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Report to the Co-Chairman, Military Reform Caucus, House of Representatives

September 1990

GOVERNMENT CONTRACTING

Financial Measures for Evaluating Contractor Profitability

GAO/NSIAD-90-200BR

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-236689

September 12, 1990

The Honorable Barbara Boxer
Co-Chairman, Military Reform Caucus
House of Representatives

Dear Madam Co-Chairman:

This report responds to your request that we report on the types of financial measures that could be used to assess the effect that federal government policies may have on the profitability of government contractors.

In our report,[1] we recommended a framework for a profit reporting program that would require major government contractors to annually report financial data to the government to provide a basis for evaluating profitability. Such a program has not been implemented and financial data is not publicly available for the specific part(s)—i.e., the segment level—of a company performing government work. Therefore, the framework of data for measuring profitability is not in place. Consequently, our analysis reflected in this report is not a government contractor profitability study nor was it intended to be.

Results in Brief

A profit reporting program which requires major government contractors to annually report financial results for the part(s) of the company performing government work is a prerequisite to any evaluation of government contractor profitability.

Return on assets (ROA), which is the ratio of income to assets, should be used as the principal financial measure to use in assessing the profitability of government contractors. ROA is the desirable measure of profitability because it can (1) provide a basis for measuring the cumulative impact of policies, (2) be computed at the segment level, and (3) be derived from historical financial data which can be audited.

The defense industry has objected to using ROA as the preferred financial measure to evaluate contractor profitability. The primary objection centers on the method that we used and a 1976 Department of Defense

[1] Government Contracting: A Proposal for a Program to Study the Profitability of Government Contractors (GAO/NSIAD-87-175, Sept. 1987).

(DOD) study used to compute ROA. Using this method resulted in a substantially higher profitability for defense contractors than non-defense contractors from 1980 to 1983. As part of the debate, the industry posed the question: If the defense industry's ROAs are so high, why have their price earnings (PE) ratios been historically low? Based on our research of the literature on financial measures, interviews with financial analysts, and analyses of balance sheet and income statement information for companies in Standard and Poors' (S&P) Industrial Index and for companies that perform defense work, we found that PE is not a good indicator of profitability.

If segment-level data were available, a combination of several measures of financing defense contract work could be used, along with ROA, to assess the effect that government policies have on government contractors.

ROA and PE Ratios Do Not Move in Tandem

PE is the ratio of stock price to earnings per share. The PE ratio is not an appropriate indicator of financial performance for the part of the company that performs defense work because PE is not computed at the segment level. Furthermore, the PE ratio is better suited to measure stock market expectations than to measure current profitability.

Companies that do varying amounts of defense work have generally had lower PE ratios than overall industrial norms. This has generally been true even when the profitability on defense work has increased. In fact, it is not just defense contractors that experience lower PE ratios when profitability increases; this situation usually exists for the S&P Industrial Index.

The fact that PE ratios and ROA do not move in tandem is not unexpected, given the nature of these financial measures. ROA is a profitability measure based on actual financial performance over the previous year. PE ratios are based partly on expected future earnings, risk, and growth prospects.

Other Financial Measures

Financial measures other than ROA, while not suitable as overall profitability measures, can be used to provide additional insight into the effect of individual government policies. For example, data to measure such things as capital expenditures ratios and research and development ratios can be identified in the financial records of a company.

A capital expenditures ratio can reflect the amount spent on assets relative to sales. Some government profit policies are designed to encourage contractors to invest in new plant facilities and equipment. Computing the capital expenditures ratio for government contractors could indicate whether government policies are accomplishing this objective.

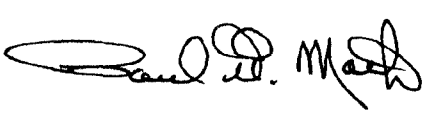
A research and development ratio can show the research and development expenses that are not reimbursed by the government. This measure could be used to examine the degree to which government contractors are required to expend non-recoverable funds for research and development.

