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DEFENSE INDUSTRY PROFIT REVIEW: VOLUME II

Logistics Management Institute
Washington, D.C.

November 1967

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DEFENSE INDUSTRY PROFIT REVIEW

LMI Task 66-25

Volume Two

November, 1967

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LOGISTICS MANAGEMENT INSTITUTE
4900 Massachusetts Avenue, N.W.
Washington, D. C. 20016

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LOGISTICS MANAGEMENT INSTITUTE
4900 Massachusetts Avenue, N.W.
Washington, D.C. 20016

Foreword - Volume Two

This document encompasses the supporting data of the Defense Industry Profit Review, and supplements Volume One, which concentrates primarily on findings and conclusions resulting from this study.

SECTION IX

CONTRACTOR SELECTION AND DATA COLLECTION

A. GENERAL

The purpose of this section is to describe the methods used for selection of the sample companies and to describe the data collected from those companies. The validity of the data and of the resulting statistics are also examined.

No single source for the data required to perform a comparative analysis of defense and commercial profits exists. FTC/SEC data are in the form of composites of company sales and profits. Defense Department data are in the form of contract award amounts and negotiated target profits. Renegotiation Board data are in the form of total business subject to renegotiation. Therefore, the only sources of comparative data are the companies themselves. The voluntary nature of the company submissions and the difficulty of correlating data from the varied sources imposed practical limitations on the data collection and analysis.

B. SELECTION OF THE COMPANIES IN THE SAMPLE

The definition of the population from which the sample companies were selected included the following criteria:

- 1) At least 10% of total company business in defense sales.
- 2) At least \$1 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

Approximately 200 companies were identified which were believed to meet the criteria. A few companies volunteered to be included in the study. In an effort to limit the amount of data to be handled in the study the list of companies solicited was reduced to 110. This smaller list was obtained by eliminating some of the smaller companies on a random basis.

Of the companies solicited for sales and profit data, very few refused to respond. A larger number were unable to supply the data in the form required and within the time allowed.

When the solicitation responses were in, the actual company data showed that the selection criteria were not met in two cases. In another case the company data arrived too late to be included. In still another case the company in question merged with another in the list in 1965, leaving a total useful data sample of 65 companies prior to 1965 with 64 companies thereafter.

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

²Standard Listed Stock Report of the Standard & Poor's Corp.

If we examine the characteristics of the list, broken into defense sales ranges we find:

<u>Category</u>	<u>FY65 Annual Defense Sales</u>	<u>Original Number¹</u>	<u>Reduced Number</u>	<u>Solicit. Responses</u>	<u>Useful Number</u>
High Volume	\$200M or more	29	29	25	23
Medium Volume	\$ 25M to \$200M	55	28	17	17
Low Volume	\$ 1M to \$ 25M	<u>116</u>	<u>53</u>	<u>26</u>	<u>25</u> ²
		200	110	68	65 ²

To examine possible bias in the sample, Renegotiation Board profit data for 12 of the non-responding companies (with permission of these companies) were obtained and reviewed. The review indicated no profit bias in the sample. That is, it indicated that defense profitability of high and medium companies in the sample was representative of profitability of other high and medium companies in the population. Insufficient data were available to make this determination for the low volume companies.

The low volume sample is not a random sample. First because the total population could not be enumerated, 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. Aside from this possible bias, it will be shown later that the confidence intervals for the low volume

¹The total numbers of companies in these sales ranges is now believed to be: high volume 27 and medium volume 55. No data are available from DoD to estimate the total number of companies having from \$1M to \$25M of annual defense sales, but it is believed that it is large enough to permit the assumption of an infinite population in the statistical analysis.

²One less company in 1965 and 1966.

companies are large, due to the small sample size as related to the total population; and to the large variances in the data. Therefore, conclusions were drawn only from the high and medium volume company data. Nevertheless, the low volume data are presented in the report.

C DATA OBTAINED

Data were collected from each of the companies in the sample. Approval of the Bureau of the Budget for this data collection was obtained.¹ The form used for requesting these data is given in the Appendix A. Companies used the same annual period that they use in their reports to stockholders. The definitions of the individual data items used corresponded to those given in Regulation SX of the Securities and Exchange Commission. (Rules shown as references in the list of the data are references to rules of this regulation.) Definitions are:

1. Total Sales. Annual sales for the entire company operation ending in the given year (Rule 5-03, Caption 1A.)

a. Defense Sales. Total annual sales of prime contracts and subcontracts of the Department of Defense, and the following breakdown of defense sales.

(1) Prime contracts

(2) Subcontracts

b. Total annual prime and subcontract sales to other federal government agencies.

c. Total annual sales to commercial customers, state and local governments of the U.S. and sales to foreign governments. (This was equal to Total Sales less 1a. and 1b.)

¹Bureau of the Budget letter dated 18 April 1966 to OSD.

2. Equity Capital Investment. Total dollars at the end of the given year which were assigned to capital shares and surplus (Rule 5-03, Captions 34 and 35).

3. Defense Equity Capital Investment. Pro rata dollar share of item 2 for Department of Defense contract operations.

4. Total Capital Investment. Equity Capital Investment plus long-term debt. (Rule 5-02, Captions 28, 29, and 30.)

5. Defense Total Capital Investment. Defense Equity Capital Investment plus pro rata dollar share of long-term debt for Department of Defense contract operations.

6. Total Profits. Net income or loss before provision for federal taxes on income and before reduction of profits as a result of renegotiation. (Reductions of profits as a result of renegotiation were added to the sum derived from Rule 5-04, Caption 14.)

a. Defense Profits. Net income or loss in prime contracts and subcontracts of the Department of Defense before any reduction of profit as a result of renegotiation. The net income or loss is stated after deduction of all disallowed or nonrecoverable costs under DoD cost principles. (The latter deductions were requested as item 7.) The following breakdown of net profit and loss was also requested:

(1) Prime contracts

(2) Subcontracts

b. Net income or loss on prime contracts and subcontracts of other federal government agencies.

c. Net income or loss in commercial business, business with state and local governments of the U.S., and business with foreign governments. (This was equal to total profits less 2a. and 2b.)

7. Unallowable/nonrecoverable costs. Total costs which were not allowable under DoD cost principles but which were applicable to DoD prime contracts and subcontracts.

Some companies were not able to furnish all of the data requested. For example:

- (1) Sixty-three companies were able to submit data by type of contract.
- (2) Fifty companies were able to accurately break prime from subcontract sales.
- (3) All 65 companies submitted commercial data, but 3 of them included commercial sales of only the defense divisions.
- (4) Fifty-one companies furnished price competitive information.
- (5) Forty-seven companies submitted unallowable/nonrecoverable cost information.

D. INDUSTRIAL COMPARISON GROUP

Since it was desired to compare the profits of the defense sample with comparable industrial categories, a selection was made of durable goods industrial groupings from the FTC/SEC Reports on Manufacturing Corporations. These are:

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

This grouping includes data of 3500 companies out of the 175,000 filing quarterly financial reports with the Federal Trade Commission and Securities and Exchange Commission. (The companies included in the defense sample are also in the group, with one exception in the medium volume defense group.)

The industrial data¹ are believed appropriate because:

1. The data are comparable with that requested from the companies solicited.
2. Data are available on a quarterly basis within three months after the end of a measured period.
3. Information is compiled by industry group and assets size.

¹See Section XIII for the FTC/SEC data.

SECTION X

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 percentages 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 labeled "Defense" are broken down into high, medium, and low volume categories, based on company defense sales volume. Data labeled "Commercial" are divided into high, medium, and low volume breakdown based on company commercial 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, by inspection.

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. Confidence intervals for the averages 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 68% confidence interval extends from x to y, we can say, "There is a 68% chance that the actual average of the population category is between x and y." Hence this type of confidence interval tells us to what degree we can believe the sample average to be a measure of the true average.

4. Ranges

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), 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. ESTIMATING POPULATION SIZE

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

X-4, etc.) and G (Tables X-32, X-34, etc.) show commercial averages of these same companies, using the same underlying data, but with the companies grouped on the basis of their commercial sales volume (see par. D.1. above).

2. 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.

F. WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

Profit/Sales	Total Population	Tables X-1 & 2 Charts X-1, 2 & 3
Profit/Sales	High & Medium Volume Categories	Tables X-3 & 4 Charts X-4, 5 & 6
Profit/Sales	High Volume Category	Tables X-5 & 6 Charts X-7, 8 & 9
Profit/Sales	Medium Volume Category	Tables X-7 & 8 Charts X-10, 11 & 12
Profit/Sales	Low Volume Category	Tables X-9 & 10 Charts X-13, 14 & 15
Profit/ECI	Total Population	Tables X-11 & 12
Profit/ECI	High & Medium Volume Categories	Tables X-13 & 14
Profit/ECI	High Volume Category	Tables X-15 & 16
Profit/ECI	Medium Volume Category	Tables X-17 & 18
Profit/ECI	Low Volume Category	Tables X-19 & 20
Profit/TCI	Total Population	Tables X-21 & 22
Profit/TCI	High & Medium Volume Categories	Tables X-23 & 24
Profit/TCI	High Volume Category	Tables X-25 & 26
Profit/TCI	Medium Volume Category	Tables X-27 & 28
Profit/TCI	Low Volume Category	Tables X-29 & 30

G. WEIGHTED AVERAGES AND RANGE DATA

Profit/Sales	Total Population	Tables X-31 & 32 Chart X-16
Profit/Sales	High & Medium Volume Categories	Tables X-33 & 34 Chart X-17
Profit/Sales	High Volume Category	Tables X-35 & 36 Chart X-18
Profit/Sales	Medium Volume Category	Tables X-37 & 38 Chart X-19
Profit/Sales	Low Volume Category	Tables X-39 & 40 Chart X-20
Profit/ECI	Total Population	Tables X-41 & 42
Profit/ECI	High & Medium Volume Categories	Tables X-43 & 44
Profit/ECI	High Volume Category	Tables X-45 & 46
Profit/ECI	Medium Volume Category	Tables X-47 & 48
Profit/ECI	Low Volume Category	Tables X-49 & 50
Profit/TCI	Total Population	Tables X-51 & 52
Profit/TCI	High & Medium Volume Categories	Tables X-53 & 54
Profit/TCI	High Volume Category	Tables X-55 & 56
Profit/TCI	Medium Volume Category	Tables X-57 & 58
Profit/TCI	Low Volume Category	Tables X-59 & 60

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Total Population

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

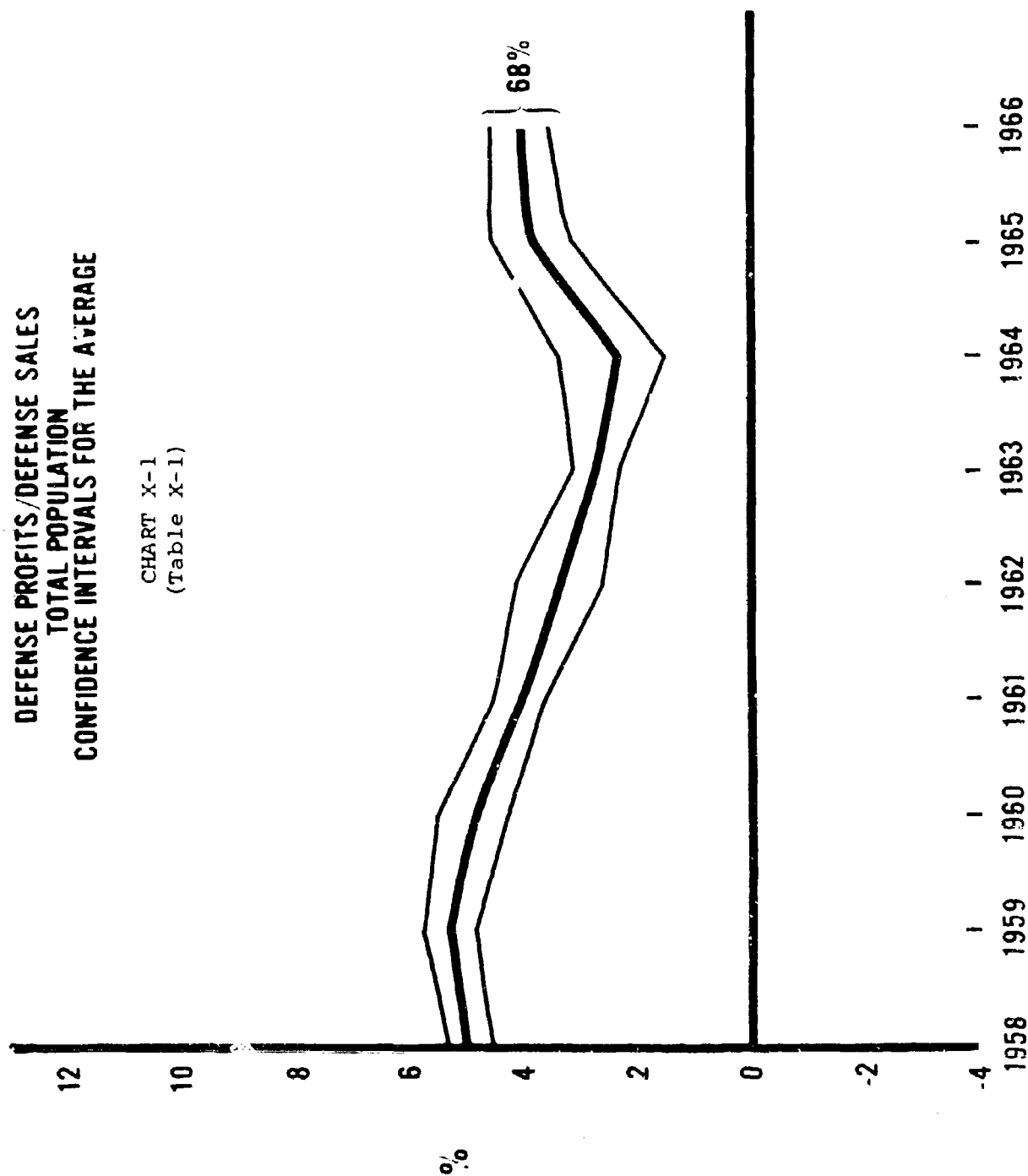
²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-1

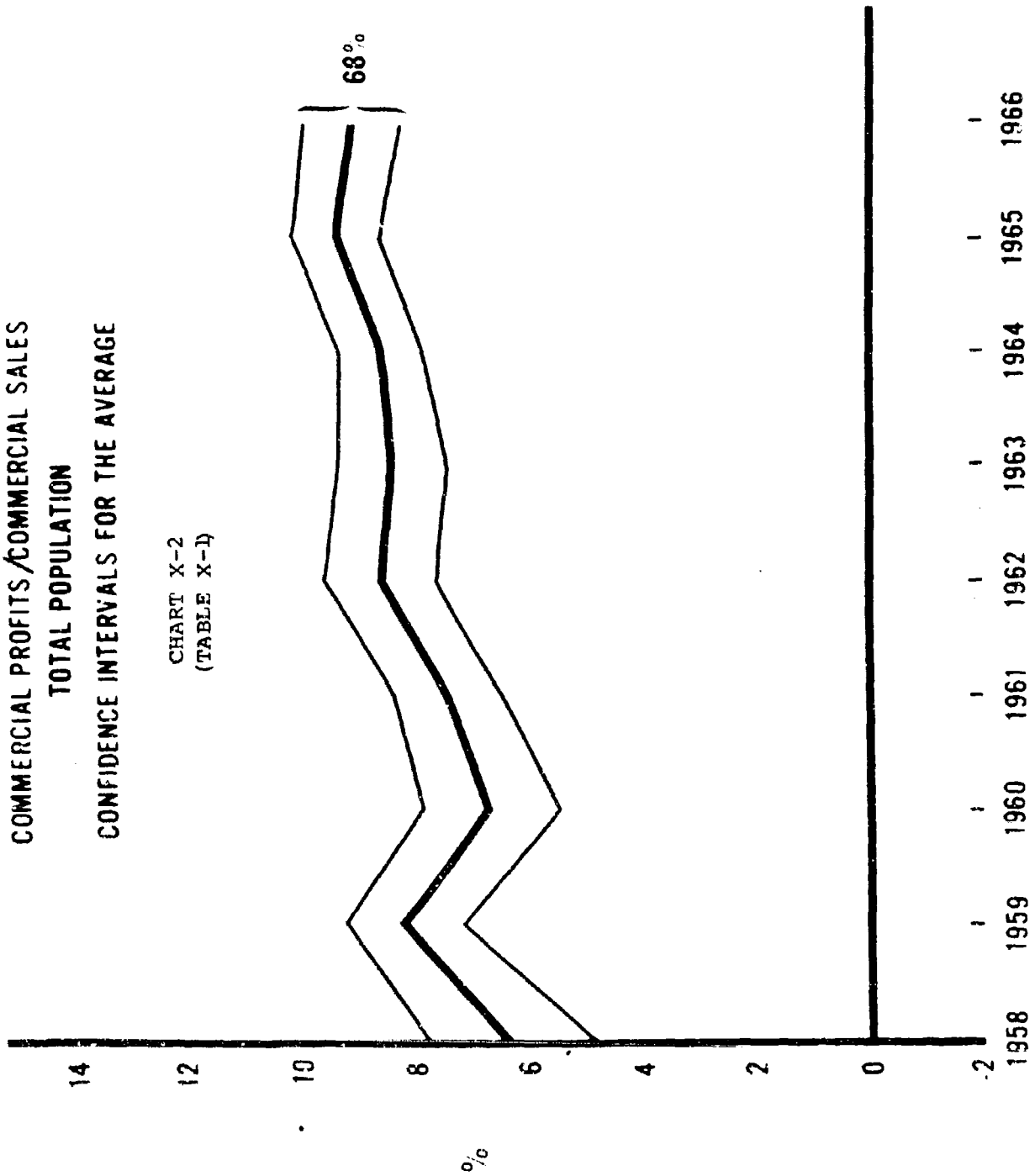
**DEFENSE PROFITS/DEFENSE SALES
TOTAL POPULATION
CONFIDENCE INTERVALS FOR THE AVERAGE**

CHART X-1
(Table X-1)



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

CHART X-2
(TABLE X-1)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Total Population
COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(0.21)	(5.62) - 5.20	(9.11) - 8.69
1959	5.91	4.50 - 7.32	3.58 - 8.24
1960	2.97	1.21 - 4.73	0.07 - 5.87
1961	5.82	4.65 - 6.99	3.90 - 7.74
1962	7.93	6.78 - 9.08	6.03 - 9.83
1963	7.65	6.51 - 8.79	5.77 - 9.53
1964	8.95	8.03 - 9.89	7.43 - 10.49
1965	8.55	7.60 - 9.50	6.99 - 10.11
1966	8.72	7.25 - 10.19	6.30 - 11.14
1967			

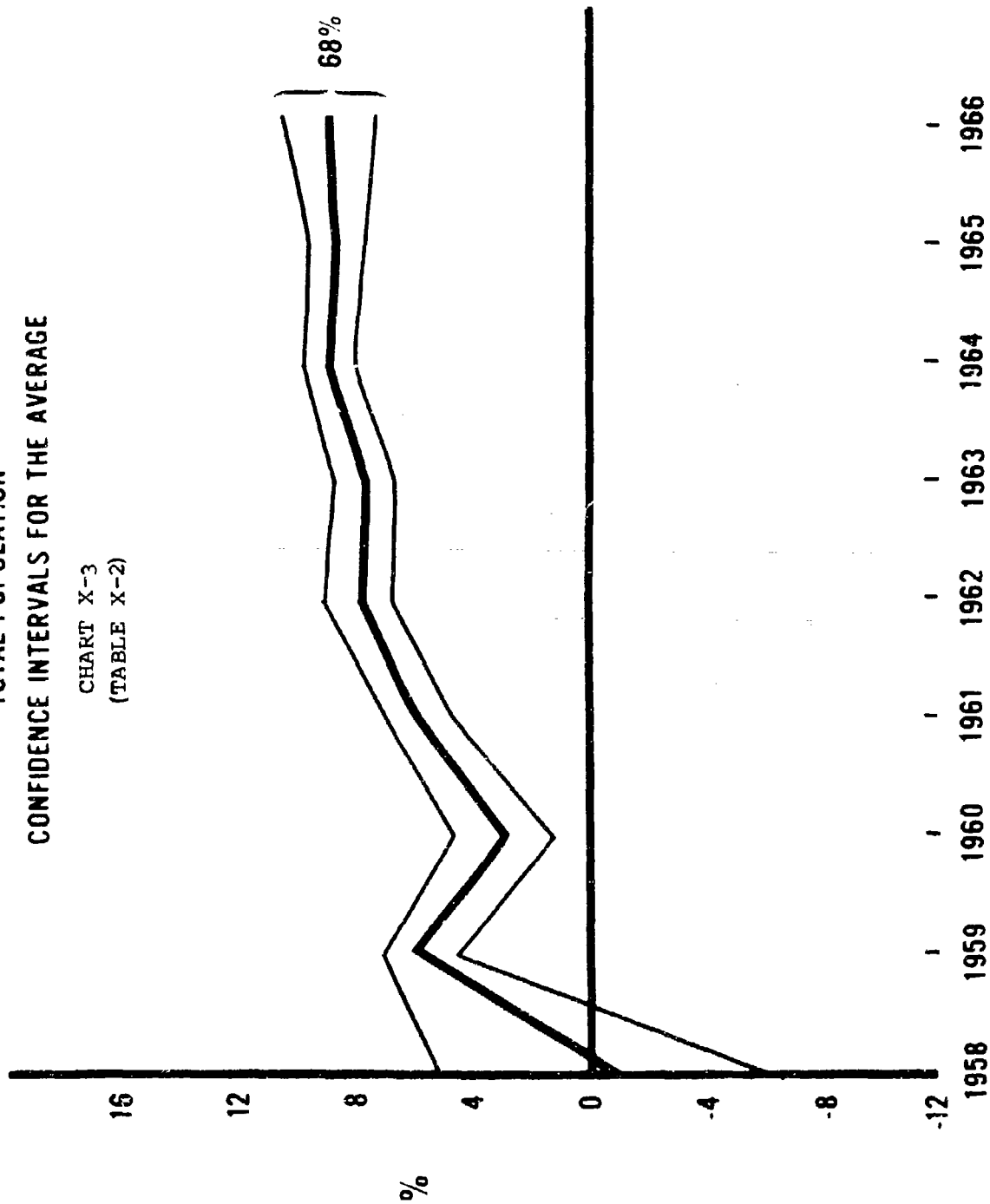
¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

