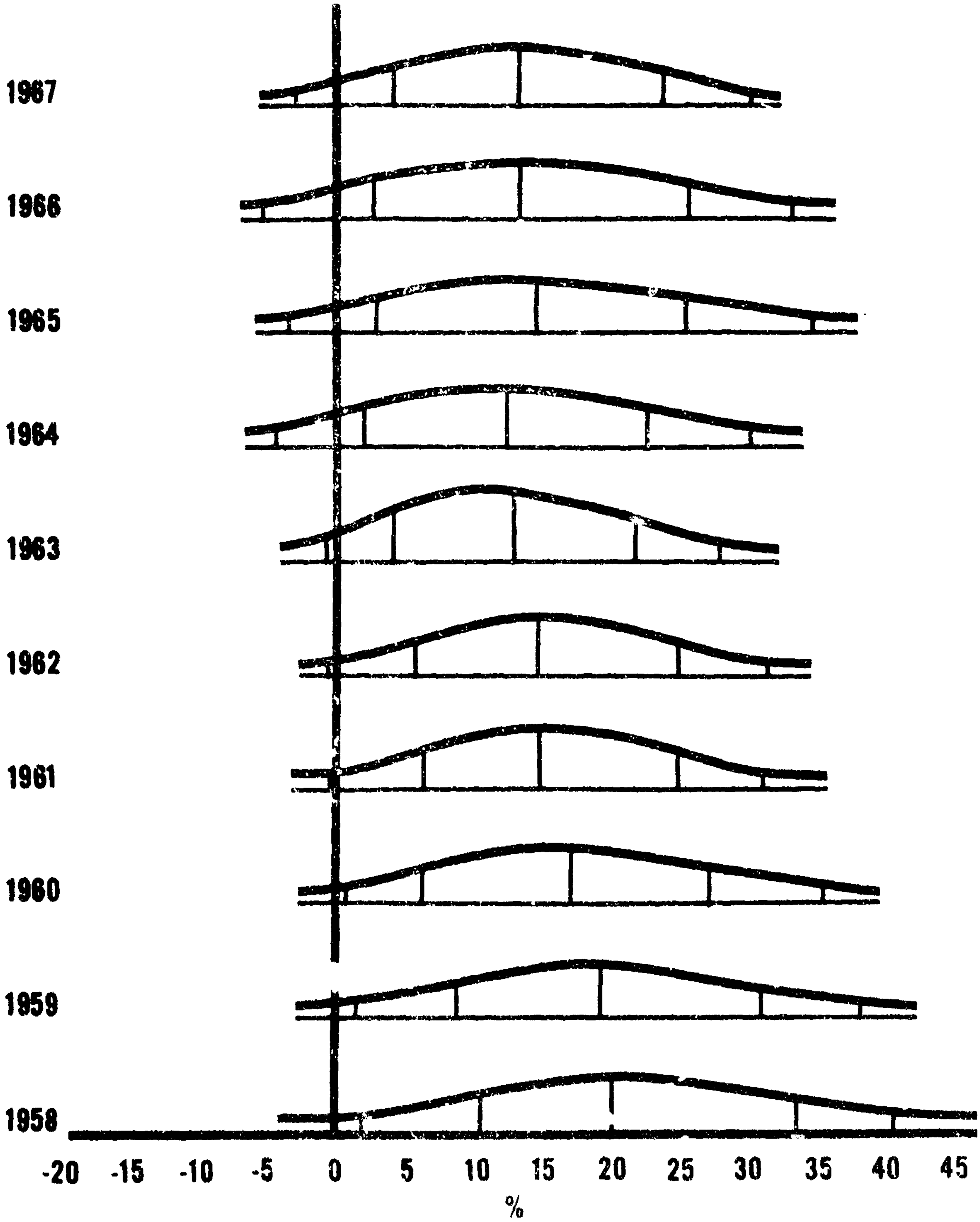


Chart VII-39

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

High Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	21.80	10.67 - 32.93	3.49 - 40.11	14.48	(26.30) - 55.26	(52.60) - 81.56
1959	19.85	8.38 - 31.32	0.98 - 38.72	10.11	(28.92) - 49.14	(54.09) - 74.31
1960	18.81	7.70 - 29.92	0.53 - 37.09	4.10	(48.16) - 56.36	(81.87) - 90.07
1961	16.88	8.11 - 25.65	2.45 - 31.31	8.08	(50.80) - 66.96	(88.78) - 104.94
1962	16.41	6.93 - 25.89	0.82 - 32.00	17.33	3.04 - 31.62	(6.18) - 40.84
1963	14.90	6.28 - 23.52	0.72 - 29.08	17.88	1.94 - 33.82	(8.34) - 44.10
1964	15.01	4.60 - 25.42	(2.11) - 32.13	21.94	8.27 - 35.61	(0.55) - 44.43
1965	17.06	5.05 - 29.07	(2.70) - 36.82	22.03	8.66 - 35.40	0.04 - 44.02
1966	14.39	2.93 - 25.85	(4.46) - 33.24	17.61	(4.04) - 39.26	(18.00) - 53.22
1967	13.66	3.36 - 23.95	(3.28) - 30.59	12.78	(8.04) - 33.59	(21.46) - 47.01

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

[3] For any fixed amount of TCI, selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated range.

Table VII-40

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Medium Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	14.19	1.15 - 27.23	(7.26) - 35.64	11.24	(66.09) - 88.57	(115.97) - 138.45
1959	15.80	5.57 - 26.03	(1.03) - 32.63	21.14	6.08 - 36.20	(3.63) - 45.91
1960	11.52	4.60 - 18.44	0.14 - 22.90	20.69	(5.49) - 46.87	(22.38) - 63.76
1961	9.24	0.27 - 18.21	(5.52) - 24.00	24.63	4.59 - 44.67	(8.34) - 57.60
1962	9.40	1.17 - 17.63	(4.14) - 22.94	19.56	(5.89) - 45.01	(22.31) - 61.43
1963	6.63	0.72 - 12.54	(3.09) - 16.35	15.94	(1.84) - 33.72	(13.31) - 45.19
1964	5.31	(1.65) - 12.27	(6.14) - 16.76	18.37	(1.25) - 37.99	(13.90) - 50.64
1965	7.88	0.24 - 15.52	(4.69) - 20.45	20.32	4.81 - 35.83	(5.19) - 45.83
1966	9.43	(2.28) - 21.14	(9.83) - 28.69	23.45	5.28 - 41.62	(6.44) - 53.34
1967	11.46	1.91 - 21.01	(4.25) - 27.17	14.56	0.67 - 28.45	(8.28) - 37.41

[1]Averages weighted by companies' defense TCI.

[2]Averages weighted by companies' commercial TCI.

[3]For any fixed amount of TCI, selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated range.