Appendix I provides further details on the financial measures we identified and the work we did to illustrate the types of analyses that could be done if segment-level data were available. It was not within the scope of this report to address the standards for determining whether government contractor profitability is at an appropriate level. As part of an ongoing assignment, we intend to evaluate the criteria that should be used when comparing government contractor profitability. Appendix II provides additional information on our scope and methodology.

We have provided briefings on these financial measures to DOD, the Office of Federal Procurement Policy, Financial Analysis Methodology Committee, the Procurement Round Table, and interested congressional committees. As requested, we did not obtain official comments on a draft of this report from DOD.

Please contact me at (202) 275-8400 if you or your staff have any questions concerning this briefing report. Major contributors to this briefing report are listed in appendix III.

Sincerely yours,



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Issues

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Abbreviations

DFAIR	Defense Financial and Investment Review
DOD	Department of Defense
PE	price earnings
R&D	research and development
ROA	return on assets
ROE	return on equity
ROI	return on investment
S&P	Standard and Poors

What Are the Most Appropriate Financial Measures of Contractor Profitability?

Background

In the last 14 years, DOD has issued two studies on the defense industry's profitability, entitled Profit 76 and the Defense Financial and Investment Review (DFAIR). These studies have used ROA as a principal financial measure. These studies compared defense profitability with durable goods manufacturers. In conducting these studies, DOD contracted with a Certified Public Accounting firm to collect and analyze financial data at the segment level for firms performing defense work.[1]

After the DFAIR results were published, the defense industry objected to the methodology that we used in our 1986 study[2] and that DOD used in its 1976 study to compute ROA. This methodology[3] resulted in a substantially higher profitability for defense contractors than non-defense contractors from 1980 to 1983.

In our 1987 report, we recommended that the government develop a systematic method for measuring the profitability of government contractors. We recommended that financial data be collected, on an ongoing basis, at the segment level and that ROA be used as the principal measure of profitability.

In 1987, the Procurement Round Table (a group that reviews government procurement issues) strongly reaffirmed the importance of a program of regular review and research into government profit policies. Noting the differences in approach and methodology for evaluating contractor profitability, it recommended that the most appropriate measures of contractor profitability at the segment and firm level be determined. It also recommended that the following issues be addressed before mandating the creation of our proposed profitability reporting program:

- "What is the most appropriate standard against which to evaluate the adequacy of industry profits . . . ?"

[1]DOD's most recent study, called DFAIR, was issued in 1985. This study used segment-level data (covering the period 1970-83) to describe the financial performance of the defense industry. This type of data on the defense industry has not been collected for the last 7 years, despite the rapidly changing defense economic environment.

[2]Government Contracting: Assessment of the Study of Defense Contractor Profitability (GAO/NSIAD-87-50, Dec. 23, 1986).

[3]In calculating ROA, DFAIR increased the asset base by adding progress payments to contractor inventories. In an additional computation, DFAIR adjusted income by using a unique method to calculate "economic profit." These two actions reduced the apparent ROA for defense business and led, in our opinion, to an understatement of defense contractor profitability.

- "Is it desirable to adjust or modify data in order to secure comparability of results between major government contractors and commercial operations?"
- "What are the most appropriate measures of economic risk, and by what standards should risk be evaluated?"

We believe this briefing report identifies several appropriate measures for assessing contractor profitability at the segment and firm level. The remaining issues, described above, address the standards for evaluating whether government contractors' profitability is at an appropriate level. We recognize the importance of assessing economic risk in determining the appropriate level of government contractor profitability. As part of an ongoing assignment, requested by the Military Reform Caucus, we intend to evaluate the criteria that should be used when comparing government contractor profitability.

Opponents to our 1987 proposal for establishing a profitability reporting program believed that profitability studies should be delayed pending resolution of the best measures to use in studying contractor profitability. As a result, the Congress requested that DOD and the Office of Federal Procurement Policy establish the Financial Analysis Methodology Committee to recommend a financial analyses methodology for measuring contractor profitability.

This report is not intended to be a study of the profitability of government contractors. Without segment data, such as that used in DFAIR, we have no available data that can allow such a study. Rather, this study is intended to emphasize the importance of evaluating government contractors using a variety of financial measures.