Table X-2

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

CHART X-3
(TABLE X-2)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

High and Medium Volume Categories

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

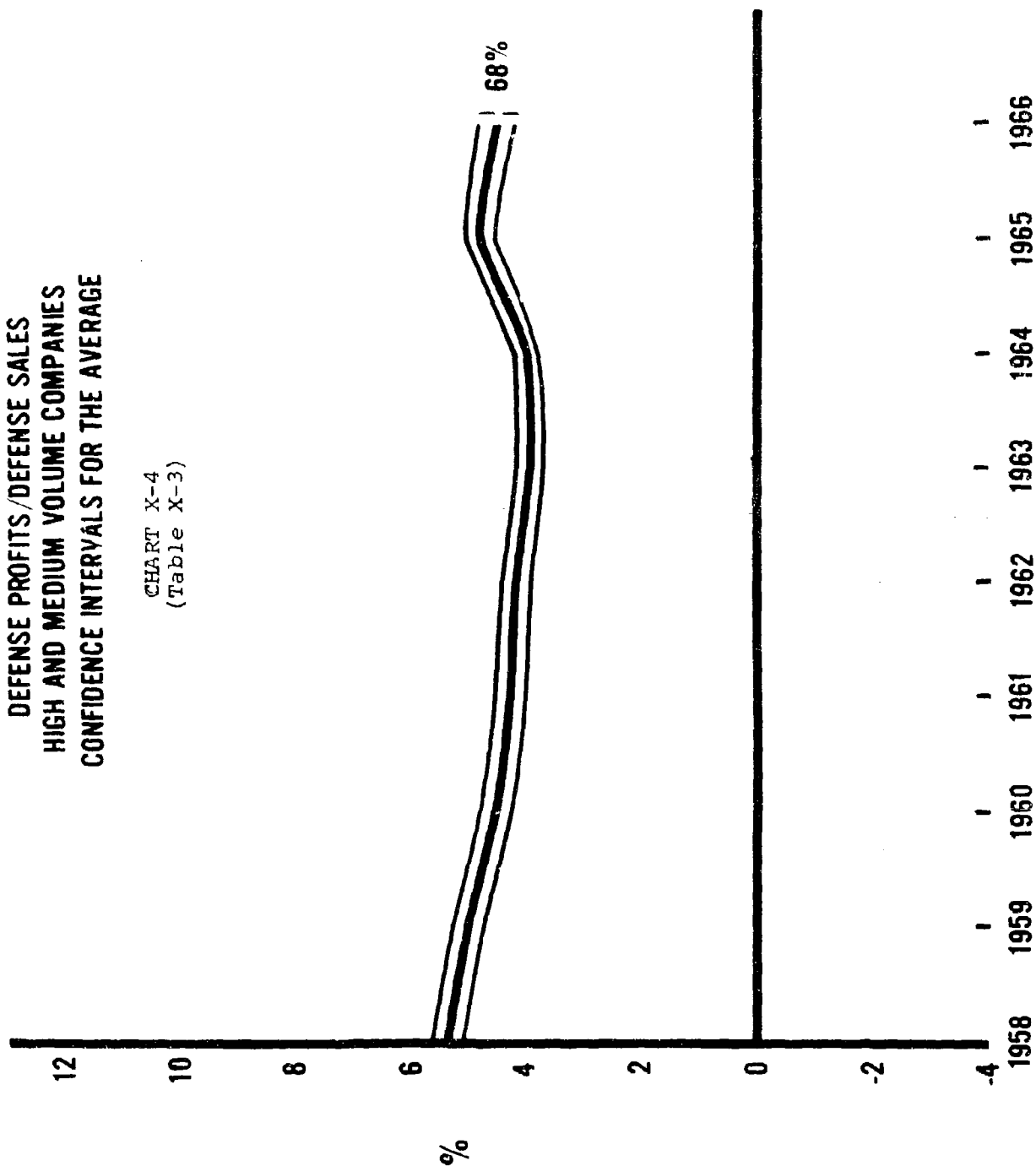
¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

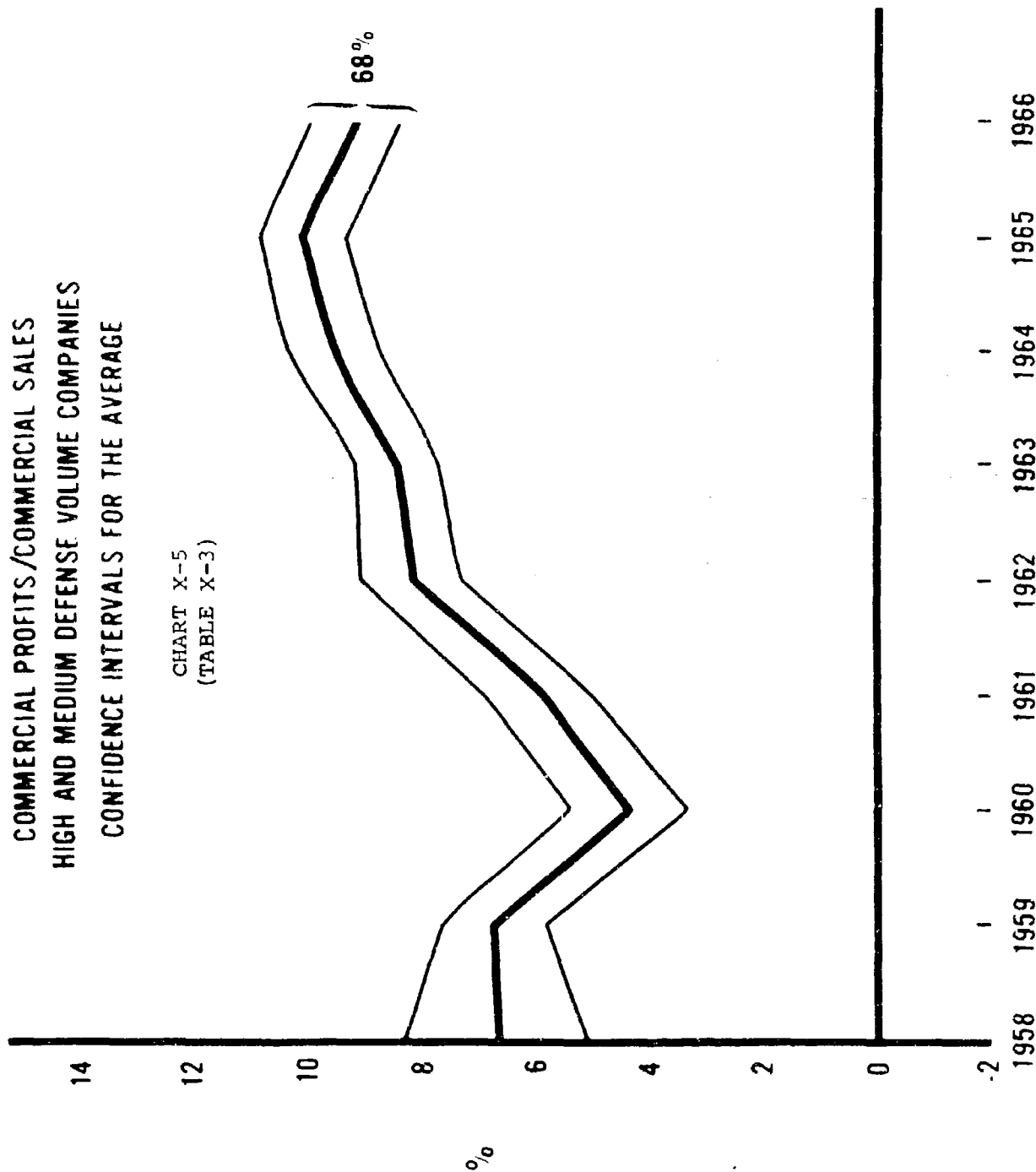
DEFENSE PROFITS/DEFENSE SALES HIGH AND MEDIUM VOLUME COMPANIES CONFIDENCE INTERVALS FOR THE AVERAGE

CHART X-4
(Table X-3)



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

CHART X-5
(TABLE X-3)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

High and Medium Volume Categories

COMMERCIAL¹

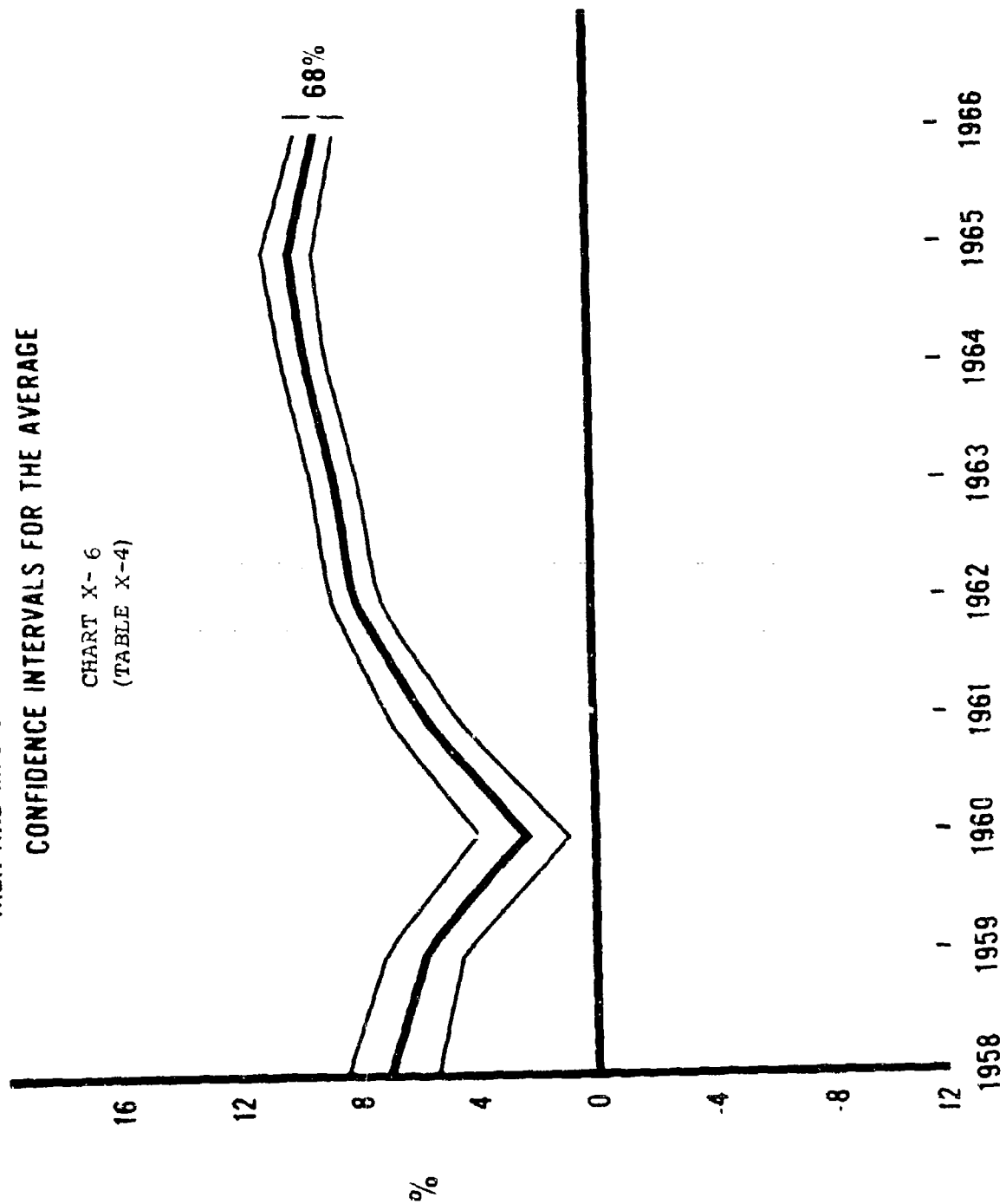
Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	6.71	5.23 - 8.19	4.28 - 9.14
1959	5.71	4.35 - 7.07	3.47 - 7.95
1960	2.48	0.88 - 4.08	(0.16) - 5.12
1961	5.53	4.58 - 6.48	3.96 - 7.10
1962	8.03	7.30 - 8.76	6.83 - 9.23
1963	8.62	7.92 - 9.32	7.46 - 9.78
1964	9.54	8.86 - 10.22	8.42 - 10.66
1965	10.05	9.34 - 10.76	8.88 - 11.22
1966	9.08	8.26 - 9.90	7.72 - 10.44
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

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

CHART X-6
(TABLE X-4)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

High Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

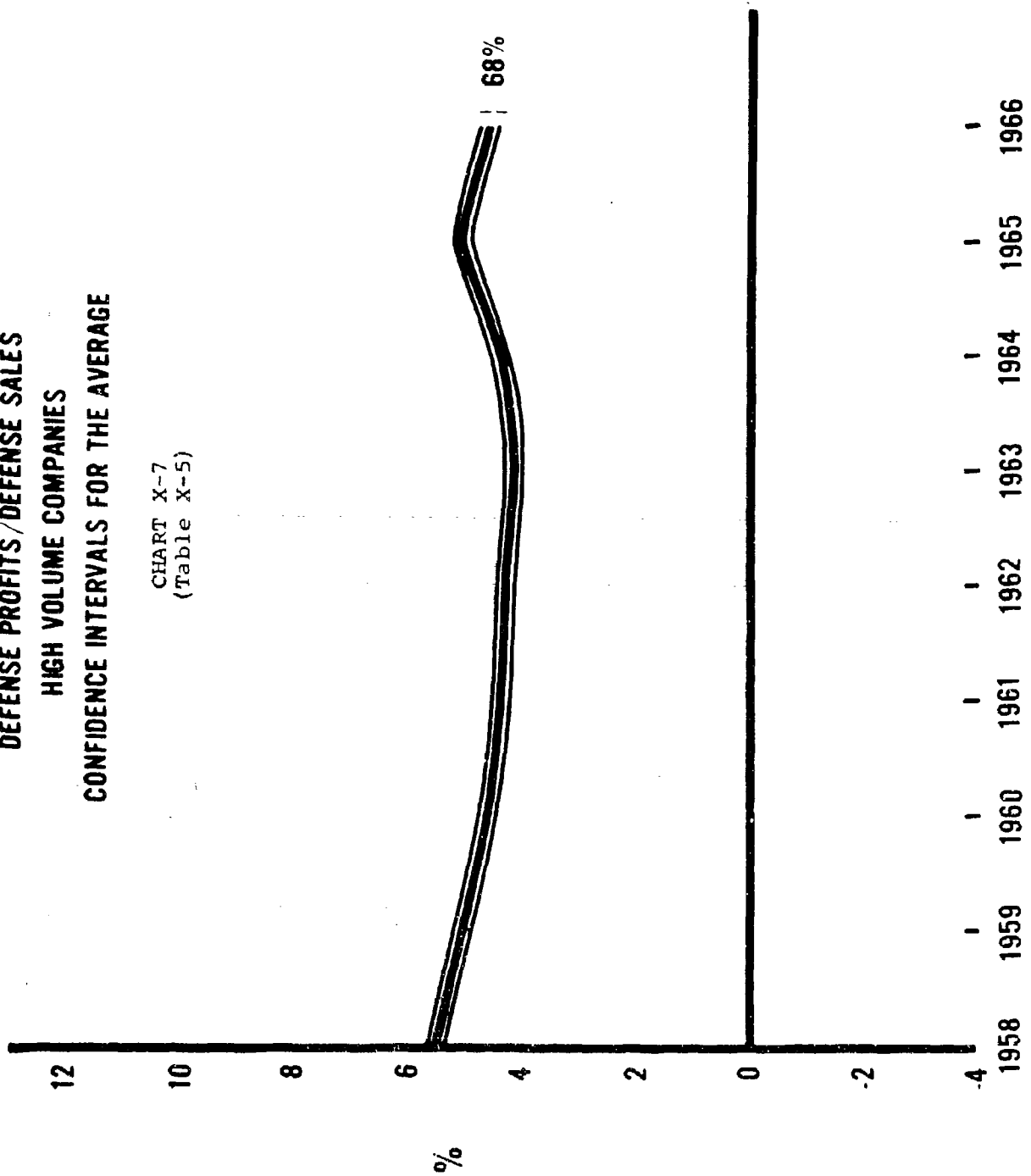
¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

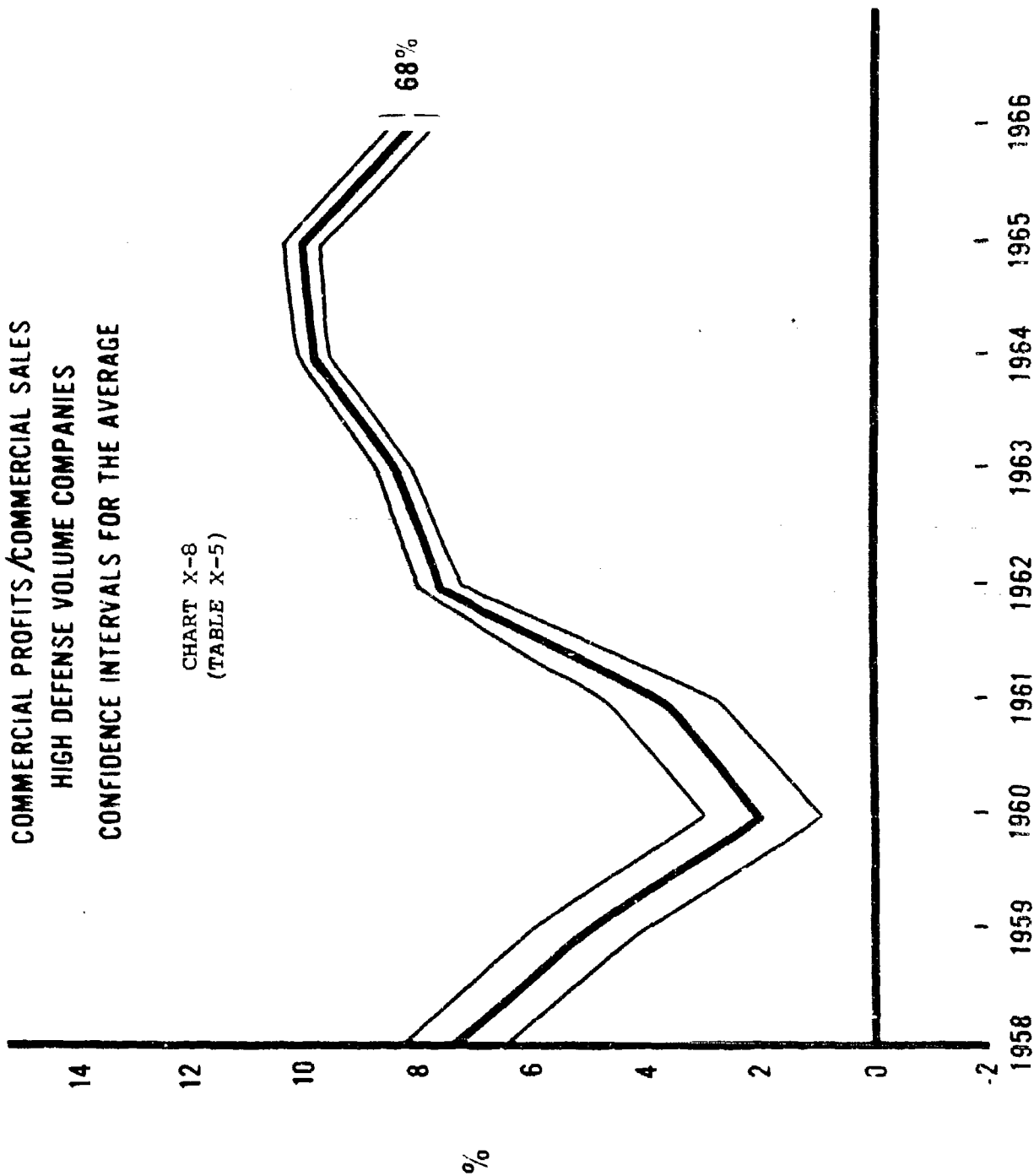
DEFENSE PROFITS/DEFENSE SALES HIGH VOLUME COMPANIES CONFIDENCE INTERVALS FOR THE AVERAGE

CHART X-7
(Table X-5)



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

CHART X-8
(TABLE X-5)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

High Volume Category

COMMERCIAL¹

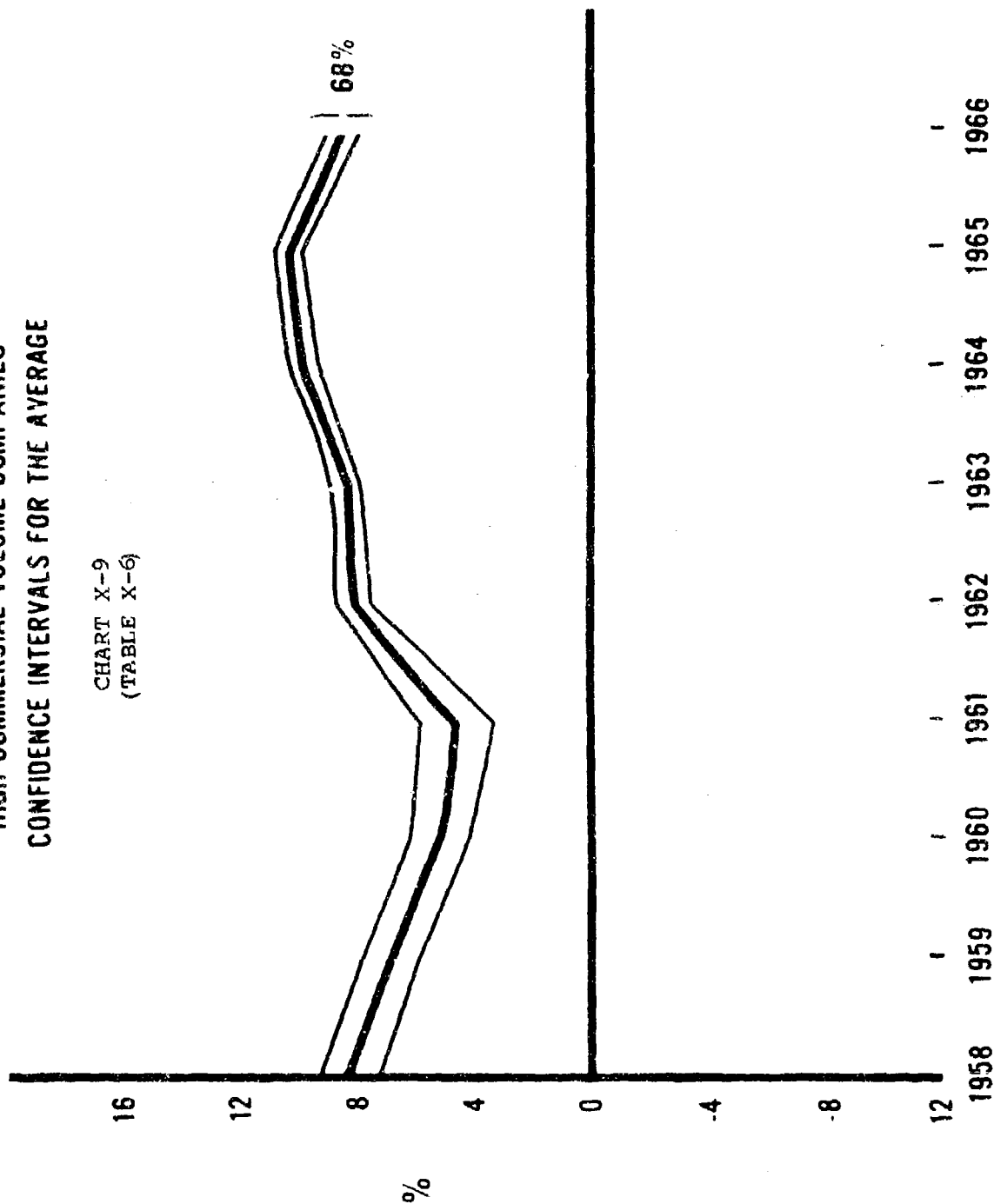
Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	8.10	7.18 - 9.02	6.59 - 9.61
1959	6.91	5.86 - 7.96	5.19 - 8.63
1960	5.23	4.17 - 6.29	3.49 - 6.97
1961	4.65	3.39 - 5.91	2.58 - 6.72
1962	8.01	7.57 - 8.45	7.28 - 8.74
1963	8.19	7.83 - 8.55	7.60 - 8.78
1964	9.77	9.44 - 10.10	9.22 - 10.32
1965	10.24	10.01 - 10.47	9.86 - 10.62
1966	8.47	7.99 - 8.95	7.69 - 9.25
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

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

CHART X-9
(TABLE X-6)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Medium Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