Table VII-41

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Low Volume Category

	DEFENSE			COMMERCIAL		
Year	Average[1]	68% Range[3]	90% Range[3]	Average[2]	68% Range[3]	90% Range[3]
1958	9.66	(2.40) - 21.72	(10.18) - 29.50	11.37	(15.78) - 38.52	(33.29) - 56.03
1959	13.62	4.45 - 22.79	(1.46) - 28.70	24.62	10.96 - 38.28	2.15 - 47.09
1960	13.20	(9.55) - 35.95	(24.22) - 50.62	25.92	7.33 - 44.51	(4.66) - 56.50
1961	7.22	(2.24) - 16.68	(8.34) - 22.78	17.11	4.96 - 29.26	(2.88) - 37.10
1962	3.38	(19.47) - 26.23	(34.21) - 40.97	20.03	2.03 - 38.03	(9.58) - 49.64
1963	0.96	(12.94) - 14.86	(21.91) - 23.83	17.15	0.15 - 34.15	(10.82) - 45.12
1964	(0.97)	(54.58) - 52.64	(89.16) - 87.22	14.61	0.50 - 28.72	(8.60) - 37.82
1965	4.29	(30.85) - 39.43	(53.52) - 62.10	18.02	6.86 - 29.18	(0.34) - 36.38
1966	8.11	(7.47) - 23.69	(17.52) - 33.74	20.44	6.49 - 34.39	(2.51) - 43.39
1967	17.39	5.67 - 29.11	(1.89) - 36.66	17.75	2.38 - 33.12	(7.53) - 43.03

[1] Averages weighted by companies' defense TCI.

[2] Averages weighted by companies' commercial TCI.

[3] For any fixed amount of TCI, selected at random, there is a 68% (or 90%) probability that Profit/TCI will fall within the indicated range.

Table VII-42

SECTION VIII

ESTIMATING POPULATION SIZE

A. INTRODUCTION

In order to carry out the statistical approach described in Section VII, it is necessary to estimate the sizes of the population categories. Size estimates must be in terms of numbers of companies, sales volume, ECI, and TCI.

It also is necessary to compute, from the population category size estimate, weighting factors for combining data of two or three categories.

This section describes the steps taken to estimate population size and establish weighting factors.

B. PROCEDURE FOR ESTIMATING DEFENSE SALES VOLUME OF THE POPULATION

Population sales data were not obtainable. It therefore was necessary to estimate population sales volume from data on DoD awards (prime contract business only) to the population. The contractor awards list was the most adequate source of information. That list is a compilation of awards to several thousand companies, including all actions of $10,000 or more. From the list it was possible to obtain data on total defense awards, awards to companies doing more than 10% defense business, awards to companies doing in excess of $1 million in defense business annually, and awards to companies manufacturing durable goods.

For each of the three population categories in each year, the following relationship was hypothesized:

$$\frac{\text{Total defense awards to the sample}}{\text{Total defense awards to the population}} = \frac{\text{Total defense sales for the sample}}{\text{Total defense sales for the population}}$$

That relationship seems logical, so a detailed examination of 1965 data was undertaken. It supported the hypothesis. Therefore the hypothesis was accepted.

As a result, to establish the percentage relationship between the sample defense sales volume and the population defense sales volume, by category, it was necessary only to estimate the total defense awards to the population, by category.

The next step was to develop a relationship between prime and subcontract sales for companies in the population categories. That step was necessary in order to divide award data into the High, Medium and Low volume categories in a manner compatible with the breakdown of defense sales data. The desired relationship was developed from an analysis of all submitted data and is reflected in Chart VIII-1. The resulting definition of High, Medium and Low volume categories in terms of awards, is as follows:

High - Companies with awards in excess $174 million annually

Medium - Companies with awards between $16.75 million and $174 million annually

Low - Companies with awards between $.5 million and $16.75 million annually

Population category awards were estimated, and population defense sales volumes were calculated as follows:

1) High and Medium Volume Population

a. Awards over $25M. The FY '65 "top 100" portion of the DoD contractor awards list represents 68.9% ($16.7B) of the total defense awards ($24.2B), and includes all companies which were awarded $25 million or more in prime contracts.

b. Awards Between $20M and $25M. The Office of the Assistant Secretary of Defense (Comptroller) made available two edited lists (i.e., lists corrected for double-counting, changes in corporate structure, etc.) which together covered the FY '65 prime awards from $20M to $25M. It was necessary to use both lists to assure coverage of all companies in that range. The two lists are:

i. Companies with defense sales too low for inclusion in the FY '65 list of the "top 100."

ii. Companies on the FY '64 list of "top 100" but too small for the FY '65 list of "top 100."

c. Awards Between $16.75M and $20M. The Medium volume population, defined as companies with $25M to $200M in defense sales, is equivalent to companies with awards between $16.75M and $174.0M (See Chart VIII-1). Those companies with awards over $16.75M not already listed were extracted from a special ASD (Comptroller) list of all companies with more than $5M in awards in FY '65.

Companies identified in steps a, b, and c, above, were divided into three classes:

i. those in the sample

ii. those not in the sample, but satisfying the population definition

iii. those not satisfying the population definition

Companies in i. or ii. were separated into those with more than \$174M in DoD awards in FY '65, and those with less than that amount. Those with more than \$174M in awards were considered to be the High volume population. The remainder were considered to constitute the Medium volume population.

Resulting High and Medium population defense award estimates for 1965 were as follows:

Category	Defense Awards
High Volume Population	\$11,457.2M
Medium Volume Population	2,764.6M

2) Low Volume Population

Of total DoD awards of \$24.2B in FY '65 the analysis of High and Medium volume populations (described above) accounted for \$17.6B or almost 73 percent. The \$24.2B total, however, included companies manufacturing non-durable goods or having less than 10 percent or less than \$1M annually in defense sales) The remaining \$6.6B awards were adjusted to obtain an estimate of awards to the Low volume population. Adjustments were made as follows:

a. Subtract 21.82 percent representing non-durable goods. (Assuming that the ratio of major hard goods and miscellaneous hard goods to total awards found for FY '65 in Military Prime Contract Awards,[1] is equivalent to the ratio of durable goods awards to total awards for the Low volume companies.)

b. Subtract 25.0 percent (based on best judgment) representing companies with less than 10 percent defense sales or less than $500K annual defense awards. ($500K awards were used because total defense sales were assumed to be twice awards for Low volume companies, based on the Prime/Sub mix of DoD business in the sample.)

c. Add $186.8M for Low volume subsidiaries of companies identified in paragraph 1, above. Those subsidiaries were taken out of the High and Medium volume categories.

As a result of the above adjustments, FY '65 awards to the Low volume population were estimated to be $4049.4M. Uncertainties regarding the Low volume population and the Low volume sample should be recognized in view of the relatively small sampling of Low volume companies and the variance in data from the sample. That uncertainty is indicated in the confidence interval data in Section VII.

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[1] Military Prime Contract Awards and Subcontract Payments or Commitments, published quarterly by the Office of the Secretary of Defense.

3) Population Defense Award Estimates for Years Prior to and Since 1965

It was hypothesized that defense awards to the High volume sample represent a constant percentage of defense awards to the High volume population for all years. Analysis of the "top 100" lists for FY '60 through FY '65 supports that hypothesis.

As a result of the decision to accept the above hypothesis, and after extensive analysis of the Medium and low volume samples, it was assumed that defense awards to the Medium and Low volume samples represent constant percentages of defense awards to the corresponding populations for all years.

Therefore, it was not necessary to estimate the dollar volume of defense awards to the High, Medium or Low volume populations for years prior to or after 1965.

4) Sample Defense Sales Volume as a Percent of Population Sales Volume

Based on ample data and the estimates obtained in paragraphs 1 and 2, above, the following calculations were made for 1965:

	I	II	III
Category	Sample Defense Awards	Population Defense Awards	I as a % of II
High volume	$10,585.0	$11,457.2M	92.39
Medium volume	1,373.3	2,764.6M	49.67
Low volume	140.0	4,049.4M	3.46

In conformance with the hypothesis stated at the beginning of paragraph 3, the percentages in column III, above, were accepted as representing the relationship between sample defense sales and population defense sales for 1965. Consistent with the statements in paragraph 3, above, those percentages were accepted as representing the same relationship for all other years in the study.