To illustrate the types of analyses that could be done with the financial measure we identified, we used data for two groups of companies to hypothetically represent (1) government contractors and (2) U.S. industry. These illustrative analyses simply show how information on government contractors could be used to provide indications of the impact of government policies on government contractors, if segment-level data on government contractors were available.

There is no universally agreed upon definition of what constitutes the defense industry. To illustrate measurement methodology, we identified 110 firms that accounted for about 60 percent of the total dollar value of prime contracts awarded by DOD between 1971 and 1988. We used firm-level data for the companies we identified. The usefulness of the

data in describing the financial health of government contractors is limited because it is not specific to the defense part of the company.

To hypothetically represent U.S. industry, we used the S&P Industrial Index. Appendix II provides additional details on our objectives, scope, and methodology.

Industry Compares Its Relatively High Profitability With Its Low PE Ratios

The defense industry has objected to using ROA as the preferred financial measure to evaluate contractor profitability. As part of the debate, the industry posed the question: If the defense industry's ROAs are so high, why have their PE ratios been historically low?

We found that 110 selected companies that do defense work have generally had lower PE ratios than overall industrial norms over 18 years (1971-88). This has generally been true even when ROAs for many firms performing defense work have increased. In fact, it is not just defense contractors that experience low PE ratios when profitability increases, this situation also exists for companies included in the S&P Industrial Index.

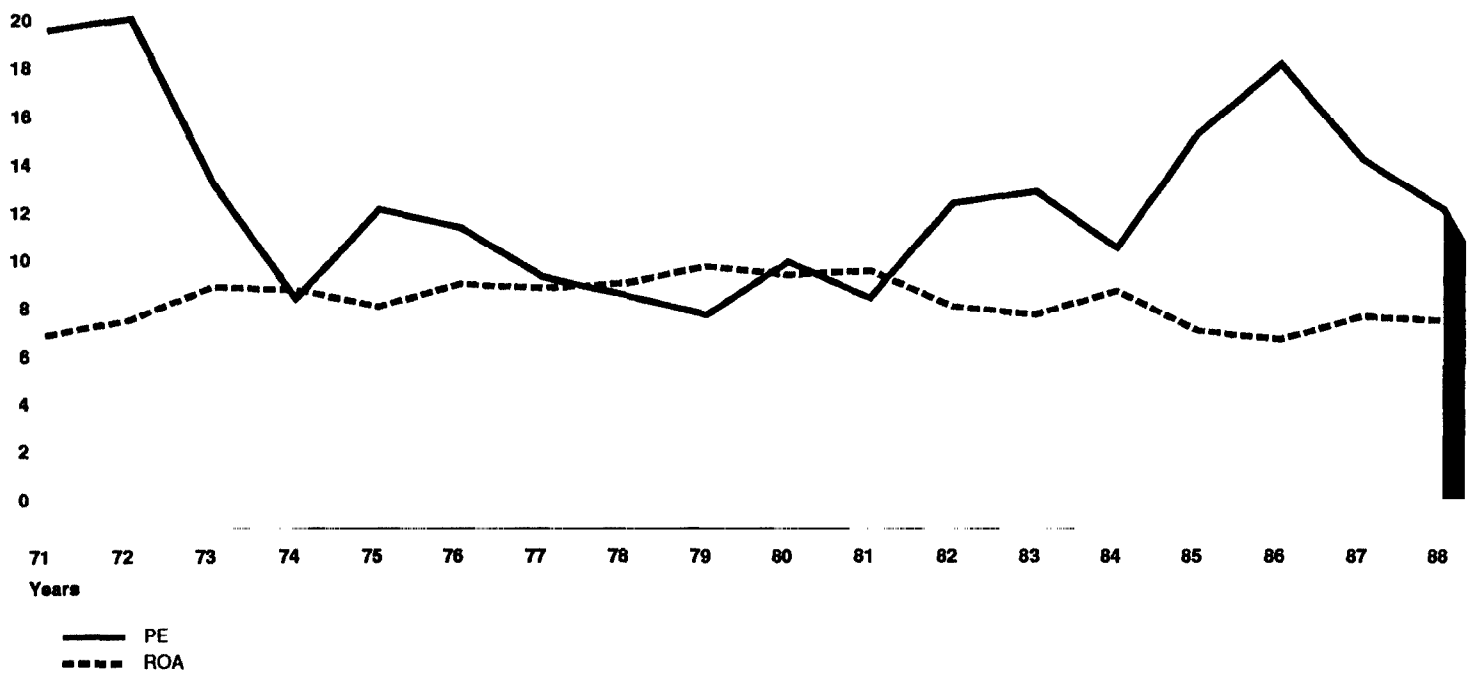
Figure I.1 shows the PE ratios for the S&P Industrial Index as being lower when profitability levels are high. In fact, the PE ratio and ROA are strongly negatively correlated.[4] In other words, when PE ratios are low, ROA levels are high, and vice versa.