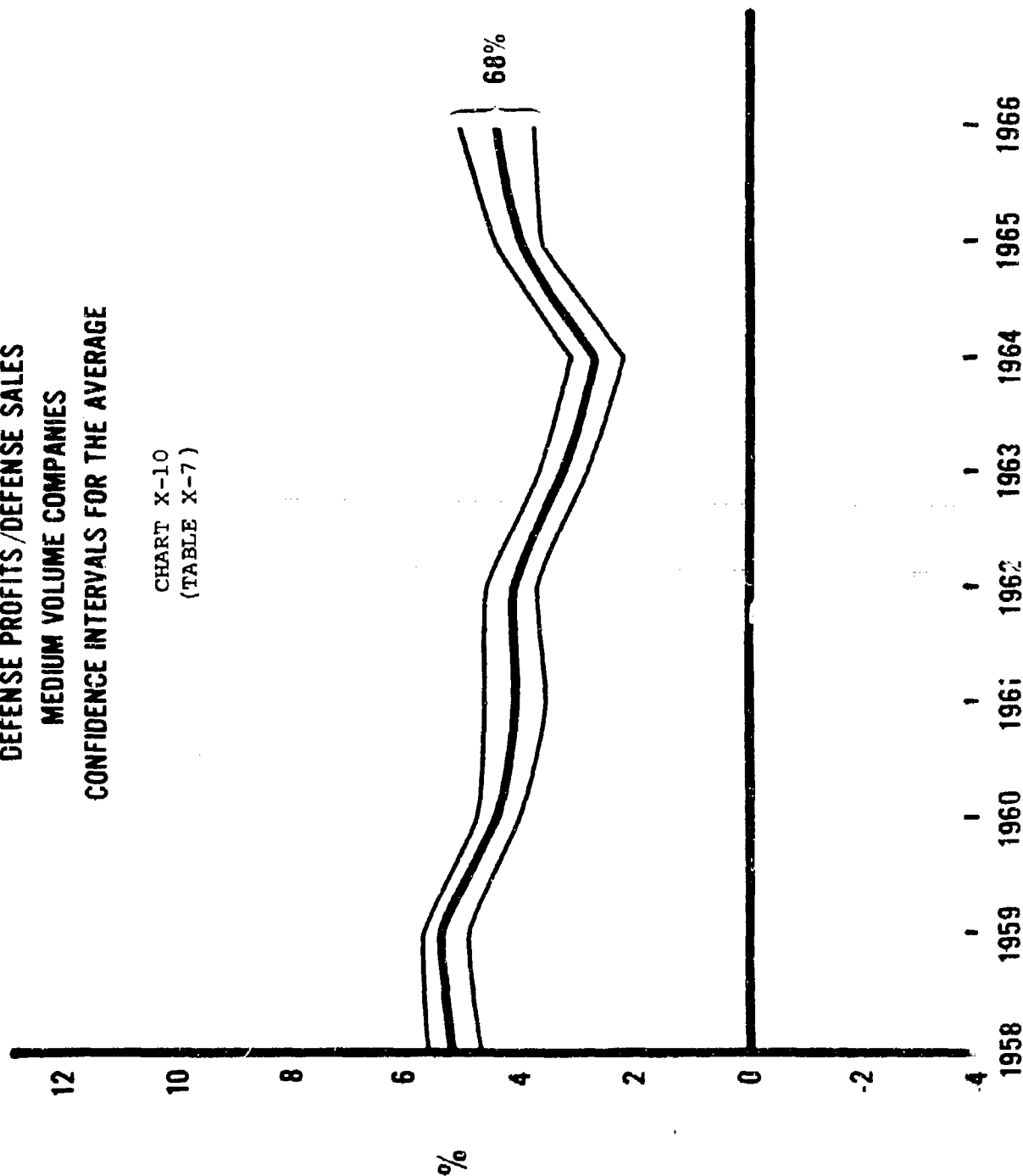
²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-7

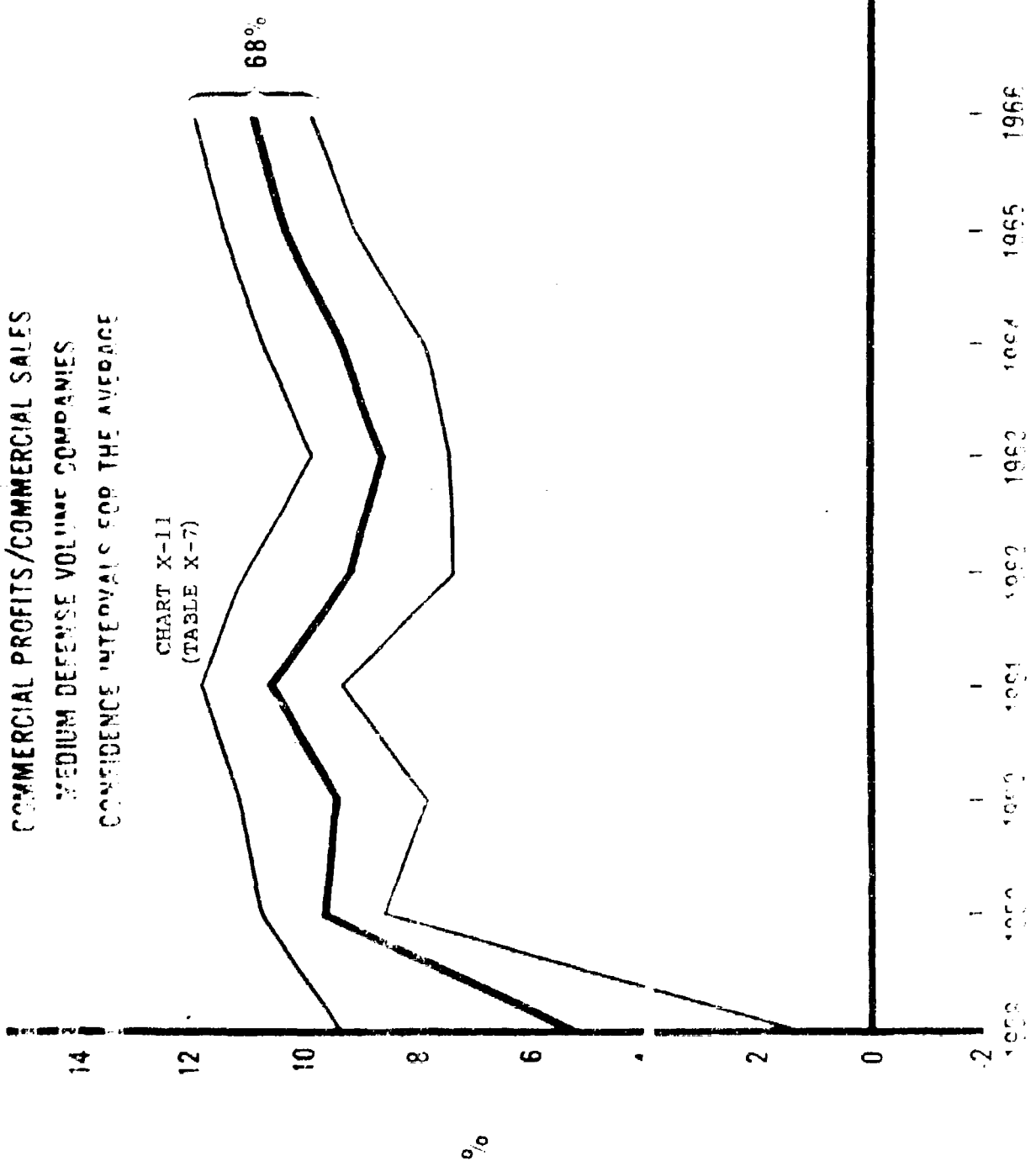
**DEFENSE PROFITS/DEFENSE SALES
MEDIUM VOLUME COMPANIES
CONFIDENCE INTERVALS FOR THE AVERAGE**

CHART X-10
(TABLE X-7)



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

CHART X-11
(TABLE X-7)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Medium Volume Category

COMMERCIAL¹

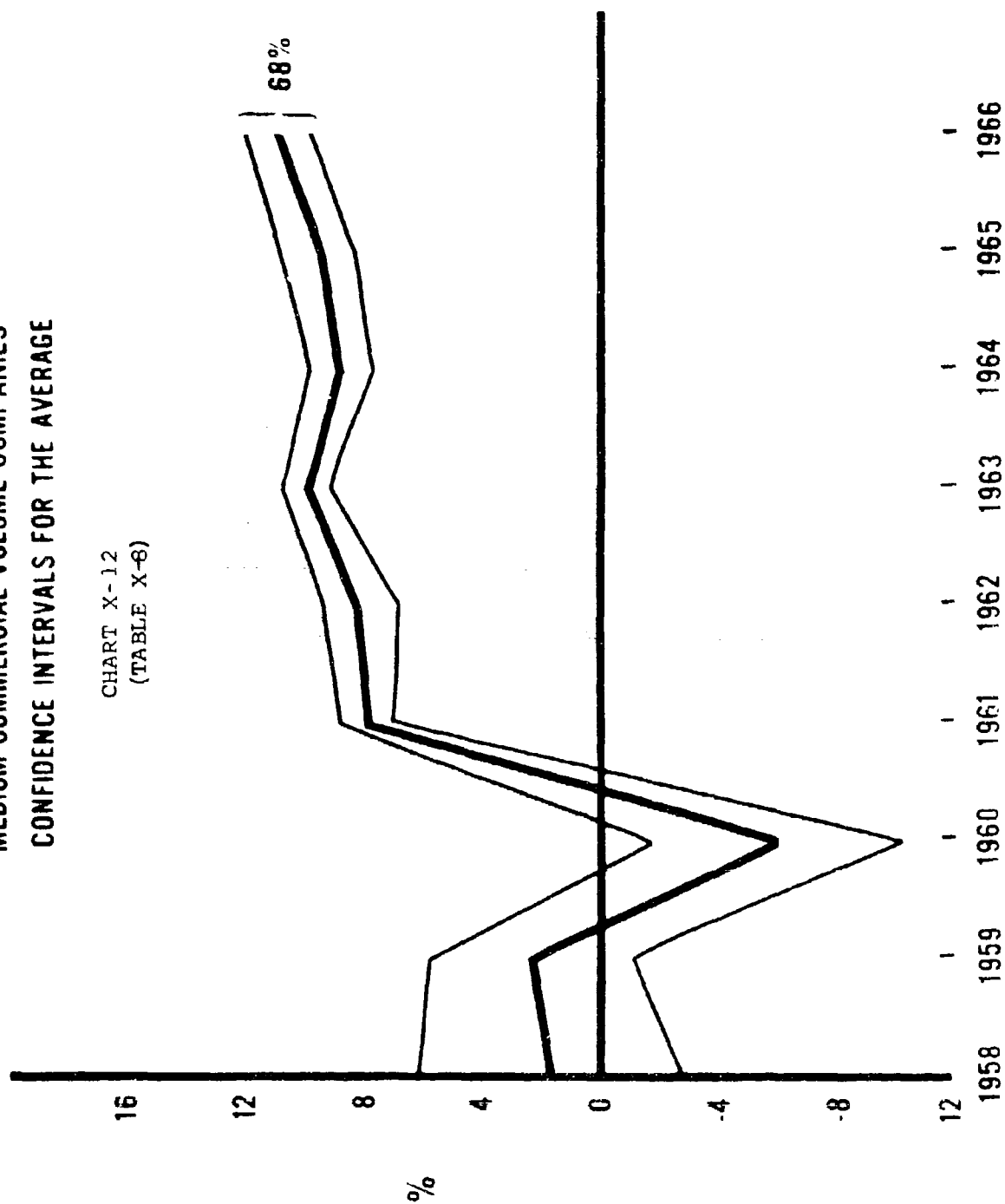
Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	1.63	(2.74) - 6.00	(5.56) - 8.82
1959	2.32	(1.09) - 5.73	(3.29) - 7.93
1960	(6.10)	(10.32) - (1.88)	(13.05) - 0.85
1961	7.98	7.08 - 8.88	6.50 - 9.46
1962	8.10	6.89 - 9.31	6.11 - 10.09
1963	9.89	9.04 - 10.74	8.50 - 11.28
1964	8.76	7.60 - 9.92	6.85 - 10.67
1965	9.43	8.26 - 10.60	7.50 - 11.36
1966	10.92	9.74 - 12.10	8.98 - 12.86
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

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

CHART X-12
(TABLE X-8)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Low Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

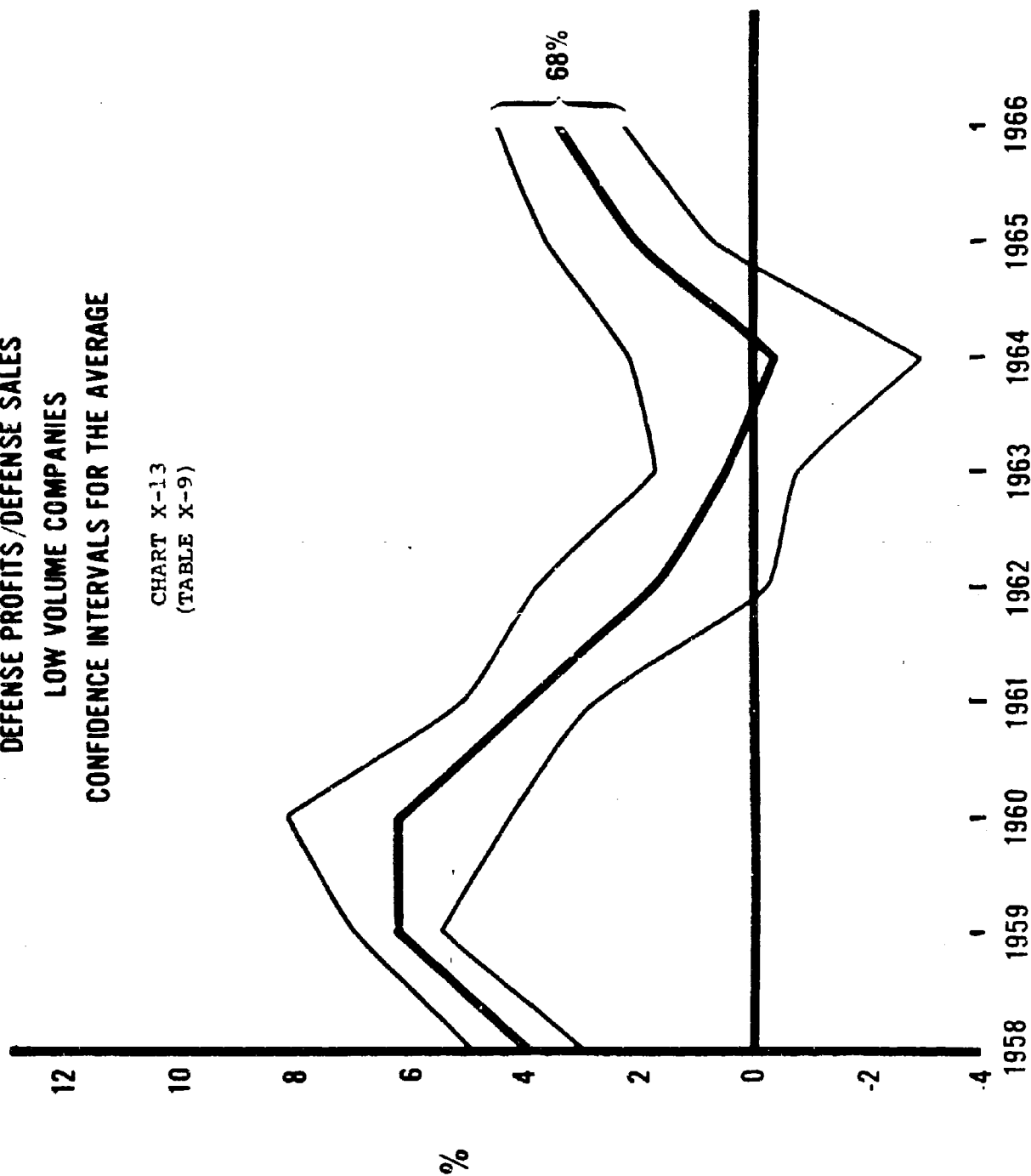
²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-9

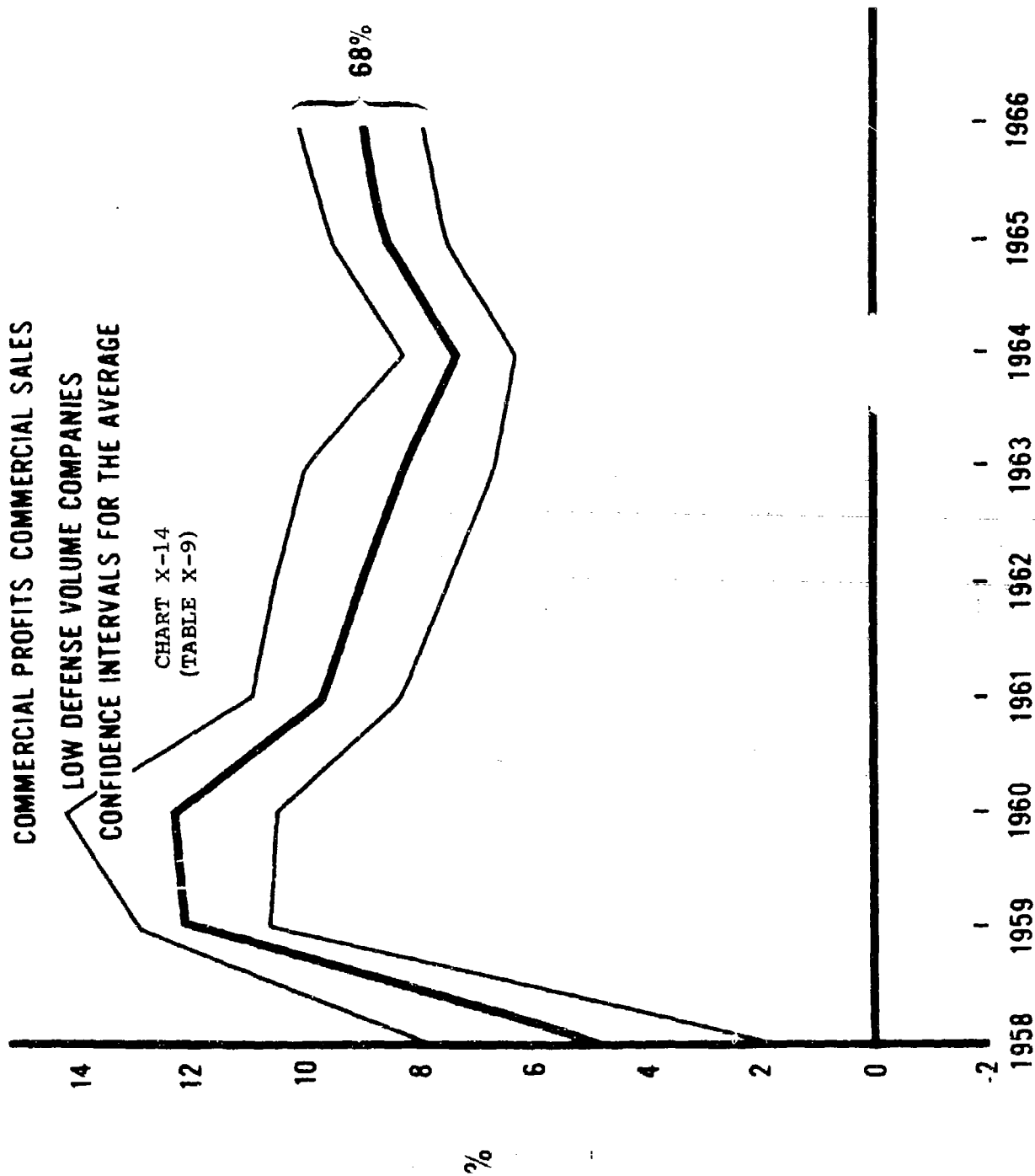
DEFENSE PROFITS/DEFENSE SALES LOW VOLUME COMPANIES CONFIDENCE INTERVALS FOR THE AVERAGE

CHART X-13
(TABLE X-9)



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

CHART X-14
(TABLE X-9)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/SALES

Low Volume Category

COMMERCIAL¹

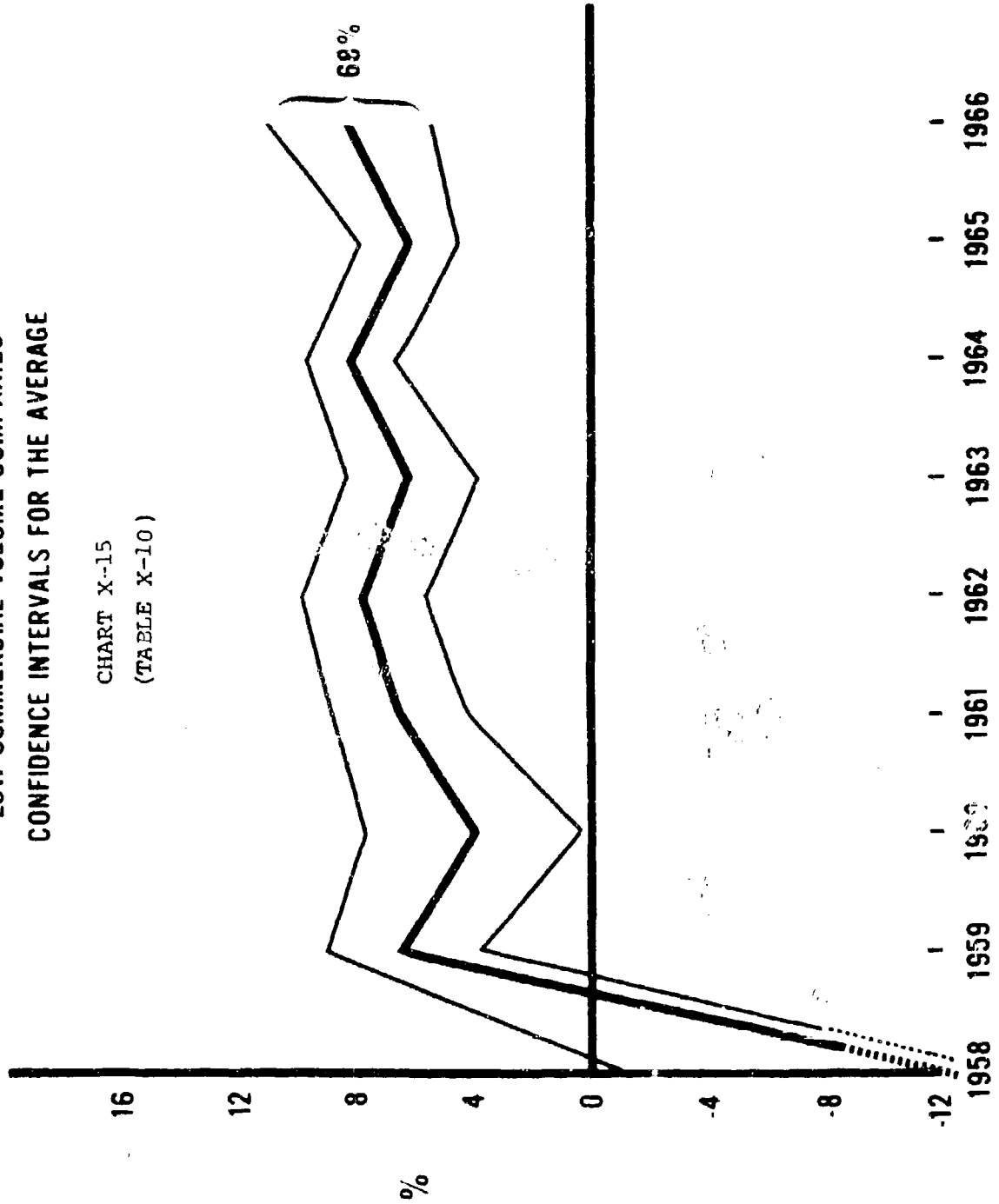
Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(14.25)	(27.61) - (0.89)	(36.22) - 7.72
1959	6.27	3.61 - 8.93	1.90 - 10.64
1960	3.95	0.33 - 7.57	(2.00) - 9.90
1961	6.46	4.11 - 8.81	2.60 - 10.32
1962	7.75	5.55 - 9.95	4.13 - 11.37
1963	6.07	3.82 - 8.32	2.36 - 9.78
1964	8.06	6.55 - 9.57	5.57 - 10.55
1965	6.22	4.51 - 7.93	3.41 - 9.03
1966	8.21	5.42 - 11.00	3.61 - 12.81
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

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

CHART X-15
(TABLE X-10)



WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Total Population

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Total Population

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(0.58)	(24.01) - 22.85	(39.12) - 37.96
1959	17.57	12.34 - 22.80	8.96 - 26.18
1960	8.22	1.39 - 16.25	(3.41) - 21.05
1961	16.19	10.70 - 21.68	7.15 - 25.23
1962	23.25	19.35 - 27.15	16.84 - 29.66
1963	21.22	17.47 - 24.97	15.06 - 27.38
1964	23.30	20.14 - 26.46	18.11 - 28.49
1965	22.05	19.28 - 24.82	17.49 - 26.61
1966	26.42	21.41 - 31.43	18.17 - 34.67
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-12

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

High and Medium Volume Categories

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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	13.46	17.29 - 19.63	16.54 - 20.38	16.84	11.82 - 21.86	8.58 - 25.10
1962	18.33	17.26 - 19.40	16.58 - 20.08	23.53	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-13

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

High and Medium Volume Categories

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	18.04	13.31 - 22.77	10.27 - 25.81
1959	15.63	11.32 - 19.94	8.55 - 22.71
1960	7.04	(1.35) - 15.43	(6.76) - 20.84
1961	16.15	10.21 - 22.09	6.38 - 25.92
1962	24.06	21.24 - 26.88	19.41 - 28.71
1963	24.40	21.50 - 27.30	19.62 - 29.18
1964	27.72	25.01 - 30.43	23.26 - 32.18
1965	28.98	26.44 - 31.52	24.80 - 33.16
1966	27.67	24.38 - 30.96	22.25 - 33.09
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