5) Estimates of Population Defense Sales and Calculation of Category Defense Sales Weightings

To calculate total population profit averages and their associated confidence intervals, it is necessary to weight the individual category (High, Medium, and Low volume) data in proportion to the dollar volumes of the category populations. For profit/sales data, weightings were obtained as indicated in Table VIII-2.

C. SAMPLE DEFENSE CAPITAL INVESTMENT AS A PERCENT OF POPULATION CAPITAL INVESTMENT

The sample includes the same durable goods manufacturing industries as does the population. Moreover, those industries are represented in approximately the same proportion in the sample and in the population. As a result, it is assumed that

$$\frac{\text{sample defense investment}^1}{\text{population defense investment}^1} = \frac{\text{sample defense sales}}{\text{population defense sales}}$$

= .9239 for the High volume category

= .4967 for the Medium volume category

= .0346 for the Low volume category

The population estimates for defense equity capital investment (ECI), and the defense ECI weighting factors by population category, are presented in Table VIII-3. The same information for defense total capital investment (TCI) is shown in Table VIII-4.

---

[1] Equity capital investment or total capital investment.

D. ESTIMATES OF POPULATION COMMERCIAL SALES AND INVESTMENT AND CALCULATION OF CORRESPONDING WEIGHTINGS FOR THE DEFENSE VOLUME CATEGORIES

1) Procedure for Estimating Commercial Sales Volume of the Population

The problem of obtaining commercial (non-government) sales data for the population is even more difficult than that of obtaining defense sales data. Therefore, it was hypothesized that the following ratio is true for each category:

$$\frac{\text{Defense sales}^{1}\text{ for the sample}}{\text{Commercial sales for the sample}} = \frac{\text{Defense sales}^{1}\text{ for the population}}{\text{Commercial sales for the population}}$$

Analysis of High volume data for defense and commercial sales of the samples and populations supported acceptance of the hypothesis. Based on the hypothesis, the following relationship is true for each category:

$$\frac{\text{Defense sales}^{1}\text{ for the sample}}{\text{Defense sales}^{1}\text{ for the population}} = \frac{\text{Commercial sales for the sample}}{\text{Commercial sales for the population}}$$

Therefore the ratio of sample commercial sales to population commercial sales

= .9239 for the High defense volume category

= .4967 for the Medium defense volume category

= .0346 for the Low defense volume category

Resulting population estimates for commercial sales, and corresponding weighting factors, are given in Table VIII-5.

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[1] Prime and subcontract.

2) <u>Procedure for Estimating Commercial ECI and TCI for the Population</u>

For reasons analogous to those presented in the discussion of defense investment estimates in Part C, sample investment/population investment ratios for commercial business were considered to be the same as the sample sales/population sales ratios for commercial business.

$$\frac{\text{Commercial ECI for the sample}}{\text{Commercial ECI for the population}} = \frac{\text{Commercial TCI for the sample}}{\text{Commercial TCI for the population}}$$

$= .9239$ for the High defense volume category

$= .4967$ for the Medium defense volume category

$= .0346$ for the Low defense volume category

Resulting population estimates for commercial ECI and TCI, and corresponding weighting factors, are given in Tables VIII-6 and VIII-7.

E. CALCULATION OF WEIGHTING FACTORS FOR COMBINING HIGH AND MEDIUM VOLUME CATEGORY SAMPLE DATA

In addition to combined averages for High, Medium and Low volume categories, combined averages for High and Medium volume categories were calculated. The reason for obtaining averages which do not include Low volume company data was to eliminate the lower reliability of results incorporating those data. The High and Medium volume category data are more reliable because the associated samples are much larger and the variance in sample data much smaller.

The data of Tables VIII-2 through VIII-7 were recalculated for use in combining High and Medium volume category data. The revised tables are numbered VIII-8 through VIII-13.

RELATIONSHIP BETWEEN DEFENSE SALES VOLUME & % SUBCONTRACT SALES

(BASED ON 1965 SAMPLE DATA)