Although PE ratios and ROA do not move in tandem, this is not unexpected, given the nature of these financial measures. ROA is a profitability measure based on actual financial performance over the past year. PE ratios are based, in part, on expected future earnings.

PE ratios are computed for the overall firm, therefore, their usefulness in describing the part of the company that performs defense work is limited. Since there are very few companies that perform solely defense work and since a PE ratio is only computed at the firm level, using PE ratios to describe the financial health of defense contractors is of limited use.

[4]The correlation coefficient was 0.8561.

Figure I.1: PE and ROA for S&P Industrials



Significance of a Low PE Ratio

A low PE ratio does have significance. It may contribute to a higher cost of capital. The cost of capital is what a corporation must pay for its debt and equity financing. Financial theory requires that a company's return on investment (ROI) should be related to its cost of capital.

Our analyses indicated that companies doing defense work have generally had lower PE ratios than the S&P Industrial Index over the last 18 years. However, the low PE ratios cannot for the entire 110 companies, be attributed directly to their defense contracts. If a low PE ratio contributes to a firm's higher average cost of capital, that could be an indication that the firm may need to earn a higher ROA to cover its cost of capital. We intend to explore the relationship between the cost of capital and ROI as part of an ongoing assignment.

Analyses of Selected Financial Measures

While not suitable as overall profitability measures, financial measures other than ROA can be used for examining the effect of various government policies on some aspects of firm performance or segment-level performance. These other measures include capital expenditures ratios, research and development (R&D) ratios, liquidity ratios, and debt management ratios.

Our analyses are not intended to be a study of government contractor profitability. They are merely intended to show the type of analyses that could be made in assessing the financial health of government contractors. Since our analyses used firm-level data, the usefulness of the data in describing the financial health of government contractors is limited because it does not isolate the defense part of the companies. Nevertheless, the firm-level data used in this report shows the type of analyses that could be done if segment-level data on government contractors were made available.

Segment-Level Financial Measures

Financial measures such as capital expenditures ratios and R&D ratios can be identified in the financial records of a company. In some cases, the data is available at the segment level. If not identified at the segment level, methods exist to allocate the data to the segments to compute these measures. Our proposal for a profitability reporting program provides for collecting the necessary data at the segment level to compute these types of measures.