High Volume Category

DEFENSE¹

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	68% Conf. Int.	90% Conf. Int.
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	18.33	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 - 28.72
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-15

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

High Volume Category

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	19.31	16.19 - 22.43	14.18 - 24.44
1959	16.42	3.23 - 19.61	11.17 - 21.67
1960	13.14	9.57 - 16.71	7.27 - 19.01
1961	12.26	3.72 - 20.80	(1.79) - 26.31
1962	21.27	19.95 - 22.59	19.11 - 23.43
1963	20.92	19.79 - 22.05	19.06 - 22.78
1964	26.40	25.14 - 27.66	24.33 - 28.47
1965	28.12	27.04 - 29.20	26.34 - 29.90
1966	23.78	21.80 - 25.76	20.53 - 27.03
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-16

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Medium Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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 - 32.53	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-17

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Medium Volume Category

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	8.25	(10.46) - 26.96	(22.52) - 39.02
1959	11.15	(3.02) - 25.32	(12.17) - 34.47
1960	(29.79)	(60.78) - 1.20	(80.76) - 21.18
1961	33.57	27.36 - 39.78	23.35 - 43.79
1962	36.89	30.57 - 43.21	26.49 - 47.29
1963	40.94	34.60 - 47.28	30.51 - 51.37
1964	34.46	27.90 - 41.02	23.68 - 45.24
1965	32.65	27.29 - 38.01	23.83 - 41.47
1966	44.58	38.19 - 50.97	34.07 - 55.09
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-18

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Low Volume Category

COMMERCIAL¹

DEFENSE

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-19

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/ECI

Low Volume Category
COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(45.09)	(107.08) - 16.90	(147.07) - 56.89
1959	22.07	10.76 - 33.38	3.46 - 40.68
1960	12.77	(1.45) - 26.99	(10.62) - 36.16
1961	16.27	6.22 - 26.32	(0.27) - 32.81
1962	21.97	14.58 - 29.36	9.82 - 34.12
1963	16.32	9.14 - 23.50	4.50 - 28.14
1964	18.05	12.75 - 23.35	9.33 - 26.77
1965	13.81	9.15 - 18.47	6.14 - 21.48
1966	24.72	15.27 - 34.17	9.18 - 40.26
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Total Population

COMMERCIAL¹

DEFENSE

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-21

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Total Population
COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(0.45)	(21.18) - 20.28	(34.55) - 33.65
1959	14.18	9.90 - 18.46	7.13 - 21.23
1960	7.12	0.93 - 13.31	(3.06) - 17.30
1961	13.25	9.77 - 16.73	7.52 - 18.98
1962	19.01	15.69 - 22.33	13.55 - 24.47
1963	16.98	13.92 - 20.04	11.94 - 22.02
1964	18.84	16.21 - 21.47	14.52 - 23.16
1965	17.66	15.39 - 19.93	13.92 - 21.40
1966	20.38	16.10 - 24.66	13.35 - 27.41
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

High and Medium Volume Categories

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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	19.71 - 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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

High and Medium Volume Categories

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	14.02	10.24 - 17.80	7.81 - 20.23
1959	12.29	8.83 - 15.75	6.60 - 17.98
1960	5.53	(0.90) - 11.96	(5.05) - 16.11
1961	12.66	9.34 - 15.98	7.21 - 18.11
1962	18.76	16.46 - 21.06	14.98 - 22.54
1963	18.63	16.26 - 21.00	14.73 - 22.53
1964	21.47	19.25 - 23.69	17.81 - 25.13
1965	22.05	20.04 - 24.06	18.74 - 25.36
1966	20.21	17.79 - 22.63	16.23 - 24.19
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-24

WE TPD AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

High Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	68% Conf. Int.	90% Conf. Int.
1958	21.80	21.15 - 22.45	20.72 - 22.88	14.48	12.08 - 16.98	10.53 - 19.43
1959	19.85	19.18 - 20.52	18.74 - 20.96	10.11	7.81 - 12.41	6.33 - 13.82
1960	18.81	18.16 - 19.46	17.74 - 19.88	4.10	1.03 - 7.17	(0.95) - 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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-25

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

High Volume Category

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	15.23	12.80 - 17.66	11.23 - 19.23
1959	13.02	10.63 - 15.41	9.08 - 16.96
1960	10.35	7.81 - 12.89	6.17 - 14.53
1961	9.64	5.52 - 13.76	2.86 - 16.42
1962	16.56	15.56 - 17.56	14.92 - 18.20
1963	15.86	14.97 - 16.75	14.40 - 17.32
1964	20.23	19.36 - 21.10	18.30 - 21.66
1965	21.37	20.55 - 22.19	20.02 - 22.72
1966	17.24	15.94 - 18.54	15.10 - 19.38
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-26

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT, TCI

Medium Volume Category

COMMERCIAL¹

DEFENSE

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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 - 25.76
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-27

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Medium Volume Category

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	5.75	(8.52) - 20.02	(17.73) - 29.23
1959	8.35	(3.01) - 19.71	(10.34) - 27.04
1960	(22.46)	(45.91) - 0.93	(61.03) - 16.11
1961	25.98	20.81 - 31.15	17.47 - 34.49
1962	28.94	12.53 - 34.35	20.04 - 37.84
1963	32.37	26.80 - 37.94	23.21 - 41.53
1964	28.23	22.44 - 34.02	18.70 - 37.76
1965	24.97	20.51 - 29.43	17.63 - 32.31
1966	33.67	28.81 - 38.53	25.68 - 41.66
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-28

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Low Volume Category

COMMERCIAL¹

DEFENSE

Year	Average ²	68% Conf. Int.	90% Conf. Int.	Average ³	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	17.15	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-29

WEIGHTED AVERAGES AND CONFIDENCE INTERVALS

PROFIT/TCI

Low Volume Category

COMMERCIAL¹

Year	Average ²	68% Confidence Intervals	90% Confidence Intervals
1958	(39.57)	(96.97) - 17.83	(133.99) - 54.85
1959	19.00	9.44 - 28.56	3.28 - 34.72
1960	11.10	(1.73) - 23.93	(10.01) - 32.21
1961	14.48	7.64 - 21.32	3.23 - 25.73
1962	19.48	12.92 - 26.04	8.68 - 30.28
1963	14.09	8.04 - 20.14	4.14 - 24.04
1964	15.41	10.90 - 19.92	7.99 - 22.83
1965	11.79	7.84 - 15.74	5.29 - 18.21
1966	20.66	12.09 - 29.23	6.57 - 34.75
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-30

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Total Population

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-31

DEFENSE PROFITS/DEFENSE SALES
TOTAL POPULATION
DISTRIBUTIONS OF THE RATIO
68%

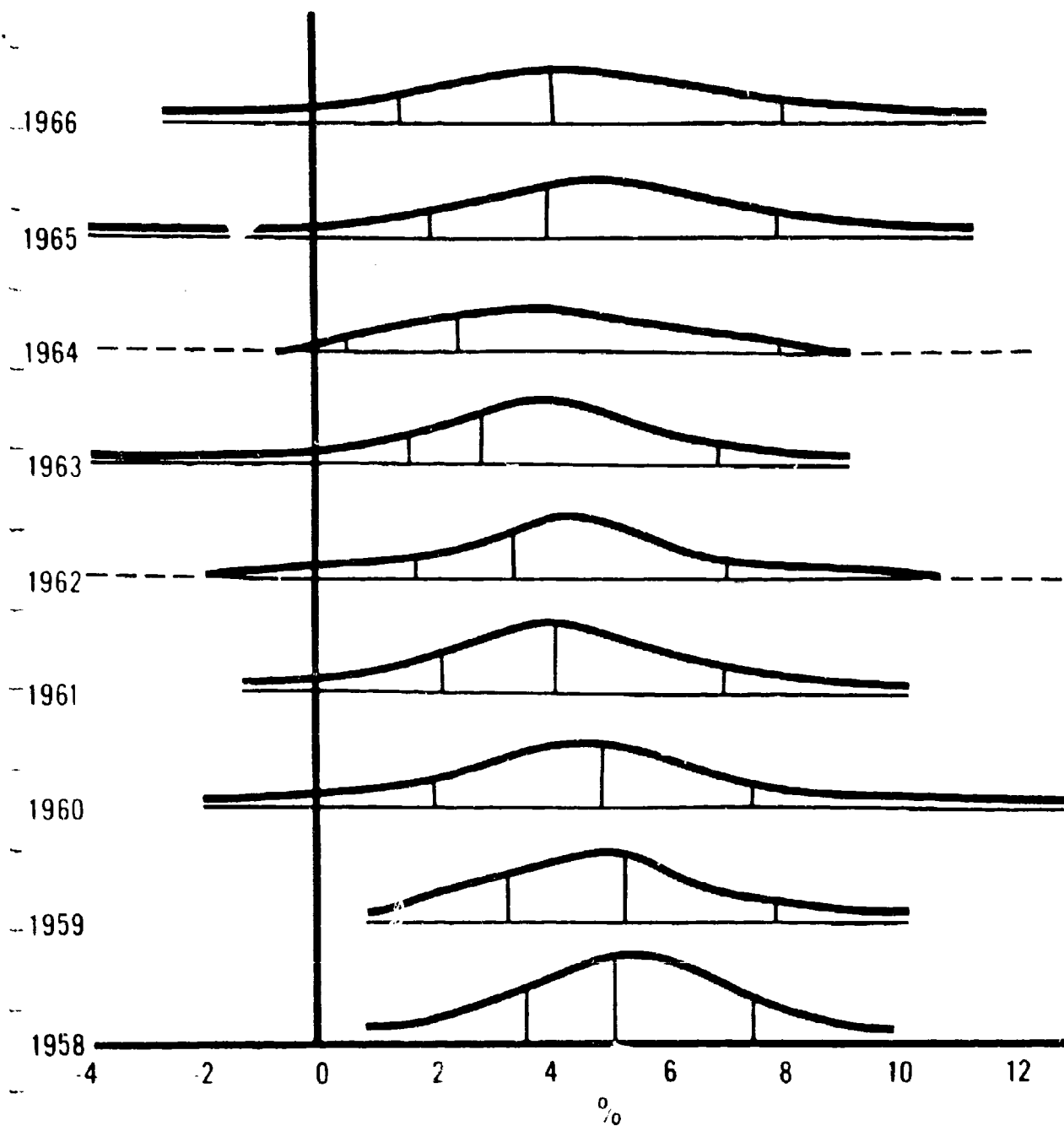


CHART X-16
(TABLE X-31)

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALFS

Total Population

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(0.21)	(15.30) - 31.00	(79.60) - 58.20
1959	5.91	(7.40) - 22.00	(17.60) - 31.30
1960	2.97	(12.90) - 21.60	(25.60) - 33.50
1961	5.82	(6.70) - 20.00	(18.30) - 30.20
1962	7.93	0.20 - 16.30	(6.50) - 23.70
1963	7.65	1.60 - 15.70	(7.50) - 22.40
1964	8.96	3.60 - 15.90	(1.80) - 20.60
1965	8.55	4.70 - 16.00	(4.20) - 19.80
1966	8.72	(0.40) - 18.70	(10.70) - 28.60
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

Table X-32

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

High and Medium Volume Categories

DEFENSE ¹COMMERCIAL

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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) - 13.80
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-33

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

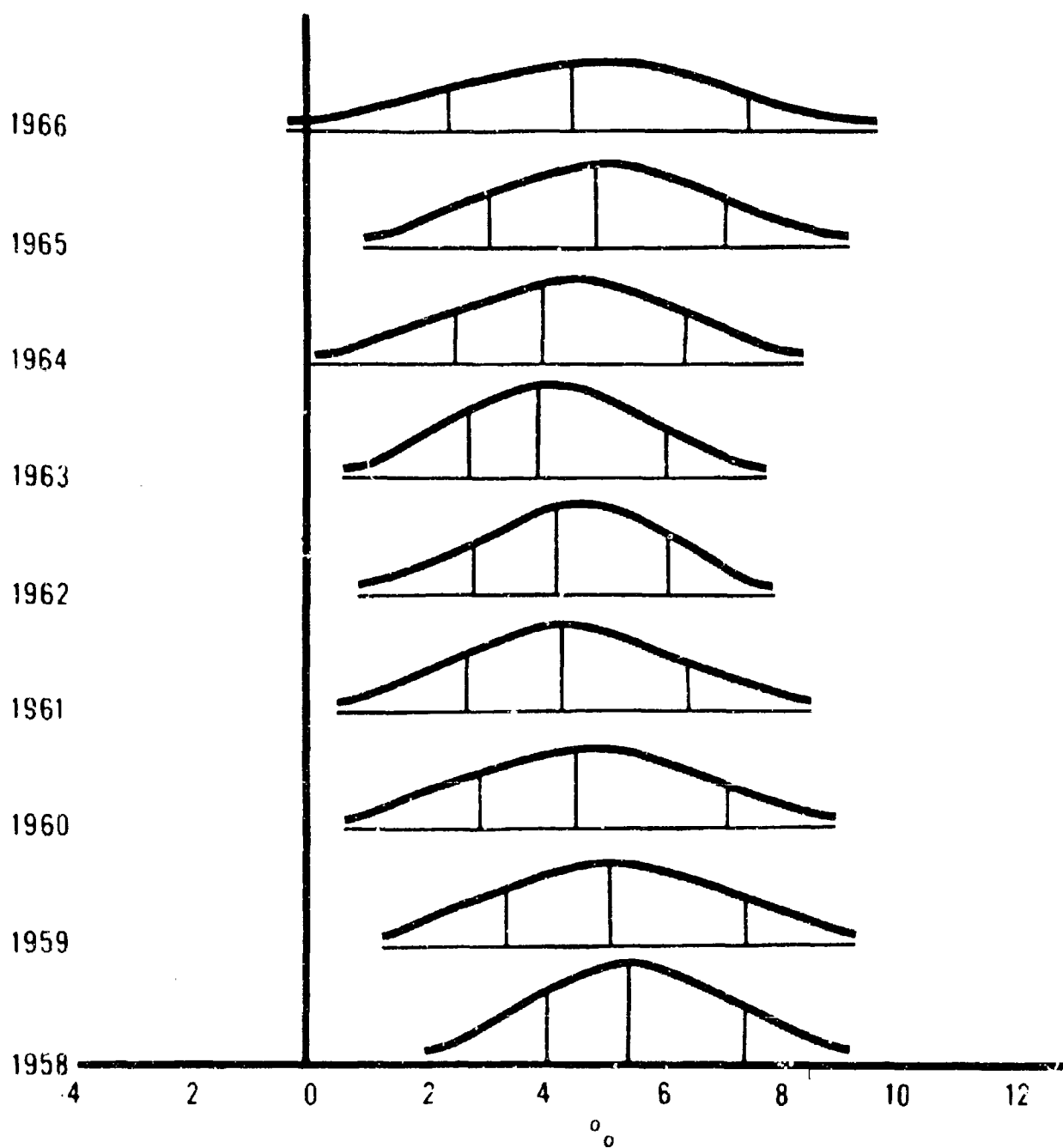


CHART X-17
(TABLE X-33)

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

High and Medium Volume Categories

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	6.71	(5.50) - 22.30	(16.90) - 31.30
1959	5.71	(8.20) - 21.70	(18.50) - 31.40
1960	2.48	(11.10) - 21.20	(24.40) - 31.00
1961	5.53	(7.20) - 19.70	(20.70) - 30.20
1962	8.03	2.00 - 14.30	(1.80) - 18.70
1963	8.62	3.90 - 13.60	1.10 - 17.30
1964	9.54	5.40 - 15.10	1.80 - 18.20
1965	10.05	6.80 - 14.00	3.80 - 16.90
1966	9.08	3.30 - 16.40	(1.50) - 20.10
1967			

¹ Commercial high-medium-low breakdown based on company commercial sales volume.

² Averages weighted by companies' commercial sales volume.

Table X-34

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALF'S

High Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
1958	5.41	3.84 - 6.98	2.83 - 7.99	7.26	18.11 - 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 - 15.33	3.56 - 19.94
1967						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-35

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

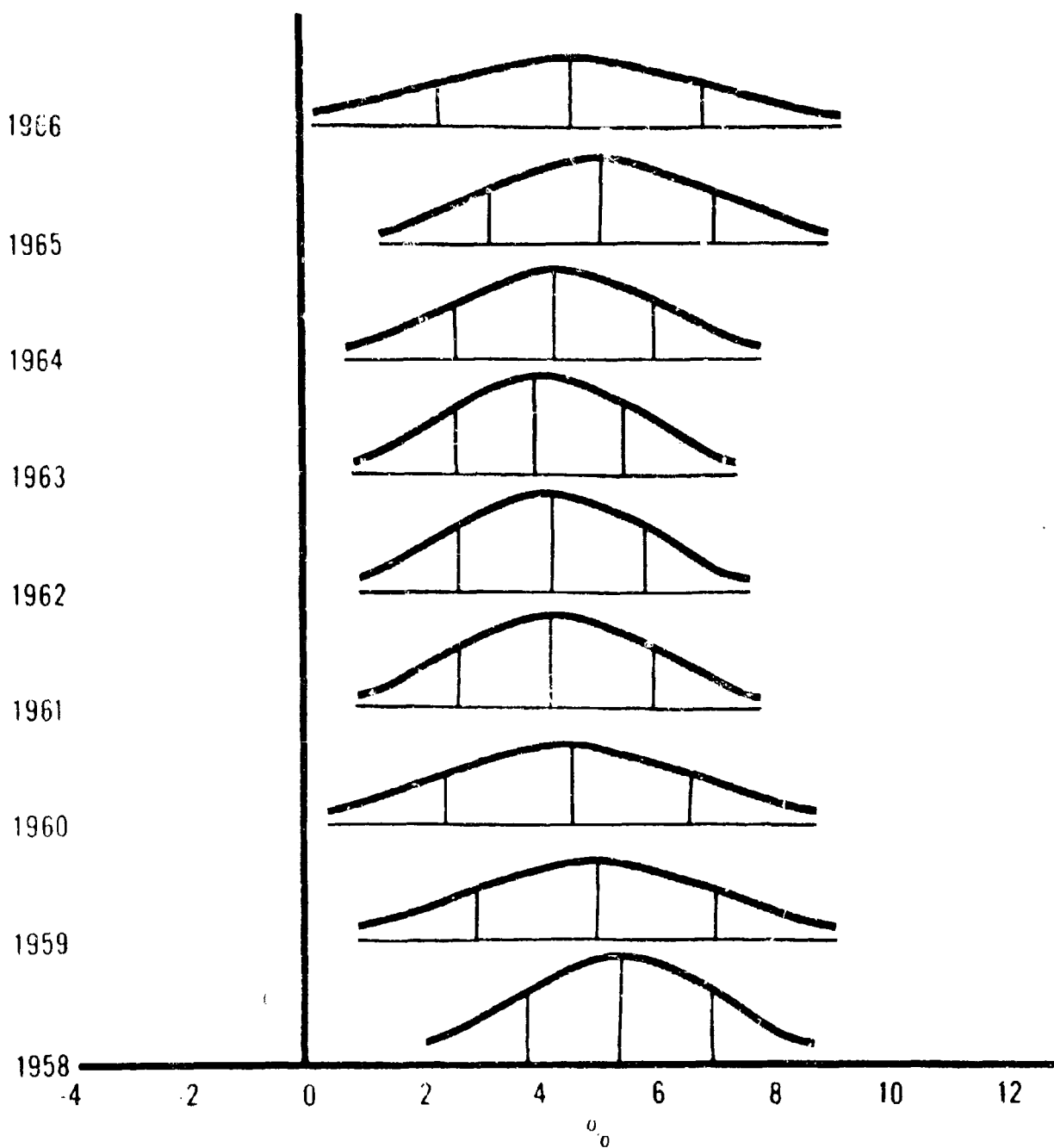


CHART X- 18
(TABLE X- 35)

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

High Volume Category

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	8.10	(4.32) - 20.52	(12.33) - 28.53
1959	6.91	(7.30) - 21.12	(16.47) - 30.29
1960	5.23	(9.14) - 19.60	(18.41) - 28.87
1961	4.65	(12.44) - 21.74	(23.46) - 32.76
1962	8.01	1.98 - 14.04	(1.91) - 17.93
1963	8.19	3.29 - 13.09	0.13 - 16.25
1964	9.77	5.27 - 14.27	2.37 - 17.17
1965	10.24	7.13 - 13.35	5.12 - 15.36
1966	8.47	2.01 - 14.93	(2.16) - 19.10
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

Table X-36

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Medium Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
1958	5.13	2.30 - 7.96	0.47 - 9.79	5.44	(16.48) - 27.36	(30.52) - 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	1.8 - 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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

Table X-37

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

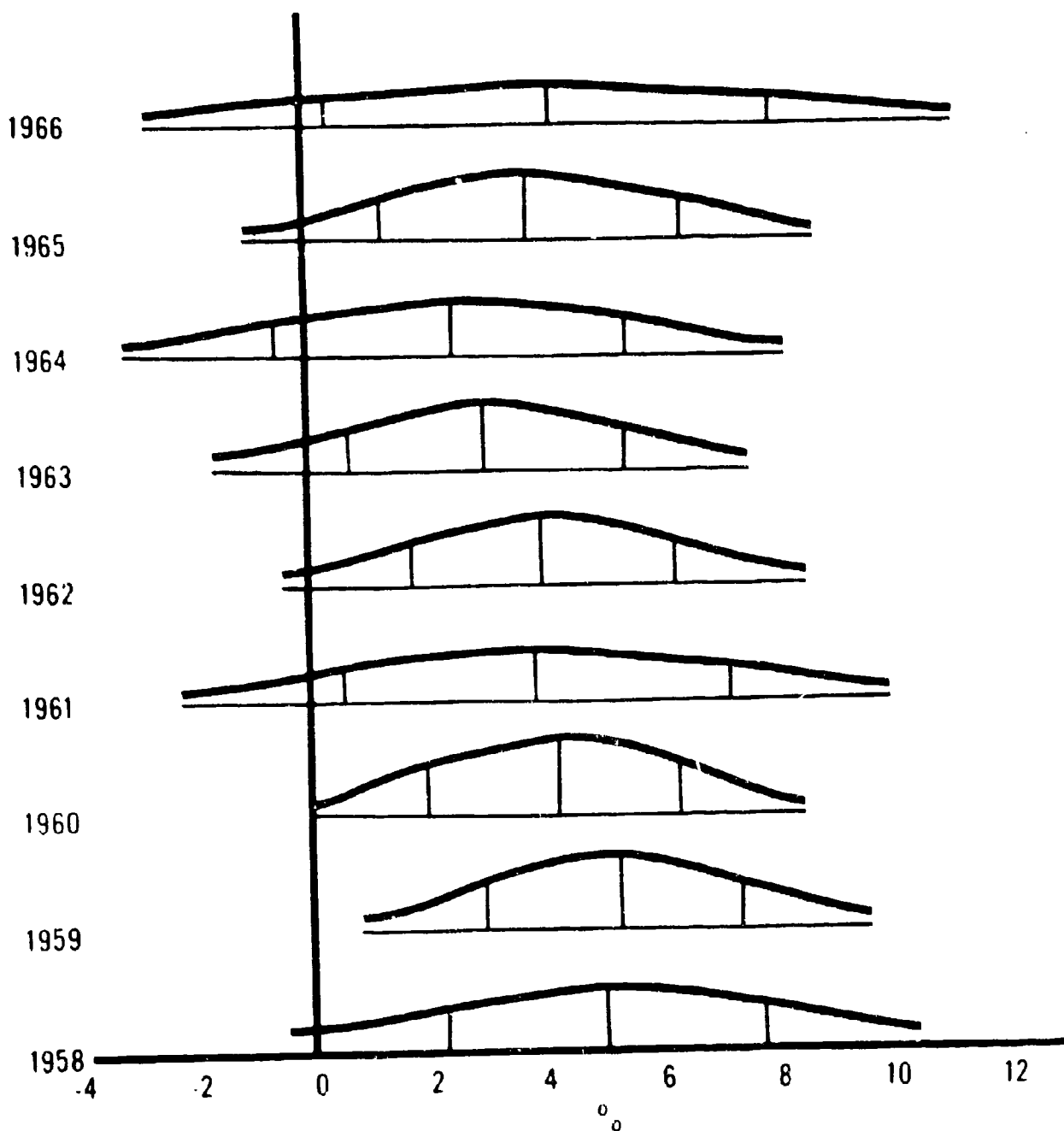


CHART X-19
(TABLE X-37)

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Medium Volume Category

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	1.63	(19.70) - 22.96	(33.46) - 36.72
1959	2.32	(15.00) - 19.64	(26.17) - 30.81
1960	(6.10)	(27.57) - 15.37	(41.42) - 29.22
1961	7.98	3.24 - 12.72	0.18 - 15.78
1962	8.10	1.29 - 14.91	(3.10) - 19.30
1963	9.89	5.11 - 14.67	2.03 - 17.75
1964	8.76	2.22 - 15.30	(2.00) - 19.52
1965	9.43	2.92 - 16.04	(1.44) - 20.30
1966	10.92	4.27 - 17.57	(0.02) - 21.86
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

Table X-38

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Low Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense sales volume.