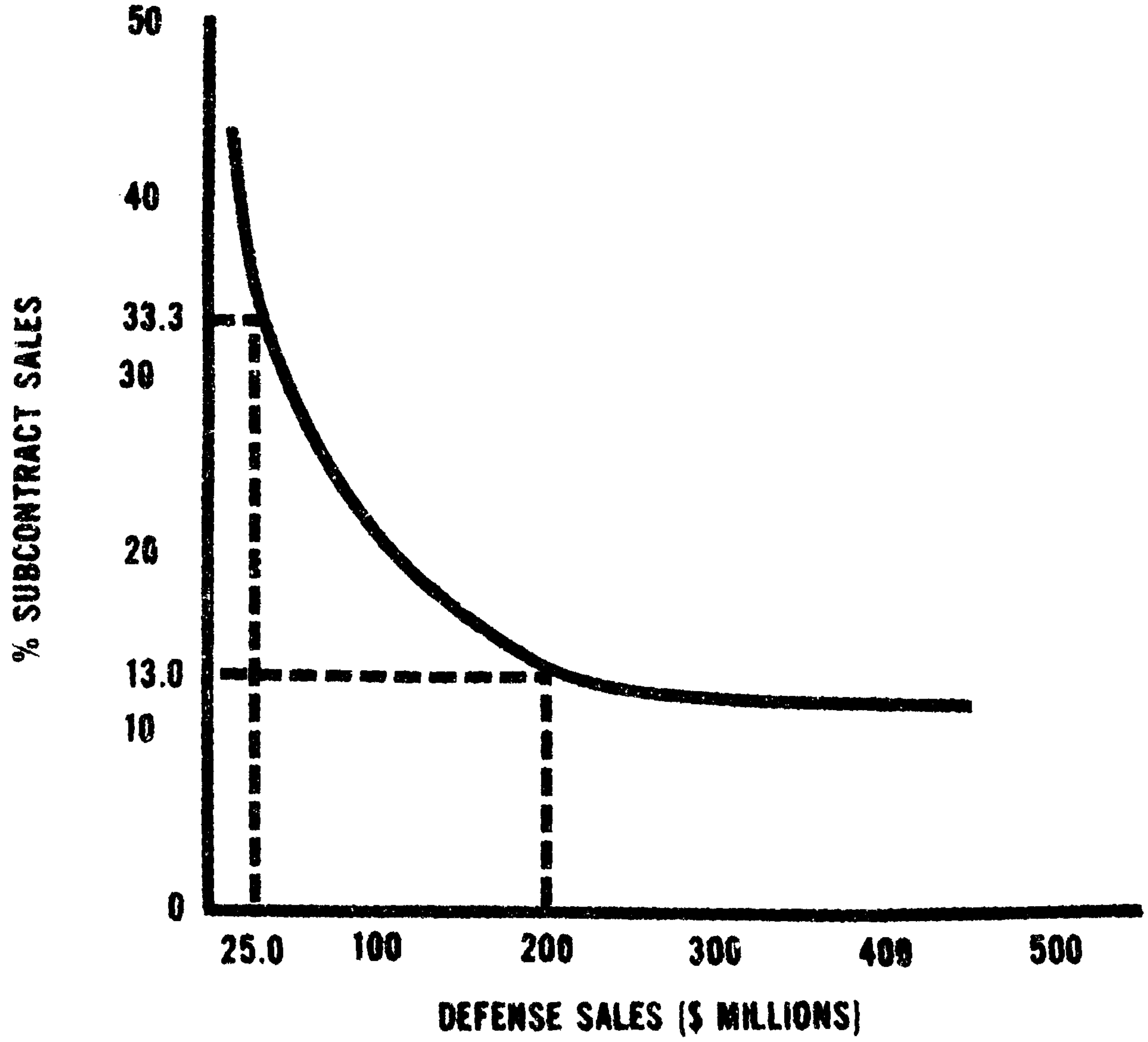

Chart VIII-1

Table VIII-2

Defense Sales

High, Medium and Low Defense Volume

	Sample Defense Sales	% Population	Estimated Population	Def. Sales Weightings
1967				
High	$15,410.6M	.9239	$16,679.9M	50.74
Med.	2,484.4M	.4967	5,001.8M	15.22
Low	313.3M	.0280	11,189.3M	34.04
			$32,871.0M	
1966				
High	$12,799.2M	.9239	$13,853.4M	51.06
Med.	1,939.2M	.4967	3,904.2M	14.39
Low	324.3M	.0346	9,373.0M	34.55
			$27,130.6M	
1965				
High	$11,153.1M	.9239	$12,071.8M	53.33
Med.	1,606.3M	.4967	3,233.9M	14.29
Low	253.6M	.0346	7,329.9M	32.38
			$22,635.6M	
1964				
High	$11,932.8M	.9239	$12,915.7M	52.88
Med.	1,566.8M	.4967	3,154.4M	12.91
Low	289.1M	.0346	8,356.4M	34.21
			$24,426.5M	
1963				
High	$13,231.0M	.9239	$14,320.8M	54.39
Med.	1,650.5M	.4967	3,322.9M	12.62
Low	300.6M	.0346	8,687.6M	32.99
			$26,331.3M	
1962				
High	$13,581.2M	.9239	$14,699.1M	55.98
Med.	1,798.7M	.4967	3,621.3M	13.79
Low	274.6M	.0346	7,936.9M	30.23
			$26,257.3M	
1961				
High	$12,542.0M	.9239	$13,575.1M	58.85
Med.	1,669.5M	.4967	3,361.9M	14.57
Low	212.1M	.0346	6,131.0M	26.58
			$23,068.0M	
1960				
High	$11,899.2M	.9239	$12,879.3M	62.51
Med.	1,381.8M	.4967	2,782.0M	13.50
Low	171.0M	.0346	4,942.7M	23.99
			$20,604.0M	

Defense: Sales (Cont.)

High, Medium and Low Defense Volume

	Sample Defense Sales	% Population	Estimated Population	Def. Sales Weightings
1959				
High	$12,172.8M	.9239	$13,175.5M	64.75
Med.	1,199.1M	.4967	2,414.2M	11.87
Low	164.6M	.0346	4,757.2M	23.38
			$20,346.9M	
1958				
High	$11,710.1M	.9239	$12,674.6M	69.78
Med.	995.6M	.4967	2.004.4M	11.04
Low	120.5M	.0346	3,482.8M	19.18
			$18.161.8M	

Defense: ECI

High, Medium and Low Defense Volume

	Sample Defense ECI	% Population	Estimated Population	Def. ECI Weightings
1967				
High	$ 3,270.1M	.9239	$ 3,539.5M	42.68
Med.	617.1M	.4967	1,242.4M	14.98
Low	98.3M	.0280	3,510.7M	42.34
			$ 8,292.6	
1966				
High	$ 3,074.5M	.9239	$ 3,327.7M	44.55
Med.	609.9M	.4967	1,227.9M	16.40
Low	101.4M	.0346	2,930.8M	39.15
			$ 7,486.4M	
1965				
High	$ 2,760.4M	.9239	$ 2,987.7M	44.20
Med.	536.9M	.4967	1,081.0M	15.99
Low	93.1M	.0346	2,691.6M	39.81
			$ 6,760.3M	
1964				
High	$ 2,792.9M	.9239	$ 3,023.0M	43.80
Med.	531.9M	.4967	1,070.9M	15.52
Low	97.1M	.0346	2,807.2M	40.68
			$ 6,901.1M	
1963				
High	$ 2,883.6M	.9239	$ 3,121.1M	42.36
Med.	579.7M	.4967	1,167.2M	15.84
Low	106.6M	.0346	3,080.5M	41.80
			$ 7,368.8M	
1962				
High	$ 2,815.2M	.9239	$ 3,047.0M	41.64
Med.	589.0M	.4967	1,185.8M	16.21
Low	106.7M	.0346	3,084.0M	42.15
			$ 7,316.8M	
1961				
High	$ 2,598.3M	.9239	$ 2,812.3M	43.20
Med.	546.5M	.4967	1,100.2M	16.90
Low	89.9M	.0346	2,597.2M	39.90
			$ 6,509.7M	
1960				
High	$ 2,364.4M	.9239	$ 2,559.1M	49.33
Med.	404.4M	.4967	814.1M	15.69
Low	62.8M	.0346	1,814.7M	34.98
			$ 5,187.9M	

Table VIII-3

Defense: ECI (Cont.)

High, Medium and Low Defense Volume

	Sample Defense ECI	% Population	Estimated Population	Def. ECI Weightings
1959				
High	$ 2,496.2M	.9239	$ 2,701.8M	53.53
Med.	317.8M	.4967	639.9M	12.68
Low	59.0M	.0346	1,705.7M	33.79
			$ 5,047.4M	
1958				
High	$ 2,389.5M	.9239	$ 2,586.3M	60.40
Med.	281.3M	.4967	566.4M	13.23
Low	39.1M	.0346	1,129.0M	26.37
			$ 4,281.7M	

Defense· TCI

High, Medium and Low Defense Volume

	Sample Defense TCI	% Population	Estimated Population	Def. TCI Weightings
1967				
High	$ 4,560.1M	.9239	$ 4.935.7M	43.06
Med.	995.4M	.4967	2.004.0M	17.49
Low	126.6M	.0280	4,521.4M	39.45
			$11 461.1M	
1966				
High	$ 4,039.3M	.9239	$ 4.372.0M	43.88
Med.	871.8M	.4967	1.755.2M	17.61
Low	132.8M	.0346	3.836.9M	38.51
			$ 9.964.1M	
1965				
High	$ 3,347.8M	.9239	$ 3,623.5M	42.07
Med.	775.2M	.4967	1.560.7M	18.12
Low	118.7M	.0346	3.429.5M	39.81
			$ 8,613.7M	
1964				
High	$ 3,425.3M	.9239	$ 3,707.4M	40.74
Med.	759.2M	.4967	1,528.5M	16.80
Low	133.7M	.0346	3.863.6M	42.46
			$ 9.099.5M	
1963				
High	$ 3,644.0M	.9239	$ 3,944.1M	41.32
Med.	781.2M	.4967	1.572.8M	16.48
Low	139.4M	.0346	4,028.3M	42.20
			$ 9,545.2M	
1962				
High	$ 3,524.2M	.9239	$ 3 814.7M	40.70
Med.	792.2M	.4967	1,595.0M	17.02
Low	137.1M	.0346	3,962.6M	42.28
			$ 9,372.1M	
1961				
High	$ 3,221.1M	.9239	$ 3 486.4M	42.36
Med.	720.6M	.4967	1.450.8M	17.62
Low	114.0M	.0346	3 294.5M	40.02
			$ 8,231.7M	
1960				
High	$ 2,899.6M	.9239	$ 3.138.5M	48.63
Med.	516.1M	.4967	1,039.0M	16.10
Low	78.7M	.0346	2,275.9M	35.27
			$ 6,453.4M	

Defense: TCI (Cont.)