Capital Expenditures to Sales Ratio

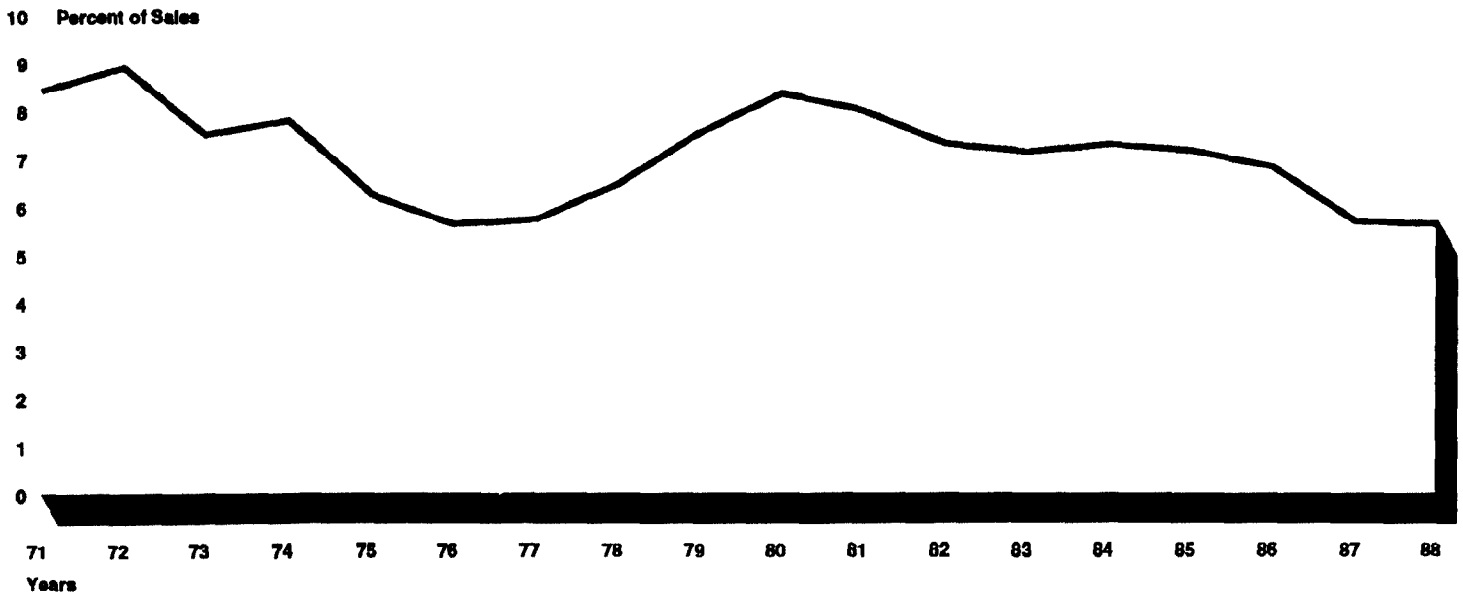
Figure I.2 shows the capital expenditures for facilities and equipment to sales ratio for 110 firms that perform varying degrees of defense work. DOD's policies are designed to encourage investment in plant and equipment. Computing this measure for government contractors could over time indicate whether DOD's policies are accomplishing their intended objective to encourage contractors to invest in new plant and equipment.

Capital to Labor

The capital-to-labor ratio is a measure of the capital intensity of a specific line of business. This measure could indicate whether the government's contract pricing, financing, and profit policies were encouraging contractors to invest in capital. There has been concern expressed that DOD's contracting processes and profit policy do not provide adequate incentives for contractors to invest in capital equipment. A comparison of the capital intensity measured over time could indicate whether government contractors responded to such incentives. Data to compute the

capital-to-labor measure are not currently available in financial reports. The data could be available with segment-level reporting.