³Averages weighted by companies' commercial sales volume.

DEFENSE PROFITS/DEFENSE SALES
LOW VOLUME COMPANIES

DISTRIBUTIONS OF THE RATIO

68%

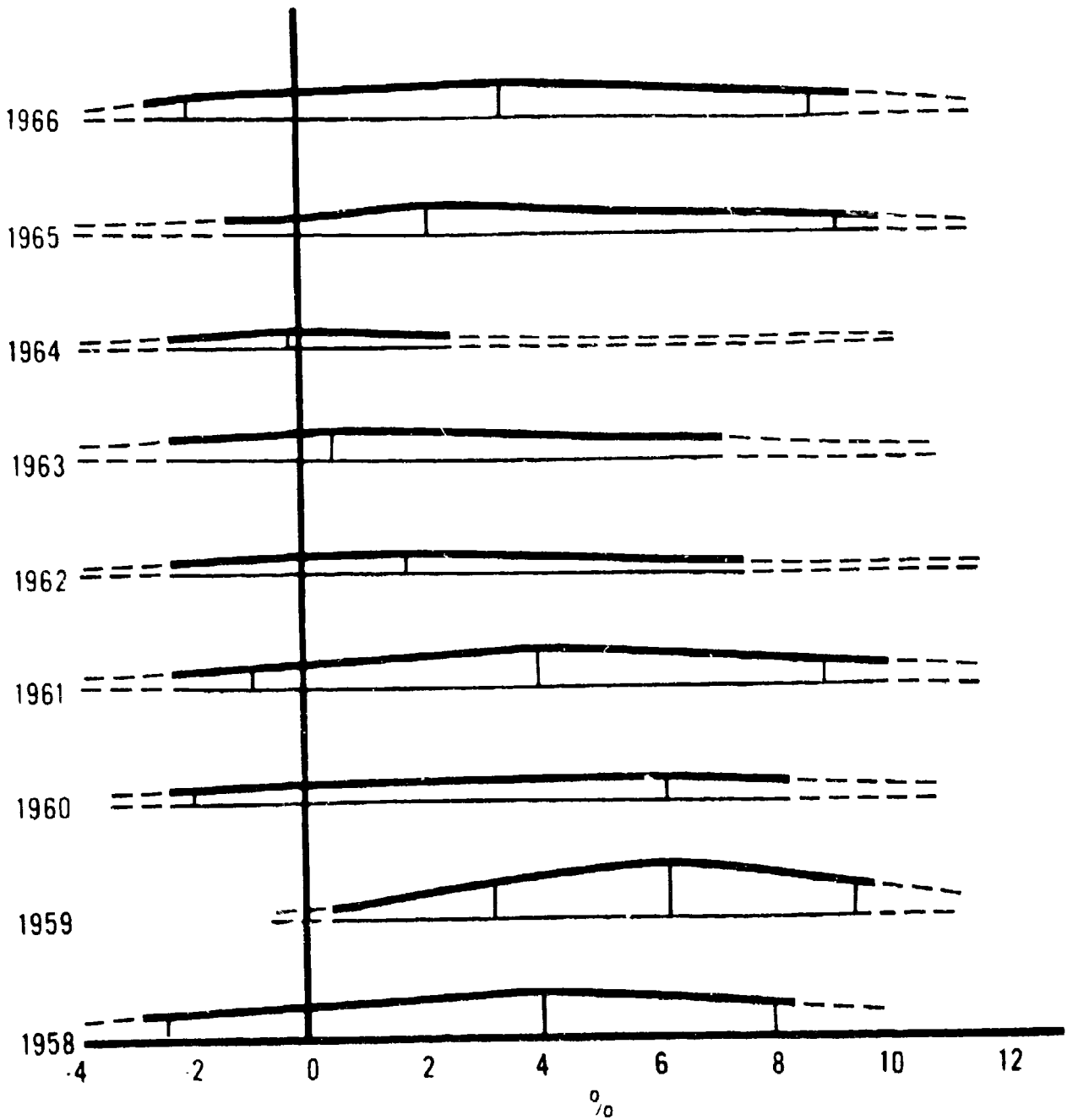


CHART X-20
(TABLE X-39)

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/SALES

Low Volume Category

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(14.25)	(80.85) - 52.35	(123.81) - 95.31
1959	6.27	(8.03) - 20.57	(17.25) - 29.79
1960	3.95	(15.87) - 23.77	(28.65) - 36.55
1961	6.46	(6.84) - 19.76	(15.42) - 28.34
1962	7.75	(5.11) - 20.61	(13.40) - 28.90
1963	6.07	(7.11) - 19.25	(15.61) - 27.75
1964	8.06	(0.79) - 16.91	(6.50) - 22.62
1965	6.22	(3.61) - 16.05	(9.95) - 22.39
1966	8.21	(8.37) - 24.79	(19.06) - 35.48
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial sales volume.

Table X-40

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/EC²

Total Population

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-41

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Total Population

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(0.58)	(55.10) - 95.20	(331.20) - 261.10
1959	17.57	(31.50) - 69.10	(67.80) - 104.30
1960	8.82	(47.00) - 76.60	(102.80) - 127.50
1961	16.19	(59.70) - 99.90	(138.80) - 168.70
1962	23.25	(4.90) - 49.70	(28.70) - 79.40
1963	21.22	(3.50) - 47.50	(30.10) - 77.60
1964	23.30	1.20 - 49.80	(21.40) - 67.00
1965	22.05	3.90 - 47.70	(18.40) - 60.60
1966	26.42	(10.70) - 65.70	(42.50) - 98.90
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-42

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High and Medium Volume Categories

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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	(5.90) - 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	(5.50) - 43.30	27.49	3.10 - 59.10	(19.90) - 75.30
1967						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High and Medium Volume Categories

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	18.04	(25.10) - 65.90	(59.20) - 98.20
1959	15.63	(28.50) - 64.10	(61.70) - 95.60
1960	7.04	(41.10) - 69.80	(91.50) - 118.00
1961	16.15	(81.60) - 117.50	(166.00) - 191.80
1962	24.06	2.40 - 42.70	(11.90) - 59.80
1963	24.40	3.90 - 39.40	(9.40) - 56.40
1964	27.72	8.50 - 46.70	(5.80) - 62.00
1965	28.98	12.70 - 45.90	(0.60) - 58.20
1966	27.67	(1.90) - 55.80	(21.10) - 76.30
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-44

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High Volume Category

DEFENSE COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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) - 120.36
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-45

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

High Volume CategoryCOMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	19.31	(22.95) - 61.57	(50.21) - 88.83
1959	16.42	(26.88) - 59.72	(54.81) - 87.65
1960	13.14	(35.23) - 61.51	(66.43) - 92.71
1961	12.26	(103.58) - 128.10	(178.30) - 202.82
1962	21.27	3.43 - 39.11	(8.08) - 50.62
1963	20.92	5.56 - 36.28	(4.35) - 46.19
1964	26.40	9.35 - 43.45	(1.65) - 54.45
1965	28.12	13.46 - 42.78	4.00 - 52.24
1966	23.78	(3.02) - 50.58	(20.31) - 67.87
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-46

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Medium Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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	0.63 - 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	12.64	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/ECI

Medium Volume Category

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	9.25	(83.09) - 99.59	(142.00) - 158.50
1959	11.15	(60.89) - 83.19	(107.36) - 129.66
1960	(29.79)	(187.27) - 127.69	(288.84) - 225.26
1961	33.57	0.81 - 66.33	(20.32) - 87.46
1962	36.89	1.24 - 72.54	(21.75) - 95.53
1963	40.94	5.19 - 76.69	(17.87) - 99.75
1964	34.46	(2.50) - 71.42	(26.34) - 95.26
1965	32.65	2.42 - 62.88	(17.08) - 82.38
1966	44.58	8.56 - 80.60	(14.67) - 103.83
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial ECI.

Table X-48

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Low Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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) - 43.99	(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	3.68 - 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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense ECI.

³Averages weighted by companies' commercial ECI.

Table X-49

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/ECI

Low Volume Category

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(45.09)	(354.19) - 264.01	(553.56) - 463.38
1959	22.07	(38.86) - 83.00	(78.16) - 122.30
1960	12.77	(65.17) - 90.71	(115.44) - 140.98
1961	16.27	(40.69) - 73.23	(77.43) - 109.97
1962	21.97	(21.23) - 65.17	(49.09) - 93.03
1963	16.32	(25.68) - 58.32	(52.77) - 85.41
1964	18.05	(12.93) - 49.03	(32.91) - 69.01
1965	13.81	(13.02) - 40.64	(30.33) - 57.95
1966	24.72	(31.36) - 80.80	(67.53) - 116.97
1967			

¹ Commercial high-medium-low breakdown based on company commercial sales volume.

² Averages weighted by companies' commercial ECI.

Table X-50

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Total Population

COMMERCIAL¹

DEFENSE

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Total Population

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(0.45)	(41.50) - 72.70	(290.00) - 223.10
1959	14.18	(23.90) - 54.50	(52.80) - 84.20
1960	7.12	(35.70) - 58.80	(85.20) - 104.90
1961	13.25	(29.20) - 62.40	(65.70) - 93.20
1962	19.01	(4.00) - 39.40	(23.10) - 68.80
1963	16.98	(3.50) - 36.50	(24.10) - 64.20
1964	18.84	2.00 - 38.90	(18.30) - 54.40
1965	17.66	3.60 - 37.80	(15.10) - 49.00
1966	20.38	(8.30) - 48.40	(35.60) - 83.10
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

High and Medium Volume Categories

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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 - 35.40	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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-53

WEIGHTED AVERAGES AND RANGE DATA
PROFIT/TCI

High and Medium Volume Categories

COMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	14.02	(19.30) - 52.40	(46.60) - 77.80
1959	12.29	(20.90) - 49.40	(46.40) - 74.10
1960	5.53	(28.40) - 51.40	(66.50) - 87.50
1961	12.66	(32.60) - 67.60	(74.20) - 99.00
1962	18.76	1.60 - 32.60	(9.90) - 46.50
1963	18.63	2.60 - 34.10	(8.60) - 44.20
1964	21.47	7.80 - 34.80	(3.90) - 46.00
1965	22.05	9.50 - 35.10	(0.70) - 45.50
1966	20.21	(0.20) - 38.70	(13.60) - 53.30
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-54

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

High Volume Category

DEFENSE ¹COMMERCIAL

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

Table X-55

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

High Volume CategoryCOMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	15.23	(17.79) - 48.25	(39.09) - 69.55
1959	13.02	(19.44) - 45.48	(40.38) - 66.42
1960	10.35	(24.09) - 44.79	(46.30) - 67.00
1961	9.64	(46.30) - 65.58	(82.38) - 101.66
1962	16.56	3.01 - 30.11	(5.73) - 38.85
1963	15.86	3.85 - 27.87	(3.90) - 35.62
1964	20.23	8.44 - 32.02	0.84 - 39.62
1965	21.37	10.20 - 32.54	3.00 - 39.74
1966	17.24	(0.42) - 34.90	(11.81) - 46.29
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-56

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Medium Volume Category

COMMERCIAL¹

DEFENSE

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.²Averages weighted by companies' defense TCI.³Averages weighted by companies' commercial TCI.

Table X-57

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Medium Volume CategoryCOMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	5.75	(63.94) - 75.44	(108.89) - 120.39
1959	8.35	(49.40) - 66.10	(86.65) - 103.35
1960	(22.46)	(141.63) - 96.71	(218.49) - 173.57
1961	25.98	(1.30) - 53.26	(18.90) - 70.86
1962	28.94	(1.58) - 59.46	(21.27) - 79.15
1963	32.37	0.99 - 63.75	(19.25) - 83.99
1964	28.23	(4.42) - 60.88	(25.48) - 81.94
1965	24.97	(0.18) - 50.12	(16.40) - 66.34
1966	33.67	6.27 - 61.07	(11.40) - 78.74
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-58

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Low Volume Category

DEFENSE

COMMERCIAL¹

Year	Average ²	On 68% of defense sales vol., profit is expected to be between:	On 90% of defense sales vol., profit is expected to be between:	Average ³	On 68% of comm. sales vol., profit is expected to be between:	On 90% of comm. sales vol., profit is expected to be between:
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						

¹Commercial high-medium-low breakdown based on company defense sales volume.

²Averages weighted by companies' defense TCI.

³Averages weighted by companies' commercial TCI.

WEIGHTED AVERAGES AND RANGE DATA

PROFIT/TCI

Low Volume CategoryCOMMERCIAL¹

Year	Average ²	On 68% of commercial sales volume, profit is expected to be between:	On 90% of commercial sales volume, profit is expected to be between:
1958	(39.57)	(325.77) - 246.63	(510.37) - 431.23
1959	19.00	(32.47) - 70.47	(65.67) - 103.67
1960	11.10	(59.24) - 81.44	(104.61) - 126.81
1961	14.48	(24.27) - 53.23	(49.26) - 78.22
1962	19.48	(18.89) - 57.85	(43.64) - 82.60
1963	14.09	(21.29) - 49.47	(44.11) - 72.29
1964	15.41	(10.95) - 41.77	(27.95) - 58.77
1965	11.79	(10.95) - 34.53	(25.62) - 49.20
1966	20.66	(30.17) - 71.49	(62.96) - 104.28
1967			

¹Commercial high-medium-low breakdown based on company commercial sales volume.

²Averages weighted by companies' commercial TCI.

Table X-60

SECTION XI

ESTIMATING POPULATION SIZE

A. INTRODUCTION

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

It is also 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 was therefore necessary to estimate population sales volume. The Contractor Awards List was the most adequate source of information. That list is a compilation of awards to several thousand companies. From the list it was possible to obtain total defense awards data, 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. It was necessary, therefore, to find a way to estimate population sales from data on contract awards to the population.

For each of the three population categories in each year, the following two ratios were hypothesized as being equal:

$$\frac{\text{Prime defense awards to the sample}}{\text{Prime defense awards to the population}} ; \frac{\text{Total defense sales for the sample}}{\text{Total defense sales for the population.}}$$

The above hypothesis implies that each of the following ratios is the same for the sample as for the population in any given year:

- 1) $\frac{\text{Prime defense awards}}{\text{Prime defense sales}}$
- 2) $\frac{\text{Prime defense sales}}{\text{Total defense sales}}$

The above relationships seemed logical. 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 prime 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 prime 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 XI-1. The resulting definition of High, Medium and Low volume categories in terms of prime awards, is as follows:

High - Companies with Prime awards in excess of \$174 million annually

- Medium - Companies with Prime awards between \$16.75 million and \$174 million annually
- Low - Companies with Prime awards between \$.5 million and \$16.75 million annually

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

1) High and Medium Volume Population

a. Prime Awards over \$25M. The FY '65 "Top 100" portion of the Contractor Awards List represents 68.9% (\$16.7B) of the total prime contract awards (\$24.2B), and includes all companies which were awarded \$25 million or more in prime contracts.

b. Prime Awards Between \$20M and \$25M. The ASD (Comptroller)'s Office made available two edited lists (i.e., 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 (47, in this 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. Prime 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 prime contract awards between \$16.75M

to \$174.0M (See Chart XI-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 prime contract 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 which meet the population criteria
- iii. those not meeting the population criteria.

Companies in i. or ii. were separated into those with more than \$174M in prime contract awards in FY '65, and those with less than that amount. (See Chart XI-1). Those with more than \$174M in prime awards were considered to be the High volume population. The remainder were considered to comprise the Medium volume population.

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

<u>Category</u>	<u>Prime Defense Awards</u>
High Volume Population	\$ 11,457.2M
Medium Volume Population	2,764.6M

2) Low Volume Population

Of total DoD prime awards of \$24.2B in FY '65, the analysis of High and Medium volume populations (see paragraph 1), above) accounted for \$17.6B or almost 73% including companies manufacturing non-durable goods or having less than 10% or less than \$1M in defense sales).

The remaining \$6.6B prime awards were adjusted to obtain an estimate of the prime awards to the Low volume population. Adjustments were made as follows:

a. Subtract 21.82% 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 (OSD), is equivalent to the ratio of durable goods awards to total awards for the Low volume companies).

b. Subtract 25.0% (based on best judgment) representing companies with less than 10% defense sales or less than \$1M defense sales. (\$500K prime awards were used because total defense sales were assumed to be twice prime awards for Low volume companies, based on the Prime/Sub mix 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 prime 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 limited sampling of Low volume companies and the variation in data from those companies. This uncertainty is indicated in the confidence interval data in Section X.

3) Population Prime Defense Award Estimates for Years Prior to 1965 and for 1966

It was hypothesized that prime defense awards to the High volume sample represent a constant percentage of prime defense awards to the High volume population for all years. Analysis of the top 100 lists for FY '60 through FY '65 supported 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 prime defense awards to the Medium and Low volume samples represent constant percentages of prime defense awards to the corresponding populations for all years.

Therefore, it was not necessary to estimate the dollar volume of prime defense awards to the High, Medium or Low volume populations for years prior to 1965 or for 1966.

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

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

	<u>I</u>	<u>II</u>	<u>III</u>
<u>Category</u>	<u>Sample Prime Defense Awards</u>	<u>Population Prime Defense Awards</u>	<u>I as a % of II</u>
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 years prior to 1965 and for 1966.

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 XI-1.

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

$$\begin{aligned} \frac{\text{sample defense investment}^1}{\text{population defense investment}^1} &= \frac{\text{sample defense sales}}{\text{population defense sales}} \\ &= .9239 \text{ for the High volume category} \\ &= .4967 \text{ for the Medium volume category} \\ &= .0346 \text{ for the Low volume category} \end{aligned}$$

The population estimates for defense equity capital investment (ECI), and the defense ECI weighting factors by

¹Equity capital investment or total capital investment.

by population category, are presented in Table XI-2. The same information for defense total capital investment (TCI) is shown in Table XI-3.

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 sample commercial sales/population commercial sales

- = .9239 for the High defense volume category
- = .4967 for the Medium defense volume category
- = .0346 for the Low defense volume category

¹Prime and subcontract.

Resulting population estimates for commercial sales, and corresponding weighting factors, are given in Table XI-4

2) Procedure for Estimating Commercial ECI and TCI for the Population

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 commercial sample sales/population sales ratios.

$$\begin{aligned}
 &\frac{\text{Commercial ECI for the sample}}{\text{Commercial ECI for the population}} = \frac{\text{Commercial TCI for the sample}}{\text{Commercial TCI for the population}} \\
 &= .9239 \text{ for the High defense volume category} \\
 &= .4967 \text{ for the Medium defense volume category} \\
 &= .0346 \text{ for the Low defense volume category}
 \end{aligned}$$

Resulting population estimates for commercial ECI and TCI, and corresponding weighting factors, are given in Tables XI-5 and XI-6.

E. PROCEDURE FOR ESTIMATING POPULATION SALES VOLUME, ECI AND TCI OF THE COMMERCIAL VOLUME CATEGORIES

Difficulty in obtaining commercial business data for the population led to formulation of the following hypothesis for each category:

$$\begin{aligned}
 &\frac{\text{Defense sales}^1 \text{ (or ECI or TCI) for the defense sample}}{\text{Defense sales}^1 \text{ (or ECI or TCI) for the population}} = \frac{\text{Commercial sales (or ECI or TCI) for the Commercial Sample}}{\text{Commercial sales (or ECI or TCI) for the population}}
 \end{aligned}$$

¹Prime and subcontract.

Examination of High volume category data and comparison with hypotheses previously accepted led to acceptance of the above hypothesis. Hence the sample commercial sales/population commercial sales, sample commercial ECI/population commercial ECI, and sample commercial TCI/population commercial TCI ratios are all the same. They equal:

.9239 for the High commercial volume category

.4967 for the Medium commercial volume category

.0346 for the Low commercial volume category

Resulting population estimates and weighting factors are presented in Tables XI-7, XI-8, and XI-9.

F. 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.

The data of Tables XI-1 through XI-9 were recalculated for use in combining High and Medium volume category data. The revised tables are numbered XI-10 through XI-18.

**RELATIONSHIP BETWEEN DEFENSE SALES VOLUME
& % SUBCONTRACT SALES**
(BASED ON 1965 SAMPLE DATA)

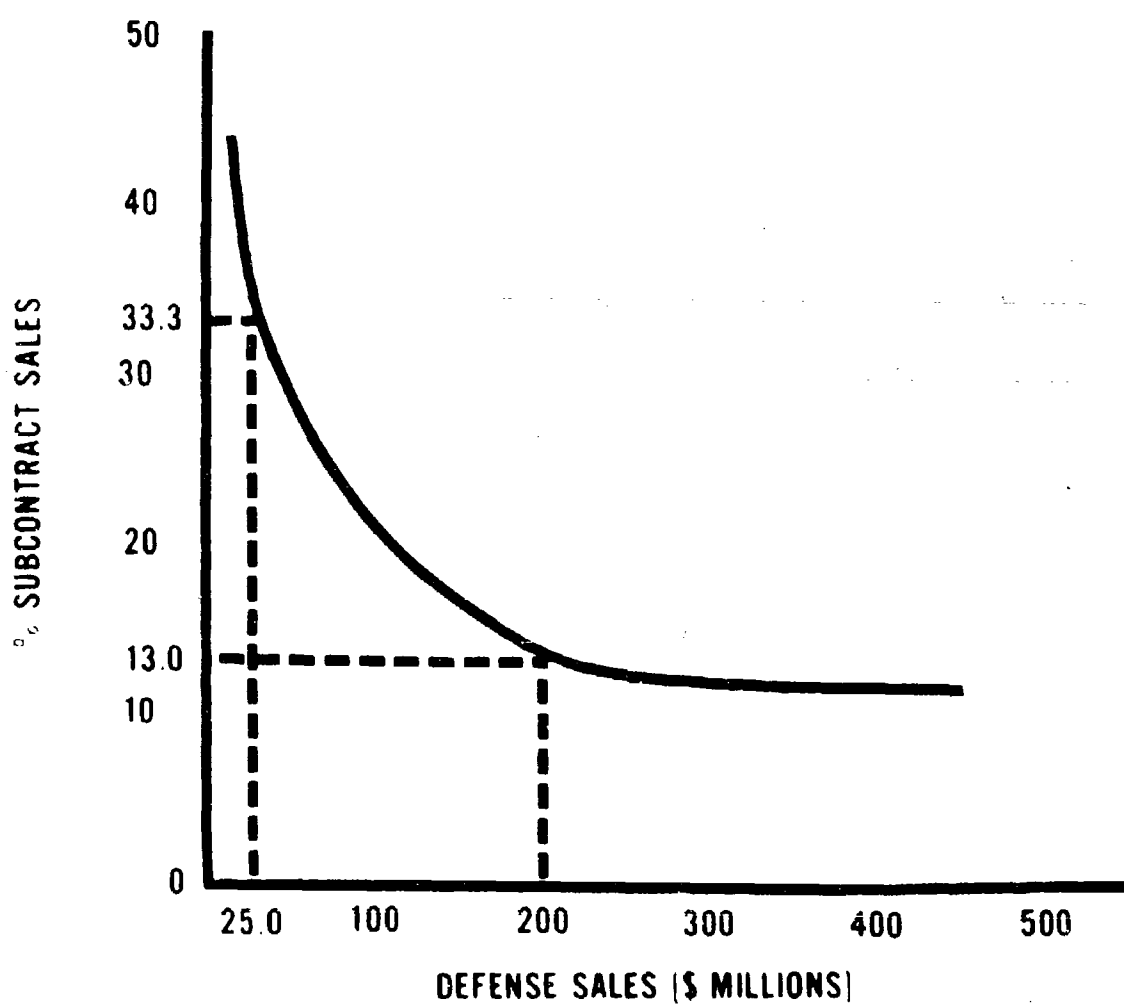


CHART XI-1

Table XI-1

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Defense: Sales

High, Medium and Low Defense Volume

	<u>Sample Defense Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. Sales Weightings</u>
<u>1966</u>				
High	\$12,799.2M	.9239	\$13,853.4M	51.1
Med.	1,939.2M	.4967	3,904.2M	14.4
Low	324.3M	.0346	9,373.0M	34.5
			<u>\$27,130.6M</u>	
<u>1965</u>				
High	\$11,153.1M	.9239	\$12,071.8M	53.3
Med.	1,606.3M	.4967	3,233.9M	14.3
Low	253.6M	.0346	7,329.9M	32.4
			<u>\$22,635.6M</u>	
<u>1964</u>				
High	\$11,932.8M	.9239	\$12,915.7M	52.9
Med.	1,566.8M	.4967	3,154.4M	12.9
Low	289.1M	.0346	8,356.4M	34.2
			<u>\$24,426.5M</u>	
<u>1963</u>				
High	\$13,231.0M	.9239	\$14,320.8M	54.4
Med.	1,650.5M	.4967	3,322.9M	12.6
Low	300.6M	.0346	8,687.6M	33.0
			<u>\$26,331.3M</u>	
<u>1962</u>				
High	\$13,581.2M	.9239	\$14,699.1M	56.0
Med.	1,798.7M	.4967	3,621.3M	13.8
Low	274.6M	.0346	7,936.9M	30.2
			<u>\$26,257.3M</u>	
<u>1961</u>				
High	\$12,542.0M	.9239	\$13,575.1M	58.8
Med.	1,669.5M	.4967	3,361.9M	14.6
Low	212.1M	.0346	6,131.0M	26.6
			<u>\$23,068.0M</u>	
<u>1960</u>				
High	\$11,899.2M	.9239	\$12,879.3M	62.5
Med.	1,381.8M	.4967	2,782.0M	13.5
Low	171.0M	.0346	4,942.7M	24.0
			<u>\$20,604.0M</u>	