High, Medium and Low Defense Volume

	Sample Defense TCI	% Population	Estimated Population	Def. TCI Weightings
1959				
High	$ 3,081.5M	.9239	$ 3,335.3M	52.87
Med.	404.5M	.4967	814.4M	12.91
Low	74.7M	.0346	2,159.0M	34.22
			$ 6,308.7M	
1958				
High	$ 2,907.1M	.9239	$ 3,146.5M	59.66
Med.	359.9M	.4967	724.5M	13.73
Low	48.6M	.0346	1,403.9M	26.61
			$ 5,274.9M	

Commercial: Sales

High, Medium and Low Defense Volume

	Sample Commercial Sales	% Population	Estimated Population	Commercial Sales Weightings
1967				
High	$13,840.9M	.9239	$14,980.9M	38.02
Med.	3,789.8M	.4967	7,630.0M	19.36
Low	470.2M	.0280	16,792.9M	42.62
			$39,403.8M	
1966				
High	$10,382.9M	.9239	$11,238.1M	33.61
Med.	3,154.0M	.4967	6,349.9M	18.99
Low	548.4M	.0346	15,849.7M	47.40
			$33,437.7M	
1965				
High	$ 8,749.9M	.9239	$ 9,470.6M	35.40
Med.	2,585.0M	.4967	5,204.3M	19.45
Low	418.0M	.0346	12,080.9M	45.15
			$26,755.8M	
1964				
High	$ 7,477.9M	.9239	$ 8,093.8M	34.94
Med.	2,230.0M	.4967	4,489.6M	19.38
Low	366.2M	.0346	10,583.8M	45.68
			$23,167.2M	
1963				
High	$ 6,651.5M	.9239	$ 7,199.4M	35.05
Med.	1,852.0M	.4967	3,728.6M	18.15
Low	332.6M	.0346	9,612.7M	46.80
			$20,540.7M	
1962				
High	$ 6,756.9M	.9239	$ 7,313.4M	35.90
Med.	1,694.5M	.4967	3,411.5M	16.74
Low	333.8M	.0346	9,647.4M	47.36
			$20,372.3M	
1961				
High	$ 6,463.7M	.9239	$ 6,996.1M	40.66
Med.	1,552.0M	.4967	3,326.0M	19.33
Low	238.2M	.0346	6,884.4M	40.01
			$17,206.5M	
1960				
High	$ 6,581.9M	.9239	$ 7,124.0M	49.34
Med.	1,611.2M	.4967	3,243.8M	22.47
Low	140.8M	.0346	4,069.4M	28.19
			$14,437.2M	

Commercial: Sales (Cont.)

High, Medium and Low Defense Volume

	Sample Commercial Sales	% Population	Estimated Population	Commercial Sales Weightings
1959				
High	$ 5,372.5M	.9239	$ 5,815.0M	46.26
Med.	1,598.2M	.4967	3,217.6M	25.60
Low	122.4M	.0346	3,537.6M	28.14
			$12,570.2M	
1958				
High	$ 4,702.1M	.9239	$ 5,089.4M	52.01
Med.	1,342.2M	.4967	2,702.2M	27.61
Low	69.0M	.0346	1,994.2M	20.38
			$ 9,785.8M	

Commercial: ECI

High, Medium and Low Defense Volume

	Sample Commercial ECI	% Population	Estimated Population	Commercial ECI Weightings
1967				
High	$ 4,478.6M	.9239	$ 4,847.5M	36.45
Med.	1,265.9M	.4967	2,548.6M	19.16
Low	165.3M	.0280	5,903.6M	44.39
			$13,299.7M	
1966				
High	$ 3,632.7M	.9239	$ 3,931.9M	35.07
Med.	957.8M	.4967	1,928.3M	17.20
Low	185.2M	.0346	5,352.6M	47.73
			$11,212.8M	
1965				
High	$ 3,145.0M	.9239	$ 3,404.0M	34.26
Med.	875.3M	.4967	1,762.2M	17.74
Low	165.0M	.0346	4,768.8M	48.00
			$ 9,935.0M	
1964				
High	$ 2,706.9M	.9239	$ 2,929.9M	33.63
Med.	739.8M	.4967	1,489.4M	17.10
Low	148.5M	.0346	4,291.9M	49.27
			$ 8,711.2M	
1963				
High	$ 2,466.2M	.9239	$ 2,669.3M	34.11
Med.	656.5M	.4967	1,321.7M	16.89
Low	13[illegible] 7M	.0346	3,835.3M	49.00
			$ [illegible]26.3M	
1962				
High	$ 2,400.1M	.9239	$ 2,597.8M	35.72
Med.	553.3M	.4967	1,114.0M	15.32
Low	123.2M	.0346	3,560.7M	48.96
			$ 7,272.5M	
1961				
High	$ 2,351.0M	.9239	$ 2,544.6M	37.89
Med.	530.1M	.4967	1,067.2M	15.89
Low	107.4M	.0346	3,104.0M	46.22
			$ 6,715.8M	
1960				
High	$ 2,452.7M	.9239	$ 2,654.7M	49.19
Med.	559.5M	.4967	1,126.4M	20.87
Low	55.9M	.0346	1,615.6M	29.94
			$ 5,396.7M	

Commercial: ECI (Cont.)

High, Medium and Low Defense Volume

	Sample Commercial ECI	% Population	Estimated Population	Commercial ECI Weightings
1959				
High	$ 2,137.6M	.9239	$ 2,313.7M	48.11
Med.	542.0M	.4967	1,091.2M	22.69
Low	48.6M	.0346	1,404.6M	29.20
			$ 4,809.5M	
1958				
High	$ 1,893.5M	.9239	$ 2,049.5M	56.38
Med.	463.2M	.4967	932.6M	25.65
Low	22.6M	.0346	653.2M	17.97
			$ 3,635.3M	

Commercial: TCI

High, Medium and Low Defense Volume

	Sample Commercial TCI	% Population	Estimated Population	Commercial TCI Weightings
1967				
High	$ 6,292.7M	.9239	$ 6,811.0M	36.36
Med.	1,956.0M	.4967	3,938.0M	21.02
Low	223.5M	.0280	7,982.1M	42.62
			$18,731.1M	
1966				
High	$ 4,828.0M	.9239	$ 5,225.7M	34.37
Med.	1,462.2M	.4967	2,943.8M	19.36
Low	243.4M	.0346	7,034.7M	46.27
			$15,204.2M	
1965				
High	$ 3,973.0M	.9239	$ 4,300.2M	33.77
Med.	1,310.0M	.4967	2,637.4M	20.72
Low	200.5M	.0346	5,794.8M	45.51
			$12,732.4M	
1964				
High	$ 3,339.4M	.9239	$ 3,614.5M	32.19
Med.	1,124.9M	.4967	2,264.7M	20.17
Low	185.1M	.0346	5,349.7M	47.64
			$11,228.9M	
1963				
High	$ 3,103.1M	.9239	$ 3,358.7M	33.38
Med.	997.8M	.4967	2,008.8M	19.97
Low	162.4M	.0346	4,693.6M	46.65
			$10,061.1M	
1962				
High	$ 2,993.6M	.9239	$ 3,240.2M	35.17
Med.	792.4M	.4967	1,595.3M	17.31
Low	151.5M	.0346	4,378.6M	47.52
			$ 9,214.1M	
1961				
High	$ 2,955.4M	.9239	$ 3,198.8M	37.48
Med.	705.5M	.4967	1,420.4M	16.64
Low	135.5M	.0346	3,916.2M	45.88
			$ 8,535.4M	
1960				
High	$ 3,098.6M	.9239	$ 3,353.8M	49.35
Med.	737.9M	.4967	1,485.6M	21.86
Low	67.7M	.0346	1,956.6M	28.79
			$ 6,796.0M	

Commercial: TCI (Cont.)