Figure I.2: Capital Expenditures to Sales for 110 Firms



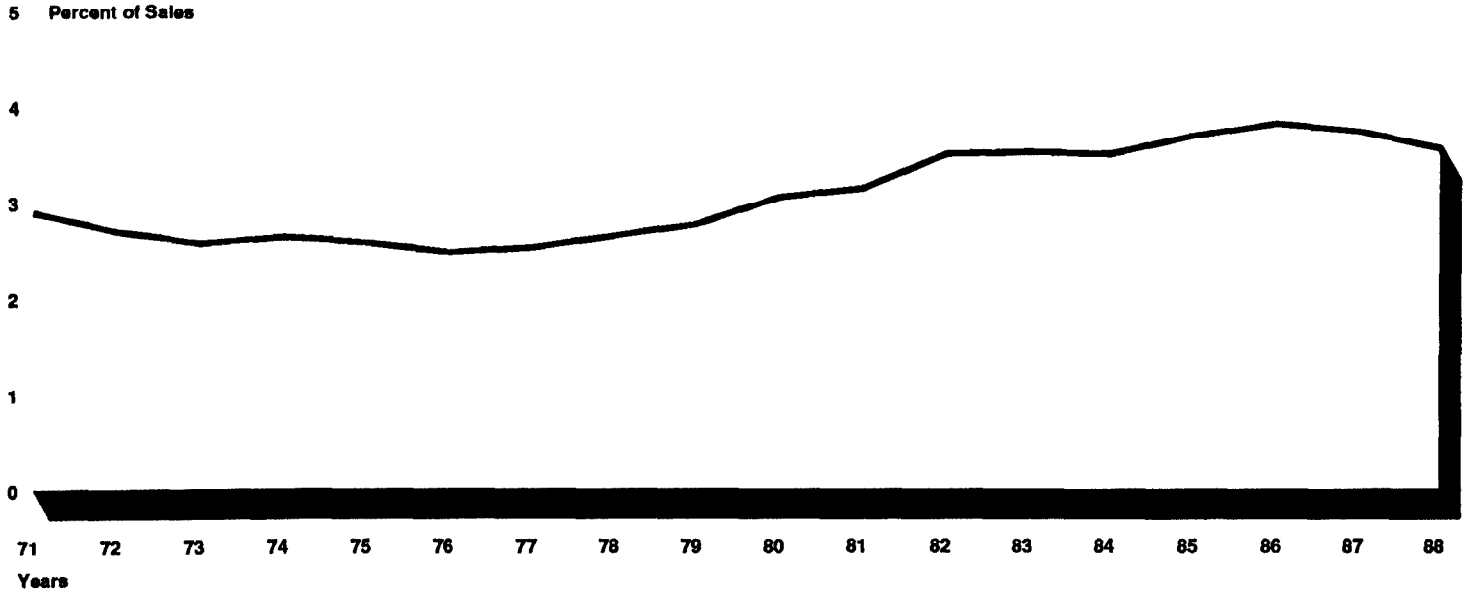
R&D to Sales

Financial data on R&D costs from defense segments could indicate to what degree the defense industry was being required to sponsor its own R&D. Much of the R&D performed currently by the defense industry is sponsored by the government. Figure I.3 shows the R&D costs that the government does not reimburse to contractors as a percentage of sales. The ratio of R&D costs to sales could increase, if, for example:

- DOD increases the use of fixed-price contracts for R&D efforts. Defense industry associations have argued that these type of contracts for R&D are inappropriate because they may cause contractors to expend non-recoverable funds for R&D. The type of data shown in figure I.3 could be used to examine the degree to which contractors are required to expend non-recoverable funds for R&D.
- Defense contractors are not reimbursed for all of their independent R&D costs. DOD negotiates ceilings on contractors' independent R&D expenses. Defense contractors are reimbursed for much of these independent R&D

costs through their overhead. By establishing these ceilings, DOD is limiting the amount of reimbursement that contractors will be provided. The type of data shown in figure I.3 could be used to examine the effect of causing contractors to expend their own funds for independent R&D in excess of the ceilings that the government places on these costs.

Figure I.3:R&D to Sales for 110 Firms[a]



[a]R&D to sales ratio examines non-reimbursed R&D expenses that relate to the development of new products and services. It reflects only the firm's contribution and does not reflect direct or indirect government sponsored R&D.

Firm-Level Financial Measures

Financial measures such as debt and liquidity management measures can be computed using the data in publicly available financial records. Debt and liquidity measures indicate a firm's ability to meet short-term obligations and the relative industry financing structure. These measures could be done at the segment level but would require an allocation or attribution of firm-level data to the segment and the establishment of the proper reporting arrangements as described in our 1987 proposal for a profitability reporting program.

Some analysts feel strongly that these measures could not be done at the segment level because they would require an allocation or attribution of firm-level data to the segment. However, since firm-level data, such as "home office" expenses, are currently allocated to the segment level, others believe that it is feasible to expect that other firm-level data could be allocated to the segment level. If a reasonable allocation method were to be proposed, we would consider it a worthwhile exercise to evaluate these allocation methods.