Table XI-1

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Defense: Sales (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Defense Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. Sales Weightings</u>
<u>1959</u>				
High	\$12,172.8M	.9239	\$13,175.5M	6'
Med.	1,199.1M	.4967	2,414.2M	1
Low	164.6M	.0346	4,757.2M	2
			<u>\$20,346.9M</u>	
<u>1958</u>				
High	\$11,710.1M	.9239	\$12,674.6M	69.8
Med.	995.6M	.4967	2,004.4M	11.0
Low	120.5M	.0346	3,482.8M	19.2
			<u>\$18,161.8M</u>	

Table XI-2

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Defense: ECI

High, Medium and Low Defense Volume

	<u>Sample Defense ECI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. ECI Weightings</u>
<u>1966</u>				
High	\$ 3,074.5M	.9239	\$ 3,327.7M	44.5
Med.	609.9M	.4967	1,227.9M	16.4
Low	101.4M	.0346	2,930.8M	39.1
			<u>\$ 7,486.4M</u>	
<u>1965</u>				
High	\$ 2,760.4M	.9239	\$ 2,987.7M	44.2
Med.	536.9M	.4967	1,081.0M	16.0
Low	93.1M	.0346	2,691.6M	39.8
			<u>\$ 6,760.3M</u>	
<u>1964</u>				
High	\$ 2,792.9M	.9239	\$ 3,023.0M	43.8
Med.	531.9M	.4967	1,070.9M	15.5
Low	97.1M	.0346	2,807.2M	40.7
			<u>\$ 6,901.1M</u>	
<u>1963</u>				
High	\$ 2,883.6M	.9239	\$ 3,121.1M	42.4
Med.	579.7M	.4967	1,167.2M	15.8
Low	106.6M	.0346	3,080.5M	41.8
			<u>\$ 7,368.8M</u>	
<u>1962</u>				
High	\$ 2,815.2M	.9239	\$ 3,047.0M	41.6
Med.	589.0M	.4967	1,185.8M	16.2
Low	106.7M	.0346	3,084.0M	42.1
			<u>\$ 7,316.8M</u>	
<u>1961</u>				
High	\$ 2,598.3M	.9239	\$ 2,812.3M	43.2
Med.	546.5M	.4967	1,100.2M	16.9
Low	89.9M	.0346	2,597.2M	39.9
			<u>\$ 6,509.7M</u>	
<u>1960</u>				
High	\$ 2,364.4M	.9239	\$ 2,559.1M	49.3
Med.	404.4M	.4967	814.1M	15.7
Low	62.8M	.0346	1,814.7M	35.0
			<u>\$ 5,187.9M</u>	

Defense: ECI (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Defense ECI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. ECI Weightings</u>
<u>1959</u>				
High	\$ 2,496.2M	.9239	\$ 2,701.8M	53.5
Med.	317.8M	.4967	639.9M	12.7
Low	59.0M	.0346	1,705.7M	33.8
			<u>\$ 5,047.4M</u>	
<u>1958</u>				
High	\$ 2,389.5M	.9239	\$ 2,586.3M	60.4
Med.	281.3M	.4967	566.4M	13.2
Low	39.1M	.0346	1,129.0M	26.4
			<u>\$ 4,281.7M</u>	

Table XI-3

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Defense: TCI

High, Medium and Low Defense Volume

	<u>Sample Defense TCI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. TCI Weightings</u>
<u>1966</u>				
High	\$ 4,039.3M	.9239	\$ 4,372.0M	43.9
Med.	871.8M	.4967	1,755.2M	17.6
Low	132.8M	.0346	3,836.9M	38.5
			<u>\$ 9,964.1M</u>	
<u>1965</u>				
High	\$ 3 347.8M	.9239	\$ 3,623.5M	42.1
Med.	775.2M	.4967	1,560.7M	18.1
Low	118.7M	.0346	3,429.5M	39.8
			<u>\$ 8,613.7M</u>	
<u>1964</u>				
High	\$ 3,425.3M	.9239	\$ 3,707.4M	40.7
Med.	759.2M	.4967	1,528.5M	16.8
Low	133.7M	.0346	3,863.6M	42.5
			<u>\$ 9,099.5M</u>	
<u>1963</u>				
High	\$ 3,644.0M	.9239	\$ 3,944.1M	41.3
Med.	781.2M	.4967	1,572.8M	16.5
Low	139.4M	.0346	4,028.3M	42.2
			<u>\$ 9,545.2M</u>	
<u>1962</u>				
High	\$ 3,524.2M	.9239	\$ 3,814.7M	40.7
Med.	792.2M	.4967	1,595.0M	17.0
Low	137.1M	.0346	3,962.6M	42.3
			<u>\$ 9,372.1M</u>	
<u>1961</u>				
High	\$ 3,221.1M	.9239	\$ 3,486.4M	42.4
Med.	720.6M	.4967	1,450.8M	17.6
Low	114.0M	.0346	3,294.5M	40.0
			<u>\$ 8,231.7M</u>	
<u>1960</u>				
High	\$ 2,899.6M	.9239	\$ 3,138.5M	48.6
Med.	516.1M	.4967	1,039.0M	16.1
Low	78.7M	.0346	2,275.9M	35.3
			<u>\$ 6,453.4M</u>	

Table XI-3
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Defense: TCI (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Defense TCI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. TCI Weightings</u>
<u>1959</u>				
High	\$ 3,081.5M	.9239	\$ 3,335.3M	52.9
Med.	404.5M	.4967	814.4M	12.9
Low	74.7M	.0346	2,159.0M	34.2
			<u>\$ 6,308.7M</u>	
<u>1958</u>				
High	\$ 2,907.1M	.9239	\$ 3,146.5M	59.7
Med.	359.9M	.4967	724.5M	13.7
Low	48.6M	.0346	1,403.9M	26.6
			<u>\$ 5,274.9M</u>	

Table XI-4

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Commercial: Sales

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1966</u>				
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
			<u>\$33,437.7M</u>	
<u>1965</u>				
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
			<u>\$26,755.8M</u>	
<u>1964</u>				
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
			<u>\$23,167.2M</u>	
<u>1963</u>				
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
			<u>\$20,540.7M</u>	
<u>1962</u>				
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
			<u>\$20,372.3M</u>	
<u>1961</u>				
High	\$ 6,463.7M	.9239	\$ 6,996.1M	40.66
Med.	1,652.0M	.4967	3,320.0M	19.33
Low	238.2M	.0346	6,884.4M	40.01
			<u>\$17,206.5M</u>	
<u>1960</u>				
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
			<u>\$14,437.2M</u>	

Commercial: Sales (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1959</u>				
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
			<u>\$12,570.2M</u>	
<u>1958</u>				
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
			<u>\$ 9,785.8M</u>	

Table X1-5

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Commercial: ECI

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
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
			<u>\$11,212.8M</u>	
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
			<u>\$ 9,935.0M</u>	
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
			<u>\$ 8,711.2M</u>	
1963				
High	\$ 2,466.2M	.9239	\$ 2,669.3M	34.11
Med.	656.5M	.4967	1,321.7M	16.89
Low	132.7M	.0346	3,835.3M	49.00
			<u>\$ 7,826.3M</u>	
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
			<u>\$ 7,272.5M</u>	
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
			<u>\$ 6,715.8M</u>	
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
			<u>\$ 5,396.7M</u>	

Table XI-5

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Commercial: ECI (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
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
			<u>\$ 4,809.5M</u>	
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
			<u>\$ 3,635.3M</u>	

Commercial: TCI

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1966</u>				
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
			<u>\$15,204.2M</u>	
<u>1965</u>				
High	\$ 3,973.0M	.9239	\$ 4,300.2M	33.77
Med.	1,310.0M	.4967	2,637.2M	20.72
Low	200.5M	.0346	5,794.8M	45.51
			<u>\$12,732.4M</u>	
<u>1964</u>				
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
			<u>\$11,228.9M</u>	
<u>1963</u>				
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
			<u>\$10,061.1M</u>	
<u>1962</u>				
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
			<u>\$ 9,214.1M</u>	
<u>1961</u>				
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
			<u>\$ 8,535.4M</u>	
<u>1960</u>				
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
			<u>\$ 6,796.0M</u>	

Commercial: TCI (Cont.)

High, Medium and Low Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1959</u>				
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
			<u>\$ 6,069.7M</u>	
<u>1958</u>				
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
			<u>\$ 4,754.6M</u>	

Table XI-7

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Commercial: Sales

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1966</u>				
High	\$11,585.1M	.9239	\$12,539.4M	43.6
Med.	2,083.1M	.4967	4,194.0M	14.6
Low	416.9M	.0346	12,050.3M	41.8
			<u>\$28,783.7M</u>	
<u>1965</u>				
High	\$ 9,864.8M	.9239	\$10,677.3M	46.8
Med.	1,577.5M	.4967	3,176.1M	13.9
Low	310.1M	.0346	8,963.1M	39.3
			<u>\$22,816.5M</u>	
<u>1964</u>				
High	\$ 8,496.5M	.9239	\$ 9,196.4M	47.1
Med.	1,310.7M	.4967	2,638.7M	13.5
Low	266.4M	.0346	7,699.1M	39.4
			<u>\$19,534.2M</u>	
<u>1963</u>				
High	\$ 7,275.4M	.9239	\$ 7,874.7M	46.1
Med.	1,335.8M	.4967	2,689.4M	15.8
Low	224.8M	.0346	6,498.2M	38.1
			<u>\$17,062.3M</u>	
<u>1962</u>				
High	\$ 7,133.8M	.9239	\$ 7,721.4M	45.5
Med.	1,431.4M	.4967	2,881.9M	17.0
Low	220.1M	.0346	6,360.2M	37.5
			<u>\$16,963.5M</u>	
<u>1961</u>				
High	\$ 6,870.9M	.9239	\$ 7,436.9M	50.1
Med.	1,318.8M	.4967	2,655.0M	17.9
Low	164.3M	.0346	4,747.5M	32.0
			<u>\$14,839.4M</u>	
<u>1960</u>				
High	\$ 6,961.3M	.9239	\$ 7,534.7M	50.5
Med.	1,200.9M	.4967	2,417.7M	16.2
Low	171.7M	.0346	4,962.9M	33.3
			<u>\$14,915.3M</u>	

Table XI-7

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Commercial: Sales (Cont.)

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1959</u>				
High	\$ 5,823.7M	.9239	\$ 6,303.3M	47.6
Med.	1,106.3M	.4967	2,227.3M	16.8
Low	163.2M	.0346	4,717.9M	35.6
			<u>\$13,248.5M</u>	
<u>1958</u>				
High	\$ 5,221.7M	.9239	\$ 5,651.8M	52.6
Med.	769.0M	.4967	1,548.2M	14.4
Low	122.6M	.0346	3,543.1M	33.0
			<u>\$10,743.1M</u>	

Commercial: ECI

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial ECI Weightings</u>
<u>1966</u>				
High	\$ 4,126.8M	.9239	\$ 4,466.7M	47.0
Med.	510.3M	.4967	1,027.4M	10.8
Low	138.6M	.0346	4,005.1M	42.2
			<u>\$ 9,499.2M</u>	
<u>1965</u>				
High	\$ 3,590.2M	.9239	\$ 3,885.9M	44.0
Med.	455.6M	.4967	917.2M	10.4
Low	139.6M	.0346	4,035.0M	45.6
			<u>\$ 8,838.1M</u>	
<u>1964</u>				
High	\$ 3,143.3M	.9239	\$ 3,402.2M	45.3
Med.	333.1M	.4967	670.6M	8.9
Low	118.9M	.0346	3,435.7M	45.8
			<u>\$ 7,508.5M</u>	
<u>1963</u>				
High	\$ 2,849.2M	.9239	\$ 3,083.9M	50.1
Med.	322.6M	.4967	649.4M	10.6
Low	83.6M	.0346	2,416.4M	39.3
			<u>\$ 6,149.7M</u>	
<u>1962</u>				
High	\$ 2,684.5M	.9239	\$ 2,905.6M	50.3
Med.	314.3M	.4967	632.8M	10.9
Low	77.7M	.0346	2,244.8M	38.8
			<u>\$ 5,783.2M</u>	
<u>1961</u>				
High	\$ 2,609.7M	.9239	\$ 2,824.7M	52.9
Med.	313.6M	.4967	631.3M	11.8
Low	65.2M	.0346	1,885.0M	35.3
			<u>\$ 5,341.0M</u>	
<u>1960</u>				
High	\$ 2,769.1M	.9239	\$ 2,997.2M	59.6
Med.	245.9M	.4967	495.0M	9.8
Low	53.1M	.0346	1,536.1M	30.6
			<u>\$ 5,028.3M</u>	

Commercial: ECI (Cont.)

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial ECI Weightings</u>
<u>1959</u>				
High	\$ 2,451.4M	.9239	\$ 2,653.3M	59.5
Med.	230.5M	.4967	464.0M	10.4
Low	46.4M	.0346	1,341.0M	30.1
			<u>\$ 4,458.3M</u>	
<u>1958</u>				
High	\$ 2,188.6M	.9239	\$ 2,368.9M	62.4
Med.	151.9M	.4967	305.8M	8.1
Low	38.8M	.0346	1,120.0M	29.5
			<u>\$ 3,794.7M</u>	

Table Xi-9

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Commercial: TCI

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial TCI Weightings</u>
<u>1966</u>				
High	\$ 5,692.2M	.9239	\$ 6,161.1M	50.0
Med.	675.6M	.4967	1,360.1M	11.1
Low	165.8M	.0346	4,791.2M	38.9
			<u>\$12,312.4M</u>	
<u>1965</u>				
High	\$ 4,724.1M	.9239	\$ 5,113.2M	46.3
Med.	595.8M	.4967	1,199.5M	10.9
Low	163.6M	.0346	4,727.0M	42.8
			<u>\$11,039.7M</u>	
<u>1964</u>				
High	\$ 4,103.6M	.9239	\$ 4,441.6M	47.8
Med.	406.6M	.4967	818.5M	8.8
Low	139.3M	.0346	4,025.9M	43.4
			<u>\$ 9,286.0M</u>	
<u>1963</u>				
High	\$ 3,758.5M	.9239	\$ 4,068.1M	52.9
Med.	408.0M	.4967	821.5M	10.7
Low	96.8M	.0346	2,798.4M	36.4
			<u>\$ 7,688.0M</u>	
<u>1962</u>				
High	\$ 3,449.2M	.9239	\$ 3,733.3M	52.8
Med.	400.7M	.4967	806.8M	11.4
Low	87.6M	.0346	2,531.7M	35.8
			<u>\$ 7,071.8M</u>	
<u>1961</u>				
High	\$ 3,318.0M	.9239	\$ 3,591.3M	55.0
Med.	405.1M	.4967	815.6M	12.5
Low	73.3M	.0346	2,119.0M	32.5
			<u>\$ 6,525.9M</u>	
<u>1960</u>				
High	\$ 3,516.9M	.9239	\$ 3,806.5M	61.1
Med.	326.2M	.4967	656.7M	10.5
Low	61.2M	.0346	1,767.5M	28.4
			<u>\$ 5,230.7M</u>	

Table XI-9

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Commercial: TCI (Cont.)

High, Medium and Low Commercial Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial TCI Weightings</u>
<u>1959</u>				
High	\$ 3,092.9M	.9239	\$ 3,347.6M	60.6
Med.	307.8M	.4967	619.6M	11.2
Low	53.9M	.0346	1,557.3M	28.2
			<u>\$ 5,524.5M</u>	
<u>1958</u>				
High	\$ 2,775.3M	.9239	\$ 3,003.9M	63.7
Med.	218.1M	.4967	439.0M	9.3
Low	44.2M	.0346	1,276.2M	27.0
			<u>\$ 4,719.1M</u>	

Table XI-10

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Defense: Sales

High and Medium Defense Volume

	<u>Sample Defense Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. Sales Weightings</u>
1966				
High	\$12,779.2M	.9239	\$13,853.4M	78.0
Med.	1,939.2M	.4967	3,904.2M	22.0
			<u>\$17,757.6M</u>	
1965				
High	\$11,153.1M	.9239	\$12,071.8M	78.9
Med.	1,606.3M	.4967	3,233.9M	21.1
			<u>\$15,305.7M</u>	
1964				
High	\$11,932.8M	.9239	\$12,915.7M	80.4
Med.	1,566.8M	.4967	3,154.4M	19.6
			<u>\$16,070.1M</u>	
1963				
High	\$13,231.0M	.9239	\$14,320.8M	81.2
Med.	1,650.5M	.4967	3,322.9M	18.8
			<u>\$17,643.7M</u>	
1962				
High	\$13,581.2M	.9239	\$14,699.1M	80.2
Med.	1,798.7M	.4967	3,621.3M	19.8
			<u>\$18,320.4M</u>	
1961				
High	\$12,542.0M	.9239	\$13,575.1M	80.2
Med.	1,669.5M	.4967	3,361.9M	19.8
			<u>\$16,937.0M</u>	
1960				
High	\$11,899.2M	.9239	\$12,879.3M	82.2
Med.	1,381.8M	.4967	2,782.0M	17.8
			<u>\$15,661.3M</u>	
1959				
High	\$12,172.8M	.9239	\$13,175.5M	84.5
Med.	1,199.1M	.4967	2,414.2M	15.5
			<u>\$15,589.7M</u>	
1958				
High	\$11,710.1M	.9239	\$12,674.6M	86.3
Med.	995.6M	.4967	2,004.4M	13.7
			<u>\$14,679.0M</u>	

Defense: ECI

High and Medium Defense Volume

	<u>Sample Defense ECI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. ECI Weightings</u>
1966				
High	\$ 3,074.5M	.9239	\$ 3,327.7M	73.0
Med.	609.9M	.4967	1,227.9M	27.0
			<u>\$ 4,555.6M</u>	
1965				
High	\$ 2,760.4M	.9239	\$ 2,987.7M	73.4
Med.	536.9M	.4967	1,081.0M	26.6
			<u>\$ 4,068.7M</u>	
1964				
High	\$ 2,792.9M	.9239	\$ 3,023.0M	73.8
Med.	531.9M	.4967	1,070.9M	26.2
			<u>\$ 4,093.9M</u>	
1963				
High	\$ 2,883.6M	.9239	\$ 3,121.1M	72.8
Med.	579.7M	.4967	1,167.2M	27.2
			<u>\$ 4,288.3M</u>	
1962				
High	\$ 2,815.2M	.9239	\$ 3,047.0M	72.0
Med.	589.0M	.4967	1,185.8M	28.0
			<u>\$ 4,232.8M</u>	
1961				
High	\$ 2,598.3M	.9239	\$ 2,812.3M	71.9
Med.	546.5M	.4967	1,100.2M	28.1
			<u>\$ 3,912.5M</u>	
1960				
High	\$ 2,364.4M	.9239	\$ 2,559.1M	75.9
Med.	404.4M	.4967	814.1M	24.1
			<u>\$ 3,373.2M</u>	
1959				
High	\$ 2,496.2M	.9239	\$ 2,701.8M	80.9
Med.	317.8M	.4967	639.9M	19.1
			<u>\$ 3,341.7M</u>	
1958				
High	\$ 2,389.5M	.9239	\$ 2,586.3M	82.0
Med.	281.3M	.4967	566.4M	18.0
			<u>\$ 3,152.7M</u>	

Table XI-12

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Defense: TCI

High and Medium Defense Volume

	<u>Sample Defense TCI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Def. TCI Weightings</u>
<u>1966</u>				
High	\$ 4,039.3M	.9239	\$ 4,372.0M	71.4
Med.	871.8M	.4967	1,755.2M	28.6
			<u>\$ 6,127.2M</u>	
<u>1965</u>				
High	\$ 3,347.8M	.9239	\$ 3,623.5M	69.9
Med.	775.2M	.4967	1,560.7M	30.1
			<u>\$ 5,184.2M</u>	
<u>1964</u>				
High	\$ 3,425.3M	.9239	\$ 3,707.4M	70.8
Med.	759.2M	.4967	1,528.5M	29.2
			<u>\$ 5,235.9M</u>	
<u>1963</u>				
High	\$ 3,644.0M	.9239	\$ 3,944.1M	71.5
Med.	781.2M	.4967	1,572.8M	28.5
			<u>\$ 5,516.9M</u>	
<u>1962</u>				
High	\$ 3,524.2M	.9239	\$ 3,814.5M	70.5
Med.	792.2M	.4967	1,595.0M	29.5
			<u>\$ 5,409.5M</u>	
<u>1961</u>				
High	\$ 3,221.1M	.9239	\$ 3,486.4M	70.6
Med.	720.6M	.4967	1,450.8M	29.4
			<u>\$ 4,937.2M</u>	
<u>1960</u>				
High	\$ 2,899.6M	.9239	\$ 3,138.5M	75.1
Med.	516.1M	.4967	1,039.0M	24.9
			<u>\$ 4,177.5M</u>	
<u>1959</u>				
High	\$ 3,081.5M	.9239	\$ 3,335.3M	80.4
Med.	404.5M	.4967	814.4M	19.6
			<u>\$ 4,149.7M</u>	
<u>1958</u>				
High	\$ 2,907.1M	.9239	\$ 3,146.5M	81.3
Med.	359.9M	.4967	724.5M	18.7
			<u>\$ 3,871.0M</u>	

Table XI-13

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Commercial: Sales

High and Medium Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
1966				
High	\$10,382.9M	.9239	\$11,238.1M	63.90
Med.	3,154.0M	.4967	6,349.9M	36.10
			<u>\$17,588.0M</u>	
1965				
High	\$ 8,749.9M	.9239	\$ 9,470.6M	64.54
Med.	2,585.0M	.4967	5,204.3M	35.46
			<u>\$14,674.9M</u>	
1964				
High	\$ 7,477.9M	.9239	\$ 8,093.8M	64.32
Med.	2,230.0M	.4967	4,489.6M	35.68
			<u>\$12,583.4M</u>	
1963				
High	\$ 6,651.5M	.9239	\$ 7,199.4M	65.88
Med.	1,852.0M	.4967	3,728.6M	34.12
			<u>\$10,928.0M</u>	
1962				
High	\$ 6,759.9M	.9239	\$ 7,313.4M	68.19
Med.	1,694.5M	.4967	3,411.5M	31.81
			<u>\$10,724.9M</u>	
1961				
High	\$ 6,463.7M	.9239	\$ 6,996.1M	67.71
Med.	1,652.0M	.4967	3,326.0M	32.19
			<u>\$10,332.1M</u>	
1960				
High	\$ 6,581.9M	.9239	\$ 7,124.0M	68.71
Med.	1,611.2M	.4967	3,243.8M	31.29
			<u>\$10,367.8M</u>	
1959				
High	\$ 5,372.5M	.9239	\$ 5,815.0M	64.38
Med.	1,598.2M	.4967	3,217.6M	35.62
			<u>\$ 9,032.6M</u>	
1958				
High	\$ 4,702.1M	.9239	\$ 5,089.4M	65.32
Med.	1,342.2M	.4967	2,702.2M	34.68
			<u>\$ 7,791.6M</u>	