High, Medium and Low Defense Volume

	Sample Commercial TCI	% Population	Estimated Population	Commercial TCI Weightings
1959				
High	$ 2,663.9M	.9239	$ 2,883.3M	47.50
Med.	731.4M	.4967	1,472.5M	24.26
Low	59.3M	.0346	1,713.9M	28.24
			$ 6,069.7M	
1958				
High	$ 2,357.2M	.9239	$ 2,551.4M	53.66
Med.	649.3M	.4967	1,307.2M	27.49
Low	31.0M	.0346	896.0M	18.85
			$ 4,754.6M	

Defense: Sales

High and Medium Defense Volume

	Sample Defense Sales	% Population	Estimated Population	Def. Sales Weightings
1967				
High	$15,410.6M	.9239	$16,679.9M	76.93
Med.	2,484.4M	.4967	5,001.8M	23.07
			$21,681.7M	
1966				
High	$12,799.2M	.9239	$13,853.4M	78.01
Med.	1,939.2M	.4967	3,904.2M	21.99
			$17,757.6M	
1965				
High	$11,153.1M	.9239	$12,071.8M	78.87
Med.	1,606.3M	.4967	3,233.9M	21.13
			$15,305.7M	
1964				
High	$11,932.8M	.9239	$12,915.7M	80.37
Med.	1,566.8M	.4967	3,154.4M	19.63
			$16,070.1M	
1963				
High	$13,231.0M	.9239	$14,320.8M	81.17
Med.	1,650.5M	.4967	3,322.9M	18.83
			$17,643.7M	
1962				
High	$13,581.2M	.9239	$14,699.1M	80.23
Med.	1,798.7M	.4967	3,621.3M	19.77
			$18,320.4M	
1961				
High	$12,542.0M	.9239	$13,575.1M	80.15
Med.	1,669.5M	.4967	3,361.9M	19.85
			$16,937.0M	
1960				
High	$11,899.2M	.9239	$12,879.3M	82.24
Med.	1,381.8M	.4967	2,782.0M	17.76
			$15,661.3M	
1959				
High	$12,172.8M	.9239	$13,175.5M	84.51
Med.	1,199.1M	.4967	2,414.2M	15.49
			$15,589.7M	
1958				
High	$11,710.1M	.9239	$12,674.6M	86.34
Med.	995.6M	.4967	2,004.4M	13.66
			$14,679.0M	

Defense: ECI

High and Medium Defense Volume

	Sample Defense ECI	% Population	Estimated Population	Def. ECI Weightings
1967				
High	$ 3,270.1M	.9239	$ 3,539.5M	74.02
Med.	617.1M	.4967	$ 1,242.4M	25.98
			$ 4,781.9M	
1966				
High	$ 3,074.5M	.9239	$ 3,327.7M	73.05
Med.	609.9M	.4967	1,227.9M	26.95
			$ 4,555.6M	
1965				
High	$ 2,760.4M	.9239	$ 2,987.7M	73.43
Med.	536.9M	.4967	1,081.0M	26.57
			$ 4,068.7M	
1964				
High	$ 2,792.9M	.9239	$ 3,023.0M	73.84
Med.	531.9M	.4967	1,070.9M	26.16
			$ 4,093.9M	
1963				
High	$ 2,883.6M	.9239	$ 3,121.1M	72.78
Med.	579.7M	.4967	1,167.2M	27.22
			$ 4,288.3M	
1962				
High	$ 2,815.2M	.9239	$ 3,047.0M	71.99
Med.	589.0M	.4967	1,185.8M	28.01
			$ 4,232.8M	
1961				
High	$ 2,598.3M	.9239	$ 2,812.3M	71.88
Med.	546.5M	.4967	1,100.2M	28.12
			$ 3,912.5M	
1960				
High	$ 2,364.4M	.9239	$ [illegible],559.1M	75.87
Med.	404.4M	.4967	814.1M	24.13
			$ 3,373.2M	
1959				
High	$ 2,496.2M	.9239	$ 2,701.8M	80.86
Med.	317.8M	.4967	639.9M	19.14
			$ 3,341.7M	
1958				
High	$ 2,389.5M	.9239	$ 2,586.3M	82.03
Med.	281.3M	.4967	566.4M	17.97
			$ 3,152.7M	

Defense: TCI

High and Medium Defense Volume

	Sample Defense TCI	% Population	Estimated Population	Def. TCI Weightings
1967				
High	$ 4,560.1M	.9239	$ 4,935.7M	71.12
Med.	995.4M	.4967	2,004.0M	28.88
			$ 6,939.7M	
1966				
High	$ 4,039.3M	.9239	$ 4,372.0M	71.35
Med.	871.8M	.4967	1,755.2M	28.65
			$ 6,127.2M	
1965				
High	$ 3,347.8M	.9239	$ 3,623.5M	69.90
Med.	775.2M	.4967	1,560.7M	30.10
			$ 5,184.2M	
1964				
High	$ 3,425.3M	.9239	$ 3,707.4M	70.81
Med.	759.2M	.4967	1,528.5M	29.19
			$ 5,235.9M	
1963				
High	$ 3,644.0M	.9239	$ 3,944.1M	71.49
Med.	781.2M	.4967	1,572.8M	28.51
			$ 5,516.9M	
1962				
High	$ 3,524.2M	.9239	$ 3,814.5M	70.51
Med.	792.2M	.4967	1,595.0M	29.49
			$ 5,409.5M	
1961				
High	$ 3,221.1M	.9239	$ 3,486.4M	70.61
Med.	720.6M	.4967	1,450.8M	29.39
			$ 4,937.2M	
1960				
High	$ 2,899.6M	.9239	$ 3,138.5M	75.13
Med.	516.1M	.4967	1,039.0M	24.87
			$ 4,177.5M	
1959				
High	$ 3,081.5M	.9239	$ 3,335.3M	80.37
Med.	404.5M	.4967	814.4M	19.63
			$ 4,149.7M	
1958				
High	$ 2,907.1M	.9239	$ 3,146.5M	81.28
Med.	359.9M	.4967	724.5M	18.72
			$ 3,871.0M	