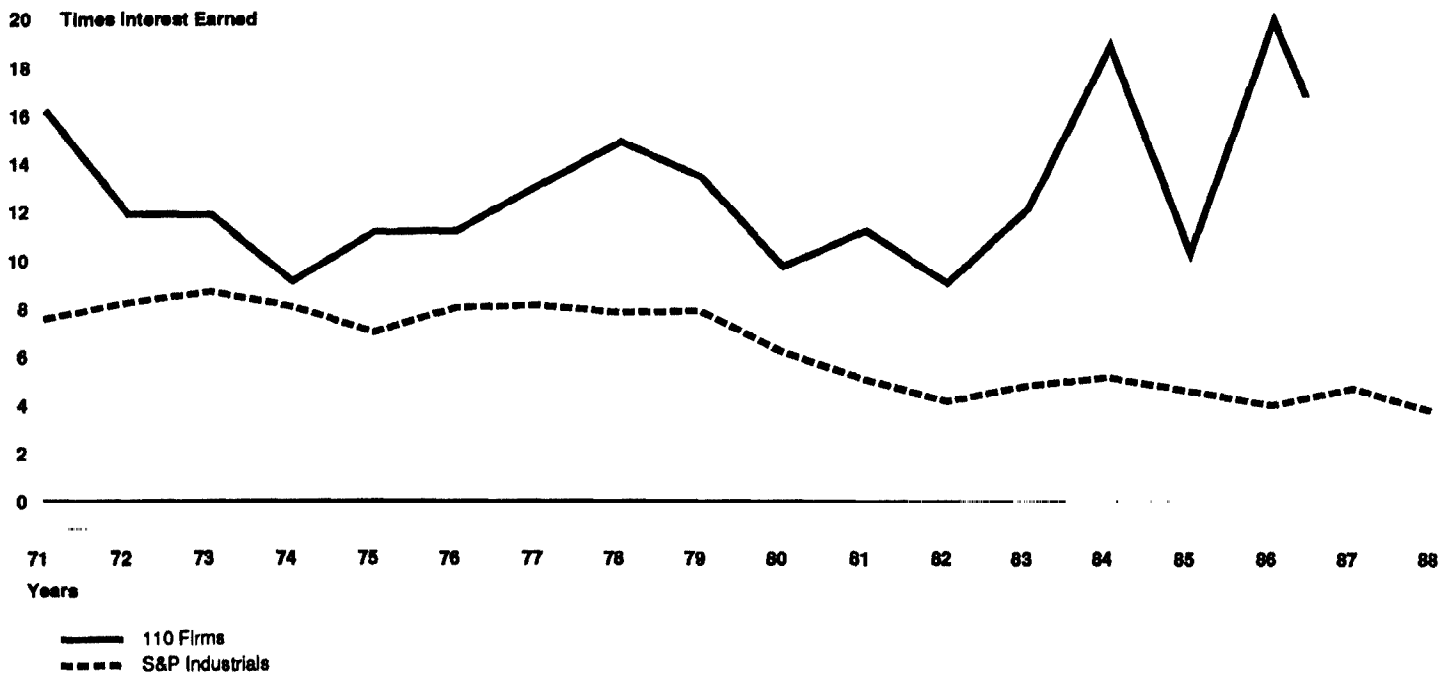
Debt Management Measures

Debt management measures provide data on the amount of borrowed funds and the ability to make interest payments. Commonly used debt measures include debt to equity, debt to assets, and times interest earned.[5] For example, figure I.4 shows that the 110 firms were in a relatively better position to make interest payments compared to the S&P Industrial Index. If this ratio is low, then a firm may not be able to pay interest payments.

If methods were developed to compute the management measures for the segment level of companies performing defense work, then government policy analysts would have more insight as to what effect the government financing policies are having on government contractors. Again, if such methods were proposed, we believe it would be worthwhile to evaluate them.

[5]Times interest earned provides an indication of a firm's ability to make its interest payments.