Table XI-14

128

Commercial: ECI

High and Medium Defense Volume

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

Table X1-15

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Commercial: TCI

High and Medium Defense Volume

	<u>Sample Commercial Sales</u>	<u>Population</u>	<u>Estimated Population</u>	<u>Commercial TCI Weightings</u>
1966				
High	\$ 4,628.0M	.9239	\$ 5,225.7M	63.97
Med.	1,462.2M	.4967	2,943.8M	36.03
			<u>\$ 8,169.5M</u>	
1965				
High	\$ 3,973.0M	.9239	\$ 4,300.2M	61.98
Med.	1,310.0M	.4967	2,637.4M	38.02
			<u>\$ 6,937.6M</u>	
1964				
High	\$ 3,339.4M	.9239	\$ 3,614.5M	61.48
Med.	1,124.9M	.4967	2,264.7M	38.52
			<u>\$ 5,879.2M</u>	
1963				
High	\$ 3,103.1M	.9239	\$ 3,358.7M	62.57
Med.	997.8M	.4967	2,008.8M	37.43
			<u>\$ 5,367.5M</u>	
1962				
High	\$ 2,993.6M	.9239	\$ 3,240.2M	67.01
Med.	792.4M	.4967	1,595.3M	32.99
			<u>\$ 4,835.5M</u>	
1961				
High	\$ 2,955.4M	.9239	\$ 3,198.8M	69.25
Med.	705.5M	.4967	1,420.4M	30.75
			<u>\$ 4,619.2M</u>	
1960				
High	\$ 3,098.6M	.9239	\$ 3,353.8M	69.30
Med.	737.9M	.4967	1,485.6M	30.70
			<u>\$ 4,839.4M</u>	
1959				
High	\$ 2,663.9M	.9239	\$ 2,883.3M	66.19
Med.	731.4M	.4967	1,472.5M	33.81
			<u>\$ 4,355.8M</u>	
1958				
High	\$ 2,357.2M	.9239	\$ 2,551.4M	66.12
Med.	649.3M	.4967	1,307.2M	33.88
			<u>\$ 3,858.6M</u>	

Table XI-16

130

Commercial: Sales

High and Medium Defense Volume

	<u>Sample Commercial Sales</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial Sales Weightings</u>
<u>1966</u>				
High	#11,585.1M	.9239	\$12,539.4M	74.9
Med.	2,083.1M	.4967	4,194.0M	25.1
			<u>\$16,733.4M</u>	
<u>1965</u>				
High	\$ 9,864.8M	.9239	\$10,677.3M	77.1
Med.	1,577.5M	.4967	3,176.1M	22.9
			<u>\$13,853.4M</u>	
<u>1964</u>				
High	\$ 8,496.5M	.9239	\$ 9,196.4M	77.7
Med.	1,310.7M	.4967	2,638.7M	22.3
			<u>\$11,835.1M</u>	
<u>1963</u>				
High	\$ 7,275.4M	.9239	\$ 7,874.7M	74.5
Med.	1,335.8M	.4967	2,699.4M	25.5
			<u>\$10,564.1M</u>	
<u>1962</u>				
High	\$ 7,133.8M	.9239	\$ 7,721.4M	72.8
Med.	1,431.4M	.4967	2,881.9M	27.2
			<u>\$10,603.3M</u>	
<u>1961</u>				
High	\$ 6,870.9M	.9239	\$ 7,436.9M	73.7
Med.	1,318.8M	.4967	2,655.0M	26.3
			<u>\$10,091.9M</u>	
<u>1960</u>				
High	\$ 6,961.3M	.9239	\$ 7,534.7M	75.7
Med.	1,200.9M	.4967	2,417.7M	24.3
			<u>\$ 9,952.4M</u>	
<u>1959</u>				
High	\$ 5,823.7M	.9239	\$ 6,303.3M	73.9
Med.	1,106.3M	.4967	2,227.3M	26.1
			<u>\$ 8,530.6M</u>	
<u>1958</u>				
High	\$ 5,221.7M	.9239	\$ 5,651.8M	78.5
Med.	769.0M	.4967	1,548.2M	21.5
			<u>\$ 7,200.0M</u>	

Table XI-17

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Commercial: ECI

High and Medium Defense Volume

	<u>Sample Commercial ECI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial ECI Weightings</u>
1966				
High	\$ 4,126.8M	.9239	\$ 4,466.7M	81.3
Med.	510.3M	.4967	1,027.4M	18.7
			<u>\$ 5,494.1M</u>	
1965				
High	\$ 3,590.2M	.9239	\$ 3,885.9M	80.9
Med.	455.6M	.4967	917.2M	19.1
			<u>\$ 4,803.1M</u>	
1964				
High	\$ 3,143.3M	.9239	\$ 3,402.2M	83.5
Med.	333.1M	.4967	670.6M	16.5
			<u>\$ 4,072.8M</u>	
1963				
High	\$ 2,849.2M	.9239	\$ 3,083.9M	82.6
Med.	322.6M	.4967	649.4M	17.4
			<u>\$ 3,733.3M</u>	
1962				
High	\$ 2,684.5M	.9239	\$ 2,905.6M	82.1
Med.	314.3M	.4967	632.8M	17.9
			<u>\$ 3,538.4M</u>	
1961				
High	\$ 2,609.7M	.9239	\$ 2,824.7M	81.7
Med.	313.6M	.4967	631.3M	18.3
			<u>\$ 3,456.0M</u>	
1960				
High	\$ 2,769.1M	.9239	\$ 2,997.2M	85.8
Med.	245.9M	.4967	495.0M	14.2
			<u>\$ 3,492.2M</u>	
1959				
High	\$ 2,451.4M	.9239	\$ 2,653.3M	85.1
Med.	230.5M	.4967	464.0M	14.9
			<u>\$ 3,117.3M</u>	
1958				
High	\$ 2,188.6M	.9239	\$ 2,368.9M	88.6
Med.	151.9M	.4967	305.8M	11.4
			<u>\$ 2,674.7M</u>	

Table XI-18

132

Commercial: TCI

High and Medium Defense Volume

	<u>Sample Commercial TCI</u>	<u>% Population</u>	<u>Estimated Population</u>	<u>Commercial TCI Weightings</u>
<u>1966</u>				
High	\$ 5,692.2M	.9239	\$ 6,161.1M	81.9
Med.	675.6M	.4967	1,360.1M	18.1
			<u>\$ 7,521.2M</u>	
<u>1965</u>				
High	\$ 4,724.1M	.9239	\$ 5,113.2M	81.0
Med.	595.8M	.4967	1,199.5M	19.0
			<u>\$ 6,312.7M</u>	
<u>1964</u>				
High	\$ 4,103.6M	.9239	\$ 4,441.6M	84.4
Med.	406.6M	.4967	818.5M	15.6
			<u>\$ 5,260.1M</u>	
<u>1963</u>				
High	\$ 3,758.5M	.9239	\$ 4,068.1M	83.2
Med.	408.0M	.4967	821.5M	16.8
			<u>\$ 4,889.6M</u>	
<u>1962</u>				
High	\$ 3,449.2M	.9239	\$ 3,733.3M	82.2
Med.	400.7M	.4967	806.8M	17.8
			<u>\$ 4,540.1M</u>	
<u>1961</u>				
High	\$ 3,318.0M	.9239	\$ 3,591.3M	81.5
Med.	405.1M	.4967	815.6M	18.5
			<u>\$ 4,406.9M</u>	
<u>1960</u>				
High	\$ 3,516.9M	.9239	\$ 3,806.5M	85.3
Med.	326.2M	.4967	656.7M	14.7
			<u>\$ 4,463.2M</u>	
<u>1959</u>				
High	\$ 3,092.9M	.9239	\$ 3,347.6M	84.4
Med.	307.8M	.4967	619.6M	15.6
			<u>\$ 3,967.2M</u>	
<u>1958</u>				
High	\$ 2,775.3M	.9239	\$ 3,003.9M	87.2
Med.	218.1M	.4967	439.0M	12.8
			<u>\$ 3,442.9M</u>	

SECTION XII

POLICY IMPLEMENTATION LAG TIME

A considerable period of time is usually required for new DoD policy affecting profit to be reflected in the realized profit of defense industry. Implementation is a long and gradual process.

The weighted guidelines, for example, became mandatory 1 January 1964. The extent to which they have influenced the 1966 data of this report is very uncertain.

The following chart gives an estimate of the time required to see the effect of new policy. It shows DoD contract awards for calendar years 1964 and 1965. It also depicts actual expenditures against contracts awarded in those two years. Cumulative expenditures through 1965 amount to only 37.5% of the total amount of the awards. Profit realized by companies on the same contracts, as reflected in annual statements, is significantly less than 37.5% of the total profit realized, because expenditures include progress payments on fixed-price contracts. Expenditures generally occur prior to delivery, and sales and profit for fixed-price contracts are usually recorded at time of delivery.

CUMULATIVE % OF EXPENDITURES TO AWARDS

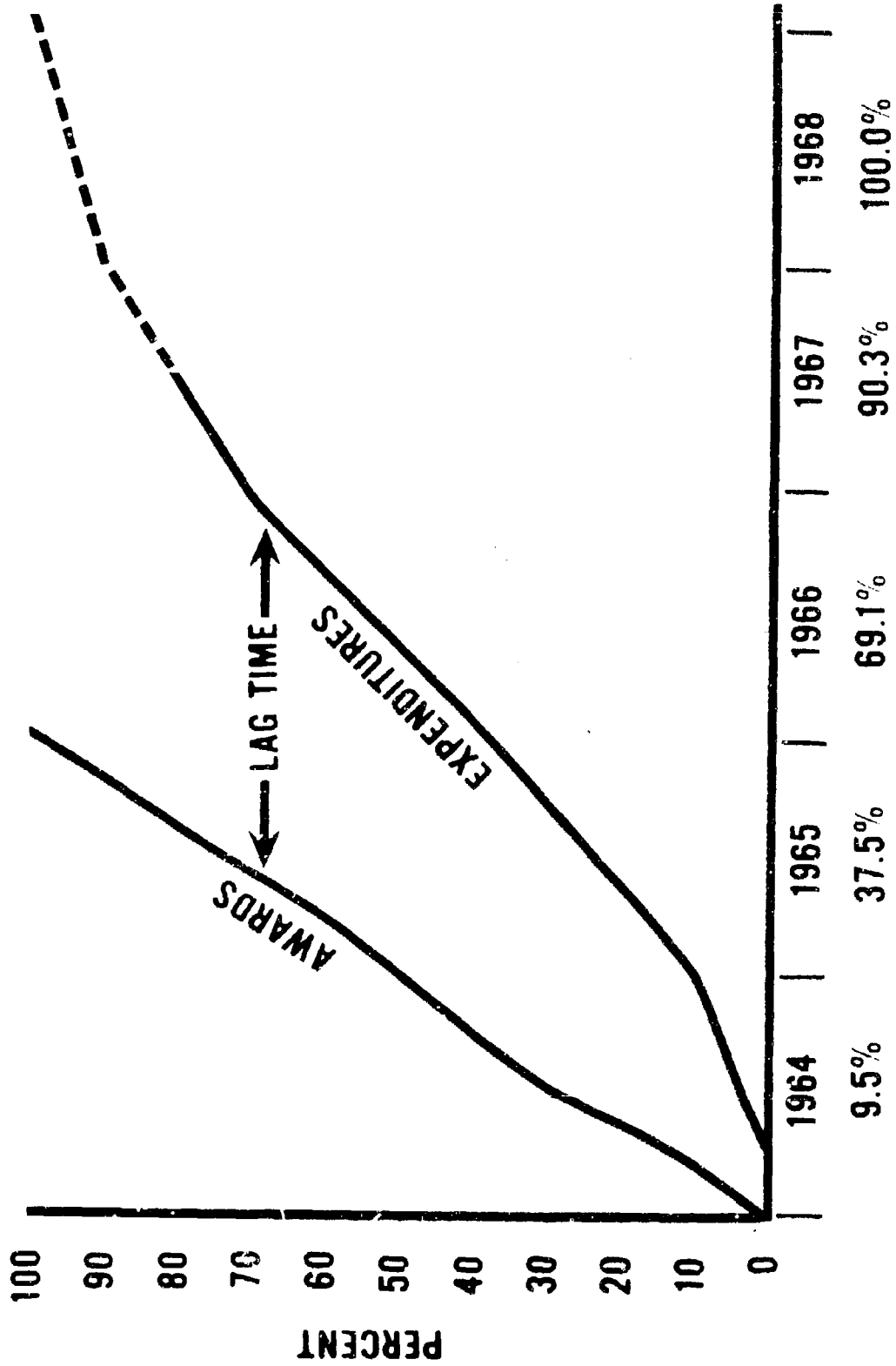


CHART XII-1

SECTION XIII

COMPARATIVE INDUSTRY (FTC-SEC) SAMPLE STATISTICS

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

The summary data in Table XIII-1 were used throughout this report for reflection of comparable FTC-SEC statistics.

¹See Paragraph D, Section IX for criteria for selection of the FTC-SEC Industrial Comparison Group.

COMPARATIVE INDUSTRY SAMPLE STATISTICS
(FTC-SEC QUARTERLY FINANCIAL REPORT)

\$ in Billions

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

Table XIII-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
Sales	\$37,816	42,544	37,061	42,183	44,760	43,961	51,634	56,387	60,328	69,333	74,616
ECI	\$12,853	13,767	14,336	15,332	16,483	17,223	18,633	20,190	21,508	23,459	25,267
ECI Turnover	2.9	3.1	2.6	2.8	2.7	2.6	2.8	2.8	2.8	2.95	2.95
TCI	\$14,353	15,550	16,292	17,378	18,852	19,799	21,198	22,849	24,202	26,304	29,082
TCI Turnover	2.6	2.7	2.3	2.5	2.4	2.2	2.4	2.5	2.5	2.6	2.6
Profit	3,579	3,925	2,311	3,892	3,850	3,592	5,440	6,090	6,257	7,873	7,033
% Profit/Sales	9.46	9.22	6.24	9.09	8.60	8.17	10.54	10.80	10.37	11.35	9.42
% Profit/ECI	27.84	28.51	16.12	25.38	23.36	20.86	29.20	30.15	29.09	33.56	27.83
% Profit/TCI	24.94	25.24	14.18	22.4	20.42	18.14	25.66	26.65	25.85	29.93	24.18

Table XIII-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
Sales	\$19,630	21,280	21,241	26,532	28,904	29,634	32,558	34,577	36,160	40,521	49,267
ECI	6,665	7,441	8,093	9,734	11,135	11,650	12,486	13,185	13,720	14,874	16,863
ECI Turnover	2.9	2.9	2.6	2.7	2.6	2.5	2.6	2.6	2.6	2.7	2.9
TCI	\$ 8,305	9,088	9,753	11,680	13,253	13,908	15,201	16,076	16,588	18,341	21,108
TCI Turnover	2.4	2.3	2.2	2.3	2.2	2.1	2.1	2.15	2.2	2.2	2.3
Profit	\$ 1,538	1,820	1,638	2,371	2,065	2,088	2,464	2,568	2,889	3,563	4,415
% Profit/Sales	7.83	8.55	7.71	8.94	7.14	7.04	7.56	7.43	7.99	8.79	8.96
% Profit/ECI	23.08	24.46	20.24	24.36	18.54	17.92	19.73	19.48	21.06	23.95	26.18
% Profit/TCI	18.52	20.03	16.79	20.30	15.58	15.01	16.21	15.97	17.42	19.43	20.92

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
Sales	\$28,085	29,066	25,276	26,023	25,790	25,709	28,959	30,468	34,621	40,411	48,020
ECI	\$12,222	13,496	13,429	13,163	13,282	13,816	14,762	14,964	16,478	18,385	21,425
ECI Turnover	2.3	2.2	1.9	2.0	1.9	1.7	2.0	2.0	2.1	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
TCI Turnover	1.9	1.8	1.6	1.6	1.6	1.6	1.6	1.7	1.8	1.8	1.85
Profit	\$ 3,062	2,831	1,978	2,502	2,078	2,163	2,623	2,891	3,858	4,652	5,601
% Profit/Sales	10.90	9.74	7.82	9.61	8.39	8.41	9.06	9.49	11.14	11.51	11.66
% Profit/ECI	25.05	20.98	14.73	19.01	16.28	14.65	17.77	19.32	23.41	25.30	26.14
% Profit/TCI	21.18	17.51	12.20	15.86	13.69	13.09	14.84	16.26	19.66	21.00	21.64

Table XIII-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
Sales	\$16,078	16,860	15,560	17,014	16,991	17,938	19,380	20,790	22,645	25,391	28,684
ECI	\$ 6,185	6,652	6,505	7,005	7,351	7,449	7,819	8,204	8,431	8,895	9,923
ECI Turnover	2.6	2.5	2.4	2.4	2.3	2.4	2.5	2.5	2.7	2.9	2.9
TCI	\$ 6,995	7,634	7,561	8,091	8,647	8,796	9,217	9,743	10,077	10,706	12,087
TCI Turnover	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.4	2.4
Profit	\$ 1,252	1,212	957	1,106	968	971	1,213	1,322	1,552	2,012	2,443
% Profit/Sales	7.79	7.19	6.15	6.50	5.11	5.41	6.26	6.36	6.85	7.92	8.52
% Profit/ECI	20.24	18.22	14.71	15.79	11.81	13.04	15.51	16.11	18.41	22.62	24.62
% Profit/TCI	17.9	15.88	12.66	13.67	10.04	11.04	13.16	13.57	15.40	18.79	20.21

Table XIII-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
Sales	\$ 4,141	4,398	4,336	4,817	5,317	5,660	6,229	6,489	6,918	9,001	11,287
ECI	\$ 2,017	2,157	2,257	2,487	2,825	3,022	3,114	3,274	3,587	4,585	5,322
ECI Turnover	2.1	2.0	1.9	1.9	1.9	1.9	2.0	2.0	1.9	2.0	2.1
TCI	\$ 2,299	2,462	2,569	2,797	3,212	3,421	3,540	3,782	4,198	5,288	6,217
TCI Turnover	1.8	1.8	1.7	1.7	1.7	1.7	1.8	1.7	1.6	1.7	1.8
Profit	\$ 502	509	476	629	625	617	739	777	928	1,419	1,961
% Profit/Sales	12.12	11.57	10.98	13.06	11.75	10.90	11.86	11.97	13.41	15.76	17.37
% Profit/ECI	24.89	23.60	21.09	25.29	22.12	20.42	23.73	23.73	25.87	30.95	36.85
% Profit/TCI	21.84	20.67	18.53	22.49	19.46	18.04	20.88	20.54	22.10	26.83	31.54

Table XIII-6

COMPARATIVE INDUSTRY SAMPLE STATISTICS BY DURABLE GOODS GROUPING
(FTC-SEC QUARTERLY FINANCIAL REPORT)

\$ in Millions

MISCELLANEOUS MANUFACTURING	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Sales	\$ 6,017	5,977	5,249	4,818	5,220	5,975	6,234	6,318	6,360	6,882	8,188
ECI	\$ 1,909	1,920	1,796	1,838	2,075	2,241	2,296	2,411	2,447	2,441	2,756
ECI Turnover	3.2	3.1	2.9	2.6	2.5	2.7	2.7	2.6	2.6	2.8	3.0
TCI	\$ 2,200	2,235	2,075	2,115	2,347	2,785	2,967	3,175	3,247	3,257	3,577
TCI Turnover	2.7	2.7	2.5	2.3	2.2	2.1	2.1	2.0	2.0	2.1	2.3
Profit	404	308	288	347	361	448	448	424	440	477	654
% Profit/Sales	6.71	5.15	5.49	7.20	6.92	7.50	7.19	6.71	6.92	6.93	7.99
% Profit/ECI	21.16	16.04	16.04	18.88	17.40	19.99	19.51	17.59	17.98	19.54	23.73
% Profit/TCI	18.36	13.78	13.88	16.41	15.38	16.09	15.10	13.35	13.55	14.64	18.28

APPENDIX A

FORM FOR OBTAINING FINANCIAL
INFORMATION FROM SAMPLE
COMPANIES

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SUMMARY OF DEFENSE INDUSTRY FINANCIAL DATA

	58	59	60	61	62	63	64	65	66
1. Total Sales									
a. Defense Sales									
Prime									
Subcontract									
b. Other Federal Government Sales									
(All U.S. Sales except DoD)									
c. *Other									
2. Equity Capital Investment									
3. Defense Equity Capital Investment									
4. Total Capital Investment									
5. Defense Total Capital Investment									
6. Total Profits									
a. Defense Profits									
Prime									
Subcontract									
b. Other Federal Government Profits									
(All U.S. Profits except DoD)									
c. *Other									
7. Unallowable/Nonrecoverable Costs									
8. Remarks (See Attachment E)									

*"Other" sales and profits are other than to an agency of the Federal Government, i.e., commercial sales, sales to local, state, and foreign governments; and sales to foreign governments under military aid programs if such sales are under contract with the foreign government.

Definitions

Data listed on the form should, to the extent feasible, be consistent with reports submitted to stockholders. Data should be prepared based on the Fiscal year or calendar year ending in the year indicated at the top of Attachment A in the columns provided.

1. Total Sales: State the total sales for the annual period ending in the year indicated on the form for the entire company operation. (Reference: Rule 5-03, Caption 1A.)*
 - a. Defense Sales: State the total sales of prime contracts and subcontracts of the Department of Defense for the same period involved as indicated in 1 above. Provide breakdown of prime contract and subcontract sales in spaces provided.
 - b. State the total sales of prime contracts and subcontracts of other Federal Government agencies.
 - c. State the balance of sales which should represent sales to commercial customers, state and local governments of the U.S. and sales to foreign governments.
2. Equity Capital Investment: Indicate the total dollars at the end of the fiscal period or calendar year involved which are assigned to capital shares and surplus. (Reference: Rule 5-02, Captions 34 and 35.)*
3. Defense Equity Capital Investment: Compute the pro rata share of item 2 for Department of Defense capital share and surplus dollars. Methods of allocation used for renegotiation purposes may be used on a pro rata basis for DoD business provided equitable apportionments result. In operations where Defense and other business are conducted with common assets, the capital allocated to Defense may be calculated on the basis of cost of sales.
4. Total Capital Investment: Add long-term debt to the amount stated in item 2 to arrive at total capital investment. (Reference: Rule 5-02, Captions 28, 29 and 30.)*
5. Defense Total Capital Investment: Compute the pro rata share of total long-term debt allocable to defense and add to item 3 to arrive at this amount. Methods of allocation used for renegotiation purposes may be used on a

*References are to Article 5, Regulation S-X of the Securities and Exchange Commission, where a more complete explanation will be found.

pro rata basis for DoD business provided equitable apportionments result. In operations where defense and other business are conducted with common assets, the capital allocated to defense may be calculated on the basis of cost of sales.

6. Total Profits: State the net income or loss before provision for federal taxes on income and before reduction of profits as a result of renegotiation. Any reduction of profits as a result of renegotiation must be added to the sum derived from Rule 5-04, Caption 14.*
 - a. Defense Profits: State the net income or loss on prime contracts and subcontracts of the Department of Defense before provision for federal taxes on income and before any reduction of profits as a result of renegotiation. This sum should be after deducting all disallowed or nonrecoverable costs under DoD cost principles which should be stated in item 7. Provide breakdown of prime contract and subcontract profits in spaces provided.
 - b. State the net income or loss on prime contracts and subcontracts of other federal government agencies on same basis as indicated in item 6a.
 - c. State the net income or loss on balance of business which should represent profits on commercial business, state and local governments in U.S. and foreign business.
7. Unallowable/nonrecoverable costs: State total costs which are not allowable under DoD cost principles, but are allocable to DoD prime contracts and subcontracts in accordance with generally accepted accounting practices in arriving at defense profits in item 6a.

*References are to Article 5, Regulation S-X of the Securities and Exchange Commission, where a more complete explanation will be found.