Commercial: Sales

High and Medium Defense Volume

	Sample Commercial Sales	% Population	Estimated Population	Commercial Sales Weightings
1967				
High	$13,840.9M	.9239	$14,980.9M	66.26
Med.	3,789.8M	.4967	7,630.0M	33.74
			$22,610.9M	
1966				
High	$10,382.9M	.9239	$11,238.1M	63.90
Med.	3,154.0M	.4967	6,349.9M	36.10
			$17,588.0M	
1965				
High	$ 8,749.9M	.9239	$ 9,470.6M	64.54
Med.	2,585.0M	.4967	5,204.3M	35.46
			$14,674.9M	
1964				
High	$ 7,477.9M	.9239	$ 8,093.8M	64.32
Med.	2,230.0M	.4967	4,489.6M	35.68
			$12,583.4M	
1963				
High	$ 6,651.5M	.9239	$ 7,199.4M	65.88
Med.	1,852.0M	.4967	3,728.6M	34.12
			$10,928.0M	
1962				
High	$ 6,756.9M	.9239	$ 7,313.4M	68.19
Med.	1,694.5M	.4967	3,411.5M	31.81
			$10,724.9M	
1961				
High	$ 6,463.7M	.9239	$ 6,996.1M	67.78
Med.	1,652.0M	.4967	3,326.0M	32.22
			$10,322.1M	
1960				
High	$ 6,581.9M	.9239	$ 7,124.0M	68.71
Med.	1,611.2M	.4967	3,243.8M	31.29
			$10,367.8M	
1959				
High	$ 5,372.5M	.9239	$ 5,815.0M	64.38
Med.	1,598.2M	.4967	3,217.6M	35.62
			$ 9,032.6M	
1958				
High	$ 4,702.1M	.9239	$ 5,089.4M	65.32
Med.	1,342.2M	.4967	2,702.2M	34.68
			$ 7,791.6M	

Table VIII-12

Commercial: ECI

High and Medium Defense Volume

	Sample Commercial ECI	% Population	Estimated Population	Commercial ECI Weightings
1967				
High	$ 4,478.6M	.9239	$ 4,847.5M	65.54
Med.	1,265.9M	.4967	2,548.6M	34.46
			$ 7,396.1M	
1966				
High	$ 3,632.7M	.9239	$ 3,931.9M	67.09
Med.	957.8M	.4967	1,928.3M	32.91
			$ 5,860.2M	
1965				
High	$ 3,145.0M	.9239	$ 3,404.0M	65.89
Med.	875.3M	.4967	1,762.2M	34.11
			$ 5,166.2M	
1964				
High	$ 2,706.9M	.9239	$ 2,929.9M	66.30
Med.	739.8M	.4967	1,489.4M	33.70
			$ 4,419.3M	
1963				
High	$ 2,466.2M	.9239	$ 2,669.3M	66.88
Med.	656.5M	.4967	1,321.7M	33.12
			$ 3,991.0M	
1962				
High	$ 2,400.1M	.9239	$ 2,597.8M	69.99
Med.	553.3M	.4967	1,114.0M	30.01
			$ 3,711.8M	
1961				
High	$ 2,351.0M	.9239	$ 2,544.6M	70.45
Med.	530.1M	.4967	1,067.2M	29.55
			$ 3,611.8M	
1960				
High	$ 2,452.7M	.9239	$ 2,654.7M	70.21
Med.	559.5M	.4967	1,126.4M	29.79
			$ 3,781.1M	
1959				
High	$ 2,137.6M	.9239	$ 2,313.7M	67.95
Med.	542.0M	.4967	1,091.2M	32.05
			$ 3,404.9M	
1958				
High	$ 1,893.5M	.9239	$ 2,049.5M	68.73
Med.	463.2M	.4967	932.6M	31.27
			$ 2,982.1M	

Commercial: TCI

High and Medium Defense Volume

	Sample Commercial TCI	% Population	Estimated Population	Commercial TCI Weightings
1967				
High	$ 6,292.7M	.9239	$ 6,811.0M	63.36
Med.	1,956.0M	.4967	3,938.0M	36.64
			$10,749.0M	
1966				
High	$ 4,828.0M	.9239	$ 5,225.7M	63.97
Med.	1,462.2M	.4967	2,943.8M	36.03
			$ 8,169.5M	
1965				
High	$ 3,973.0M	.9239	$ 4,300.2M	61.98
Med.	1,310.0M	.4967	2,637.4M	38.02
			$ 6,937.6M	
1964				
High	$ 3,339.4M	.9239	$ 3,614.5M	61.48
Med.	1,124.9M	.4967	2,254.7M	38.52
			$ 5,879.2M	
1963				
High	$ 3,103.1M	.9239	$ 3,358.7M	62.57
Med.	997.8M	.4967	2,008.8M	37.43
			$ 5,367.5M	
1962				
High	$ 2,993.6M	.9239	$ 3,240.2M	67.01
Med.	792.4M	.4967	1,595.3M	32.99
			$ 4,835.5M	
1961				
High	$ 2,955.4M	.9239	$ 3,198.8M	69.25
Med.	705.5M	.4967	1,420.4M	30.75
			$ 4,619.2M	
1960				
High	$ 3,098.6M	.9239	$ 3,353.8M	69.30
Med.	737.9M	.4967	1,485.6M	30.70
			$ 4,839.4M	
1959				
High	$ 2,663.9M	.9239	$ 2,883.3M	66.19
Med.	731.4M	.4967	1,472.5M	33.81
			$ 4,355.8M	
1958				
High	$ 2,357.2M	.9239	$ 2,551.4M	66.12
Med.	649.3M	.4967	1,307.2M	33.88
			$ 3,858.6M	

SECTION IX

INDUSTRIAL COMPARISON GROUP (FTC-SEC) DATA

This section contains sample data for companies within the industrial comparison group[1] which were obtained from the FTC-SEC Reports on Manufacturing Corporations. Table IX-1 shows summary data of the six selected categories. The data for each industry category are presented in Tables IX-2 through IX-7,

The summary data in Table IX-1 were used in this study as comparable FTC-SEC data.

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[1]See Introduction for a discussion of the use of the Industrial Comparison Group (FTC-SE ').

COMPARATIVE INDUSTRY SAMPLE STATISTICS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Billions

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$111.8	120.1	107.6	121.4	127.0	128.9	145.1	155.0	167.0	191.5	220.1	230.4
ECI	$ 41.9	45.4	46.2	49.6	53.2	55.4	59.1	62.2	66.2	72.6	81.6	89.2
ECI Turnover	2.7	2.6	2.3	2.4	2.4	2.3	2.4	2.5	2.5	2.6	2.7	2.6
TCI	$ 48.6	53.1	54.1	57.8	62.1	65.2	70.0	73.4	77.9	86.0	97.9	110.4
TCI Turnover	2.3	2.3	2.0	2.1	2.0	2.0	2.1	2.1	2.1	2.2	2.2	2.1
Profit	$ 10.3	10.6	7.6	10.8	9.8	9.9	12.9	14.1	15.9	19.9	22.1	20.1
Profit/Sales (%)	9.2	8.8	7.1	8.9	7.8	7.7	8.9	9.1	9.5	10.4	10.0	8.7
Profit/ECI (%)	24.7	23.3	16.5	21.9	18.5	17.8	21.9	22.6	24.1	27.4	27.1	22.5
Profit/TCI (%)	21.3	20.0	14.1	18.8	15.9	15.1	18.5	19.2	20.4	23.1	22.6	18.2

Table IX-1

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

TRANSPORTATION EQUIPMENT	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$37,816	42,544	37,061	42,183	44,760	43,961	51,634	56,387	60,328	69,333	74,616	76,435
ECI	$12,853	13,767	14,336	15,332	16,483	17,223	18,633	20,190	21,508	23,459	25,267	27,447
ECI Turnover	2.9	3.1	2.6	2.8	2.7	2.6	2.8	2.8	2.8	2.95	2.95	2.8
TCI	$14,353	15,550	16,292	17,378	18,852	19,799	21,198	22,849	24,202	26,304	29,082	32,472
TCI Turnover	2.6	2.7	2.3	2.5	2.4	2.2	2.4	2.5	2.5	2.6	2.6	2.4
Profit	3,579	3,925	2,311	3,892	3,850	3,592	5,440	6,090	6,257	7,873	7,033	5,641
Profit/Sales (%)	9.46	9.22	6.24	9.09	8.60	8.17	10.54	10.80	10.37	11.36	9.42	7.38
Profit/ECI (%)	27.84	28.51	16.12	25.38	23.36	20.86	29.20	30.16	29.09	33.56	27.83	20.55
Profit/TCI (%)	24.94	25.24	14.18	22.4	20.42	18.14	25.66	26.65	25.85	29.93	24.18	17.37