Instructions

1. State the total defense sales, and the total defense profits which should represent the totals of data included in Attachment C. Attachment C portrays the prime contract breakdown by type of contract. Calculate profit as percent of sales.
2. State the total defense sales, and the total defense profits which should represent the totals of data included in Attachment D. Attachment D portrays the subcontract breakdown by type of contract. Calculate profit as percent of sales.
3. Add prime contract and subcontract data to arrive at the total Department of Defense business for the entire company.
4. State the total defense sales and the total defense profits for all DoD prime contracts furnished by DoD for this category. These sums will have been already included in the prime contracts category above, and represent a sampling of contracts awarded on a basis of price competition.

SUMMARY OF DEFENSE INDUSTRY PROFITS BY TYPE OF DoD PRIME CONTRACT

[illegible]

REMARKS

It is requested that an analysis of the data provided on a voluntary basis on Attachments A, C and D be made in order to assure the use of representative company data for comparison of DoD business, other federal government business, and other business of the company. Provide narrative explanation with analysis to the extent needed. For example, renegotiation refunds and liabilities, major categories of disallowed costs, and pending overhead negotiations of major significance should be noted by year.

APPENDIX B

GUIDELINE FOR DISCUSSION WITH
SAMPLE COMPANIES

B-1

LOGISTICS MANAGEMENT INSTITUTE
4900 Massachusetts Avenue, N.W.
Washington, D.C. 20016
AC 202, 362-9833

PROFITS IN THE DEFENSE INDUSTRY

1. Company _____

2. Location _____

3. Person responding _____

4. Date completed _____

No. _____

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The objective of the Department of Defense Profit Study is to answer the following questions:

- What is the profitability of defense business?
- Why is defense business profitability what it is?
- What should defense business profitability be?
- What changes should be made in DoD policies and practices that affect profit?

The first question is being answered through analysis of 1958 through 1967 defense industry financial data. Defense industry's answers to the third question are being obtained through discussions with company management. Your information in the attached format will give us industry's answers to the second and fourth questions.

In responding, you are requested to report your opinions and conclusions, based on your company's experience. Those opinions and conclusions will not necessarily correspond to the predominant government or industry viewpoint.

No. _____

SECTION I: WHY IS DEFENSE BUSINESS PROFITABILITY WHAT IT IS?

This section is designed to obtain reasons for a) profit rate differences between commercial and defense business, and b) profit rate trends in defense business. The specific profit rate to be considered is profit/total capital investment.

Profit should be interpreted as profit before taxes. Defense business profit should be interpreted as profit after deduction of unallowable and nonrecoverable costs.¹ Total capital investment should be interpreted as equity capital investment plus long term debt.

A list of factors which may account for profit rate differences and trends is presented below. The factors are randomly ordered. You are not restricted to use of the factors listed, but are requested to review the list before completing Section I.²

If you believe that several factors are closely related and have the same impact on the profit rate, you may use them collectively as a single factor.

1. Bid and Proposal Expense
2. Security Costs
3. Component Breakout
4. DoD Make or Buy Policies

¹A breakdown of unallowable and nonrecoverable costs is requested on page 15.

²An additional copy of the list of factors is provided to facilitate completing Section I.

5. DoD Cost Analysis Practices
6. Restricted bidders' lists; defense as compared with commercial
7. Impact of factors other than price in award decisions; defense as compared with commercial
8. Use of Contractor Performance Evaluation
9. Defective Pricing Clause
10. Termination for Convenience
11. Changes Clause and effect on efficiency
12. Socio-economic contractual requirements (e.g., distressed labor areas, small business set-asides, Walsh-Healey, Buy American)
13. Disputes Clause
14. Certificates of Necessity
15. Selling expense differences; defense as compared with commercial
16. Patents, and Rights in Data
17. Trade Secrets
18. Leasing Practices
19. DoD Bargaining Power
20. Depreciation allowed (true depreciation)
21. General economic conditions
22. Unallowable and nonrecoverable costs*
(Including product development) (See page 15)
23. DoD administrative and technical controls
(after award of contract)
24. Incremental funding delays
25. Progress payments

No. _____

26. Non-reimbursed costs due to lack of contractual coverage
27. Government-furnished facilities, including tooling and test equipment
 - a. Investment advantage
 - b. Reduction in risk
 - c. Effect on efficiency
 - d. Delays
 - e. Administration
28. Delays in pricing changes
29. Differences in working capital requirements between commercial and defense business
30. Flexibility to change price
31. The practice of negotiating profit as a percent of cost or sales without regard for profit as a percent of capital employed
32. DoD cost analysis practices
33. Definitive pricing required too early in program's life cycle
34. Inaccuracies in estimating development contract cost
35. Accounting practice differences between commercial and defense business
36. Increased DoD emphasis on competition
37. Differences in negotiation practices between commercial and defense business
38. Product line pricing in commercial business
39. Statutory profit limitations
40. Renegotiation

No. _____

41. GAO activities
42. DoD audit activities
43. Corporate limitations on defense business profit
44. Change in defense business volume
45. Prime supplier bargaining power in commercial business
46. Extent of subcontracting
47. Difference in commercial and defense capital turnover
48. Income from installment sales financing
49. Inventory requirement
50. Market stability
51. Change in number of commercial business competitors
52. Change in number of defense business competitors
53. Severity of commercial business competition
54. Severity of defense business competition
55. Magnitude and duration of defense programs
56. Use of two-step formal advertising in defense procurement
57. Change in the relative amount of CPFF defense business
58. Change in the relative amount of CPIF defense business
59. Change in the relative amount of FPI defense business
60. Change in the relative amount of FFP defense business
61. Wider fee (or profit) swing in incentive contracts
62. Increased use of schedule and performance incentives in contracts

No. _____

63. Change in the relative amount of FPR defense business
64. Change in the relative amount of defense business covered by letter contracts
65. Use of multi-year defense procurement
66. Use of total package defense procurement
67. Use of contract definition
68. Use of the Weighted Guidelines method
69. Difference in use of escalator clauses in commercial and defense business
70. Government-guaranteed loans (including V-loans)
71. Government-furnished material
 - a. Investment advantage
 - b. Effect on Efficiency
 - c. Delays
 - d. Administration
72. Poor Project Cost Control
73. Non-allowance of all prior year R&D costs in pricing products to the Government
74. Poor Price Estimating
75. Entering a somewhat different business in which the necessary competencies were lacking
76. Lack of use of the Weighted Guidelines method
77. Shift of power from contracting office to audit and cost analysis
78. Efficiency and economy of operations
79. Inadequate profit objectives
80. Cost sharing devices

No. _____

In responding to 1, 2, and 3 below, it is requested that you identify, in order of importance, at least five factors or groups of factors. The factors you identify are expected to represent the predominant influences on differences and trends in profit/total capital investment. Brief explanations of your response would be appreciated.

Factors (see pages 3 through 7) may be identified by their associated numbers. Closely related factors may be grouped if necessary or desirable.

No. _____

1. The following factors or groups of factors, in order of importance, are primarily responsible for our defense business profitability being (greater) (less) than our commercial business profitability. (Underline greater or less, whichever is appropriate.)

1)

2)

3)

4)

5)

No. _____

2. The following factors or groups of factors, in order of importance, have had the greatest positive influence on the trend in our defense business profitability over the last five years.

1) _____

2) _____

3) _____

4) _____

5) _____

No. _____

3. The following factors or groups of factors, in order of importance, have had the greatest negative influence on the trend in our defense business profitability over the last five years.

1)

2)

3)

4)

5)

No. _____

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There is no text or other markings on the paper.

No. _____

*Note on Unallowable and Nonrecoverable Costs

Please provide an estimated percentage breakdown of your company's unallowable and nonrecoverable costs on government contracts, based on your Fiscal Years 1965 and 1966 experience (as a % of sales).

FY 1965 Interest

Independent Research and Development:

In excess of ceiling in IR&D
agreements

Cost sharing contracts

Product and technical develop-
ment not related to current
contracts or IR&D agreements

Other

Contributions and Donations

Other

Total

FY 1966 Interest

Independent Research and Development:

In excess of ceiling in IR&D
agreements

Cost sharing contracts

Product and technical develop-
ment not related to current
contracts or IR&D agreements

Other

Contributions and Donations

Other

Total

APPENDIX C

FORMAT OF OBTAINED
SAMPLE COMPANY OPINIONS

LOGISTICS MANAGEMENT INSTITUTE
Washington, D.C.

GUIDELINE FOR DISCUSSION RELATIVE TO
INDUSTRY OPINIONS ON PROFITS IN THE
DEFENSE INDUSTRY

The purpose of this discussion is to obtain:

- 1) Reasons for the various profit differences between defense business and commercial business.
- 2) Reasons for the profit performance of various defense contractors in relation to the changing pattern of procurement policies and practices.
- 3) Your defense profit objectives and suggestions for achieving those objectives.
- 4) Assist, as necessary, in the completion of the format previously sent out, and to obtain a copy of the completed format.

No. _____

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LOGISTICS MANAGEMENT INSTITUTE

Washington, D.C.

PROFITS IN THE DEFENSE INDUSTRY

1. Company Contacted _____

2. Location _____

3. Personnel Interviewed _____

4. Interviewer _____
5. Date of Interview _____
6. Has company agreed to complete Part II?
Yes _____ No _____
7. If "Yes" to 6, above, when may Part II be expected?

A. Compare Commercial and Defense Business.

- 1) Are your defense products comparable to your commercial products? Yes _____ No _____
- 2) Are your defense products produced in the same burden center as your commercial products?
Yes _____ No _____
- 3) For comparable products, are your defense profits
Higher _____ Lower _____ The same _____
- 4) Where possible, indicate the rates of profit which you attempt to realize (profit objective) for the following:
 - a) Defense Sales _____
 - b) Commercial Sales _____
 - c) Defense Total Investment _____ Equity Investment _____
 - d) Commercial Total Investment _____ Equity Investment _____
- 5) What are the major reasons for the differences between your profit objectives and your realized profits?

B. Competition in Defense Business.

- 1) Is your defense business as competitive as your commercial business? a) Yes _____ b) No _____

Why _____

No. _____

- 2) Do you realize lower profits in competitive than for noncompetitive defense procurements?

Yes _____ No _____

- 3) If the answer is "yes," list the reasons for lower profits on defense competitive procurements in order of significance.

- a) Severity of competition
- b) Lower profit objectives
- c) Higher degree of unpriced risks
- d) Buy-in practices
- e) Inadequacy of government specifications
- f) Other

- 4) Do you think "buy-in" practices, as defined in ASPR 1-311* should be discouraged

On Cost type business?

On FP business?

Competitive Noncompetitive

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

- 5) Would you be in favor of a Defense policy that would highlight suspected "buy-in" and exclude such procurements from a company's renegotiation base?

On Cost type business?

On FP business?

Competitive Noncompetitive

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

- 6) Would you be in favor of a Defense policy that would require certification from defense companies which assures Defense that "buy-in" has not been employed?

On Cost type business?

On FP business?

Competitive Noncompetitive

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

- a) Yes _____
- b) No _____

*Bidding less than cost on a particular contract

No. _____

7) Should bidding less than cost for a specific contract be allowed when:

a) A company is faced with the need for putting work in idle facilities -

On Cost type business?

On FP business?

Competitive

Noncompetitive

a) Yes _____

a) Yes _____

a) Yes _____

b) No _____

b) No _____

b) No _____

b) A necessity exists for absorbing fixed costs?

On Cost type business?

On FP business?

Competitive

Noncompetitive

a) Yes _____

a) Yes _____

a) Yes _____

b) No _____

b) No _____

b) No _____

c) A company projects further defense work that appears to make this a sound management decision?

On Cost type business?

On FP business?

Competitive

Noncompetitive

a) Yes _____

a) Yes _____

a) Yes _____

b) No _____

b) No _____

b) No _____

d) A company projects further commercial work than appears to make this a sound management decision?

On Cost type business?

On FP business?

Competitive

Noncompetitive

a) Yes _____

a) Yes _____

a) Yes _____

b) No _____

b) No _____

b) No _____

e) Proposing a plan to recover in accordance with ASPR 3-813 (Pre-Production, Start Up and other non-recurring costs)?

On Cost type business?

On FP business?

Competitive

Noncompetitive

a) Yes _____

a) Yes _____

a) Yes _____

b) No _____

b) No _____

b) No _____

No. _____

8) Does the Government ever cause buy in?

Yes _____ No _____

If "Yes," explain. _____

9) Have you entered into cost-sharing contracts?

Yes _____ No _____

If "Yes," explain. _____

10) Have you experienced any loss of commercial profits due to supplying government agencies?

Yes _____ No _____

11) If so, indicate reasons in order of significance.

- a) Dispersion of know-how or proprietary information
- b) Diversion of key personnel
- c) Diversion of facilities
- d) Inability to accept commercial business
- e) Other

No. _____

- 12) Have your defense profits been adversely affected as a result of decisions or actions within your organization, i.e., poor estimating, poor program selection, entering an area of business for which you lacked the required competencies, etc.?

a) Yes _____ b) No _____

- 13) If "Yes" to what degree were profits affected? _____
Please explain in as much detail as possible. _____

- 14) Do you believe that you ever accept negotiated target profits that may be less than the customer is willing to negotiate?

a) Yes _____ b) No _____

- 15) If "Yes" please explain. _____

- 16) Are you satisfied with your firm fixed-price profits as compared with your profits on other types of contracts?

a) Yes _____ b) No _____

If "No" what caused your realized profit performance on firm fixed-price contracts?

No. _____

- 17) Are you satisfied with your realized fixed-price competitive profits?

a) Yes _____ b) No _____

If "No" what caused your realized profit performance on such contracts?

- 18) Are you in favor of Multi-Year Procurement?

a) Yes _____ b) No _____ c) List reasons

- 19) Are you in favor of Life Cycle Cost Procurement?

a) Yes _____ b) No _____ c) List reasons

No. _____

20) Do you prefer to perform defense business as a sub-contractor or as a prime contractor?

- a) Subcontractor _____
- b) Prime Contractor _____
- c) List reasons for preference

C. Attractiveness of Defense Business

1) Are your long-range plans to increase or reduce defense business as a percentage of the overall company volume?

- a) Increase _____ or reduce _____

2) If plan is to reduce defense percentage, rank the following reasons in order of their influence on the plan:

- a) Shifting of risk from Government to Contractor
- b) Non-government sector of economy growing more rapidly than government sector
- c) Greater stability for work forces
- d) Diversity in employment
- e) Increased profit potential in commercial business
- f) Other, and Remarks

No. _____

D. Profit Criteria

- 1) Are you in favor of the Weighted Guidelines profit policy (ASPR 3-808)?
Yes _____ No _____
- 2) Do you believe the Weighted Guidelines are causing you to experience a wider range of negotiated target profits?
a) Yes _____ b) No _____
- 3) Are the Weighted Guidelines resulting in higher negotiated average profits?
a) Yes _____ b) No _____
- 4) Do you believe the Weighted Guidelines are being used by DoD to recognize
a) More effective contract performance.
Yes _____ No _____
b) Risk.
Yes _____ No _____
c) Higher skills.
Yes _____ No _____
- 5) Are the Weighted Guidelines encouraging you to supply your own facilities and financing?
a) Yes _____ b) No _____
- 6) Are other Defense policies encouraging you to supply your own facilities?
a) Yes _____ b) No _____
- 7) Should there be greater emphasis in the Weighted Guidelines for contractors' total investment as a profit criteria?
a) Yes _____ b) No _____
No. _____

- 8) Should the Weighted Guidelines give consideration to contractors' total volume of business as related to his total investment in defense business, i.e., investment turnover? If "yes"

Why? _____

- 9) How can the present Weighted Guidelines be improved?

a) _____

b) _____

c) _____

d) _____

e) _____

No. _____

- 10) What other suggestions do you have for establishing sounder Defense policies as related to profits in defense business?

a) _____

b) _____

c) _____

d) _____

e) _____

E. What should defense profitability be?

- 1) From a management viewpoint, is defense business more or less complex than commercial business? i.e., does defense business require more or less management attention:

More _____
less _____
Same _____

No. _____

- 2) Are financial risks in doing defense business greater or less than in commercial business?

Greater _____
Less _____
Same _____

If greater, explain. _____

- 3) Do you have a commercial carry-over benefit as a result of doing defense business?

Yes _____ No _____

- 4) Do you have a defense carry-over benefit as a result of doing commercial business?

Yes _____ No _____

- 5) Should Profits/TCT on defense be higher _____, lower _____, about the same _____ when compared with commercial business?

- 6) Depending on answer to 5), above, how much higher _____, lower _____ should defense profits be? _____*

*Express both as Profit/Sales, and Profit/TCT if possible.

No. _____

Person conducting interview should explain entries on the preceding page, (E. WHAT SHOULD DEFENSE PROFITABILITY BE?), highlighting key elements in each factor. Discussion of risk might include such items as market stability (including termination for convenience), contract type, provision for bad debts, certificates of necessity and true depreciation, inventory losses, loss of trade secrets, renegotiation, defective pricing clause, early price commitment, and flexibility to change prices. Discussion of carry-over benefits might include such items as absorption of overhead, product development cost absorption, volume effect on efficiency (including learning curve), and transfer of knowledge. Discussion of relative complexity might include such items as administrative procedures (including cost analysis, audit, subcontract approval), administrative and technical controls, marketing procedures, socio-economic terms and conditions, disputes clause, congressional hearings and GAO studies, and delays.

No. _____

APPENDIX D

CHARTS SHOWING RESULTS OF INTERVIEWS
WITH SAMPLE COMPANIES

This appendix is a compilation of contractors' answers to the questions asked in Appendix B. Contractors were asked to list five reasons in order of import. In a number of instances, two or more, interrelated reasons were listed as item 1, 2 or more as item 2, etc. The points listed result from giving weighting of five to all reasons listed as item 1. A weighting of four to all reasons listed as item 2, etc.

WHY IS DEFENSE BUSINESS PROFITABILITY WHAT IT IS?

Factors having greatest negative influence on defense profit trends over the last five years. In order of importance:

<u>Description of Factors</u>	<u>Points</u>
● Increased DoD emphasis on competition	71
● DoD cost analysis practices and audit activities	68
● Poor company estimating, often developmental items--early definitive pricing--inability to recoup	53
● Unallowable/nonrecoverable costs	42
● Changes in relative amount of FFP business	39
● Lack of contractual coverage	35
● DoD administrative and technical controls	33
● DoD bargaining power	28
● Bid and proposal costs	23
● Magnitude and duration of defense programs	21
● Use of total package procurement	17
● Use of multi-year defense procurement	16
● Change in defense business volume	15
● Progress payments (shift from cost to FP contracts)	15
● Use of contract definition	15
● GAO activities	13
● Cost-sharing devices by DoD	10

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Factors having greatest positive (increase) influence on defense profit trends over the last five years. In order of importance:

<u>Description of Factors</u>	<u>Points</u>
● Use of the weighted guidelines method	53
● Increased use of scheduling and performance incentives in contracts	34
● Wider fee (or profit) swing in incentive contracts	28
● Change in the relative amount of CPIF defense business	23
● Change in defense business volume	22
● Change in the relative amount of FPI defense business	17
● Change in the relative amount of FFP defense business	14
● Magnitude and duration of defense programs	12
● General economic conditions	11
● Change in the relative amount of CPFF defense business	10

WHAT SHOULD DEFENSE PROFITS BE?

- Is defense business more complex to manage than commercial business?

Yes - 18 No - 0 Same - 5

- Are financial risks in doing defense business greater than in doing commercial?

Greater - 12 Less - 3 Same - 5

- Do you have commercial carry-over from defense business?

Yes - 9 No - 13

- Do you have defense carry-over from commercial business?

Yes - 9 No - 12

- Available pre-tax profit objectives:

	<u>Unweighted Averages</u>	<u>Ranges</u>
Defense sales	10.40%	7.0 to 20.0%
Commercial sales	16.94	9.0 to 27.5
Defense TCI	26.44	18.0 to 40.0
Commercial TCI	32.14	20.0 to 50.0

- Should defense business profits to TCI be higher, lower, or the same when compared to commercial business?

Higher - 0 Lower - 5 Same - 18

- Lower: 5 to 15% lower than commercial due to:

- Less financial risk particularly on government R&D
- Public obligation not to make more money on public funds; however, in comparable competitive situations, product profits should be the same.

WHAT CHANGES SHOULD BE MADE IN DoD POLICIES
AND PRACTICES THAT AFFECT PROFITS?

- Continuous program to insure that profit motive is defined as a DoD goal and understood by negotiators and related persons and applied at the working level.
- Increased and improved use of WGL at working level.
- Elimination of unproductive and costly cost analysis and audit activities, particularly redefining the exact role of the auditor.
- Liberalization of unallowable costs, particularly (1) in IR&D, and (2) under ASPR, Section XV.
- More timely contractual coverage, followed by stepped-up funding and progress payments.
- Redefined use of cost vs. FP competitive type contracts, ending present overemphasis on FP competitive type--particularly on developmental programs.
- Increased use of escalation clauses where legitimately needed--development contracts, long-term contracts and drastic economic change.
- Use of learning curves in selected multi-year procurements.
- Award original developer first production contract--prove data.

- Improve Weighted Guidelines to:

- 1) Continuously assure sound understanding and implementation of DoD WGL policy at the negotiation level and first level of management.
- 2) Give greater consideration to volume and investment.
- 3) Give greater negative weight to government-owned facilities.
- 4) Give greater consideration of contract ceiling amounts, as well as target profit.
- 5) Recognize and allow for contingencies in cost area.
- 6) Permit and encourage two-way communication between government and contractors on elements of WGLs.

WEIGHTED GUIDELINES

	<u>Yes</u>	<u>No</u>
Are you in favor of the Weighted Guidelines Policy in ASPR 3-808?	23	0
Are the WGLs causing you to experience a wider range of negotiated target profits?	11	10
Are the WGLs resulting in higher average negotiated profits?	17	5
Are the WGLs being used to recognize:		
1) More effective contract performance	7	16
2) Risks?	16	5
3) Higher Skills?	15	6
Do the WGLs encourage you to supply your own facilities?	0	23
Should there be greater emphasis in the WGLs on contractors' total investment as a negotiated target profit criteria?	23	0
Should the WGLs consider total volume of defense business as related to total investment in defense business, i.e., investment turnover?	21	2

GENERAL

CHANGES IN DEFENSE/COMMERCIAL SALES MIX

- Long-range plans of companies to increase or reduce their percentage of defense business with reasons therefor:

Increase - 5 Reduce - 18

No contractors plan to get out of the defense business.

- Reasons for reduction:
 - Increased profit potential in commercial business
 - Non-defense sector of economy growing more rapidly
 - Greater stability in work force
 - Shifting risk from government to contractor
 - Product diversification

Defense/Commercial Competition

Twenty-one of 23 companies said their defense business is more competitive than their commercial business for the following reasons:

- Severity of competition
- Higher degree of unpriced risks
- Lower profit objectives
- Inadequate specifications
- Buy-in
- Overcapacity in some product lines
- Government bargaining position

Prime vs. Subcontract defense business

Nineteen of 22 contractors preferred to do business as prime contractors rather than as subs. Their reasons were:

- Primes harder on subs than Government is on primes
- Subs get all the problems of the primes plus others initiated by the primes
- Better planning possible as a prime
- Fear of prime stealing sub's technical products

Buy-In

- Should the Government do more to discourage "buy-in"?
 - All companies said that buy-in should be discouraged on cost type business.
 - Fourteen of 23 companies said that buy-in should be discouraged on FP competitive business.
- Should bidding less than cost be allowed when:
 - A necessity exists for absorbing fixed costs, e.g., a company needs work in idle facilities.

	<u>Yes</u>	<u>No</u>
CPFF	8	14
FP, Competitive	21	2
FP, Non-Competitive	19	4

- A company projects further commercial/defense work that appears to make this a sound management decision.

	<u>Yes</u>	<u>No</u>
CPFF	9	13
FP, Competitive	20	3
FP, Non-Competitive	19	4

- A company includes a plan for future recovery of costs as a part of its proposal?

	<u>Yes</u>	<u>No</u>
CPFF	16	6
FP, Competitive	22	0
FP, Non-Competitive	22	0

Defense Procurement

Nineteen of 23 contractors were in favor of greater application of MYP competition on proven items but believed learning curve consideration necessary.

All contractors were in favor of sound application of LCC in making competitive awards, but believed the Government must solve the problems involved in developing useful projection information for such items as maintenance and reliability in order to make LCC decisions.