Table IX-2

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

ELECTRICAL MACHINERY	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$19,630	21,280	21,241	26,532	28,904	29,634	32,558	34,577	36,160	40,521	49,267	52,464
ECI	6,665	7,441	8,093	9,734	11,135	11,650	12,485	13,185	13,720	14,874	16,863	18,866
ECI Turnover	2.9	2.9	2.6	2.7	2.6	2.5	2.6	2.6	2.6	2.7	2.9	2.8
TCI	$ 8,305	9,088	9,753	11,680	13,253	13,908	15,201	16,076	16,588	18,341	21,108	24,847
TCI Turnover	2.4	2.3	2.2	2.3	2.2	2.1	2.1	2.15	2.2	2.2	2.3	2.1
Profit	$ 1,538	1,820	1,638	2,371	2,065	2,088	2,464	2,568	2,889	3,563	4,415	4,216
Profit/Sales (%)	7.83	8.55	7.71	8.94	7.14	7.04	7.56	7.43	7.99	8.79	8.96	8.04
Profit/ECI (%)	23.08	24.46	20.24	24.36	18.54	17.92	19.73	19.48	21.06	23.95	26.18	22.35
Profit/TCI (%)	18.52	20.03	16.79	20.30	15.58	15.01	16.21	15.97	17.42	19.43	20.92	16.97

Table IX-3

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

OTHER MACHINERY	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$28,085	29,066	25,276	26,023	25,790	25,729	28,959	30,468	34,621	40,411	48,020	50,657
ECI	$12,222	13,496	13,429	13,163	13,282	13,816	14,762	14,964	16,478	18,385	21,425	22,996
ECI Turnover	2.3	2.2	1.9	2.0	1.9	1.7	2.0	2.0	2.1	2.2	2.2	2.2
TCI	$14,458	16,168	16,210	15,780	15,801	16,525	17,675	17,784	19,620	22,153	25,876	28,689
TCI Turnover	1.9	1.8	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.85	1.8
Profit	$ 3,062	2,831	1.978	2,502	2,078	2,163	2,623	2,891	3,858	4,652	5,601	5,339
Profit/Sales (%)	10.90	9.74	7.82	9.61	8.39	8.41	9.06	9.49	11.14	11.51	11.66	10.54
Profit/ECI (%)	25.05	20.98	14.73	19.01	16.28	14.65	17.77	19.32	23.41	25.30	26.14	23.22
Profit/TCI (%)	21.18	17.51	12.20	15.86	13.69	13.09	14.84	16.26	19.66	21.00	21.64	18.61

Table IX-4

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

OTHER FABRI-CATED METAL	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$16,078	16,860	15,560	17,014	16,991	17,938	19,380	20,790	22,645	25,391	28,684	29,452
ECI	$ 6,185	6,652	6,505	7,005	7,351	7,449	7,819	8,204	8,431	8,895	9,923	10,645
ECI Turnover	2.6	2.5	2.4	2.4	2.3	2.4	2.5	2.5	2.7	2.9	2.9	2.8
TCI	$ 6,995	7,634	7,561	8,091	8,647	8,796	9,217	9,743	10,077	10,706	12,087	13,225
TCI Turnover	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.4	2.4	2.2
Profit	$ 1,252	1,212	957	1,106	868	971	1,213	1,322	1,552	2,012	2,443	2,332
Profit/Sales (%)	7.79	7.19	6.15	6.50	5.11	5.41	6.26	6.36	6.85	7.92	8.52	7.92
Profit/ECI (%)	20.24	18.22	14.71	15.79	11.81	13.04	15.51	16.11	18.41	22.62	24.62	21.91
Profit/TCI (%)	17.9	15.88	12.66	13.67	10.04	11.04	13.16	13.57	15.40	18.79	20.21	17.63

Table IX-5

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

INSTRUMENTS	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$ 4,141	4,398	4,336	4,817	5,317	5,660	6,229	6,489	6,918	9,001	11,287	12,534
ECI	$ 2,017	2,157	2,257	2,487	2,825	3,022	3,114	3,274	3,587	4,585	5,322	6,394
ECI Turnover	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.1	2.0
TCI	$ 2,299	2,462	2,569	2,797	3,212	3,421	3,540	3,782	4,198	5,288	6,217	7,443
TCI Turnover	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.7	1.6	1.7	1.8	1.7
Profit	$ 502	509	476	629	625	617	739	777	928	1,419	1,961	1,944
Profit/Sales (%)	12.12	11.57	10.98	13.06	11.75	10.90	11.86	11.97	13.41	15.76	17.37	15.51
Profit/ECI (%)	24.89	23.60	21.09	25.29	22.12	20.42	23.73	23.73	25.87	30.95	36.85	30.40
Profit/TCI (%)	21.84	20.67	18.53	22.49	19.46	18.04	20.88	20.54	22.10	26.83	31.54	26.12

Table IX-6

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPINGS

(FTC-SEC QUARTERLY FINANCIAL REPORT)

$ in Millions

MISCELLANEOUS MANUFACTURING	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Sales	$ 6,017	5,977	5,249	4,818	5,220	5,975	6,234	6,318	6,360	6,882	8,188	8,876
ECI	$ 1,909	1,920	1,796	1,838	2.075	2,241	2,296	2,411	2,447	2,441	2,756	2,854
ECI Turnover	3.2	3.1	2.9	2.6	2.5	2.7	2.7	2.6	2.6	2.8	3.0	3.1
TCI	$ 2,200	2,235	2,075	2,115	2,347	2,785	2,967	3,175	3,247	3,257	3,577	3,730
TCI Turnover	2.7	2.7	2.5	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.3	2.4
Profit	404	308	288	347	361	448	448	424	440	477	654	642
Profit/Sales (%)	6.71	5.15	5.49	7.20	6.92	7.50	7.19	6.71	6.92	6.93	7.99	7.23
Profit/ECI (%)	21.16	16.04	16.04	18.8[illegible]	17.40	19.99	19.51	17.59	17.98	19.54	23.73	22.49
Profit/TCI (%)	18.36	13.78	13.88	16.41	15.38	16.09	15.10	13.35	13.55	14.64	18.28	17.21

Table IX-7

UNCLASSIFIED
Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) Logistics Management Institute 4701 Sangamore Road Washington, D.C. 20016	2a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
	2b. GROUP

3. REPORT TITLE

Defense Industry Profit Review

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

5. AUTHOR(S) (Last name, first name, initial)

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
March 1969	177	43

8a. CONTRACT OR GRANT NO. SD-271	9a. ORIGINATOR'S REPORT NUMBER(S) 69-1
b. PROJECT NO. SD-271-93	
c.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	

10. AVAILABILITY/LIMITATION NOTICES

Distribution of this report is unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
	OSD (I&L)

13. ABSTRACT

This study summarizes data on realized profits of major defense contractors for the 10-year period 1958 through 1967. Profit ratios are presented by size of company and by type of contract. Profit trends on defense business and commercial business are compared.

DD FORM 1 JAN 64 1473

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