Figure I.4: Times Interest Earned for 110 Firms and S&P Industrials



Liquidity Measures

Liquidity measures provide information on working capital or short-term financing requirements. These measures show the relationship of a firm's cash and other liquid assets to its current financial obligations. Two of the most commonly used liquidity measures are the quick ratio and current ratio, which are shown in figures I.5 and I.6. (See app. II for the definition of these measures.) Both figures show that the 110 firms in our sample are in a relatively better position to meet their short-term financial obligations. If this information were available for defense segments, then government policy analysts would be better able to assess more accurately the effect of the government's progress payment policy on government contractors.

To use these measures at the segment level, procedures would be needed to allocate or attribute cash to the defense segments. Cash is generally managed at the corporate level and is not allocated to the company's segments. Again, if such methods were proposed, we believe it would be worthwhile to evaluate them.

Figure I.5: Quick Ratio for 110 Firms and S&P Industrials

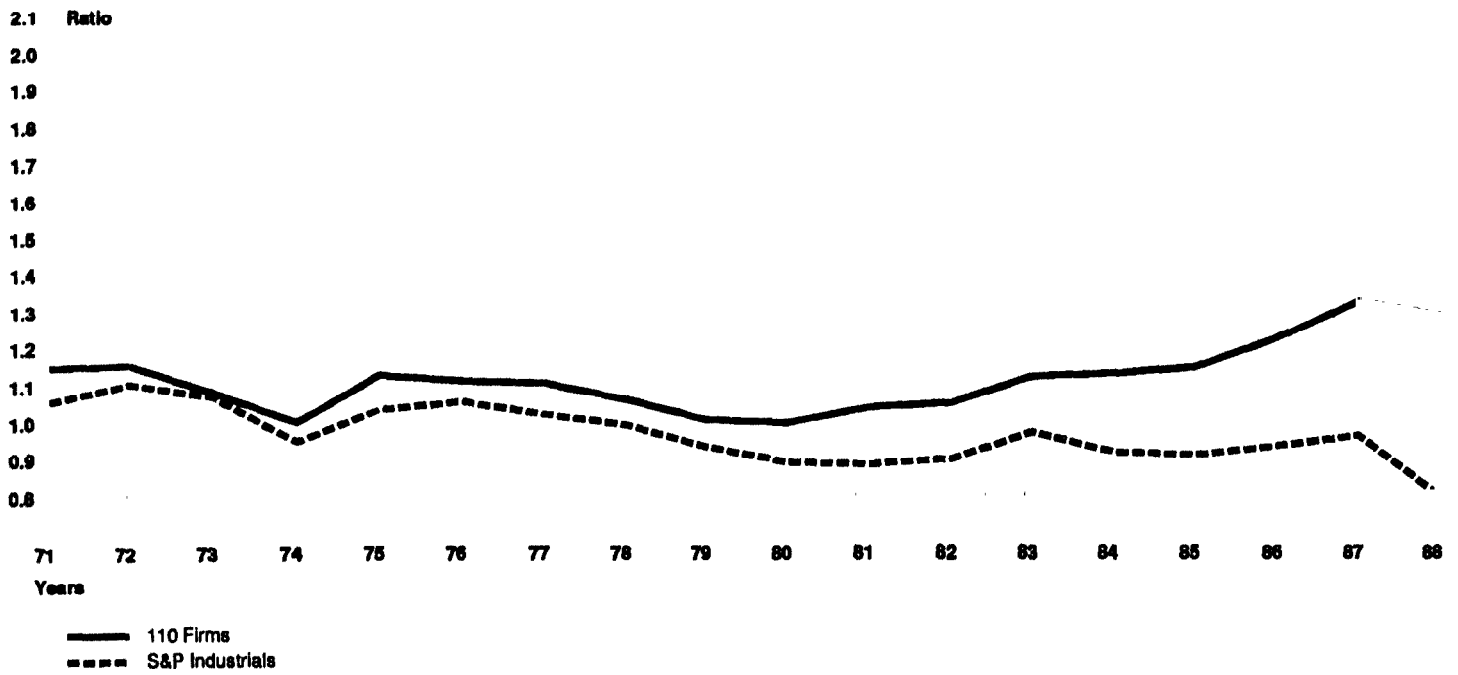
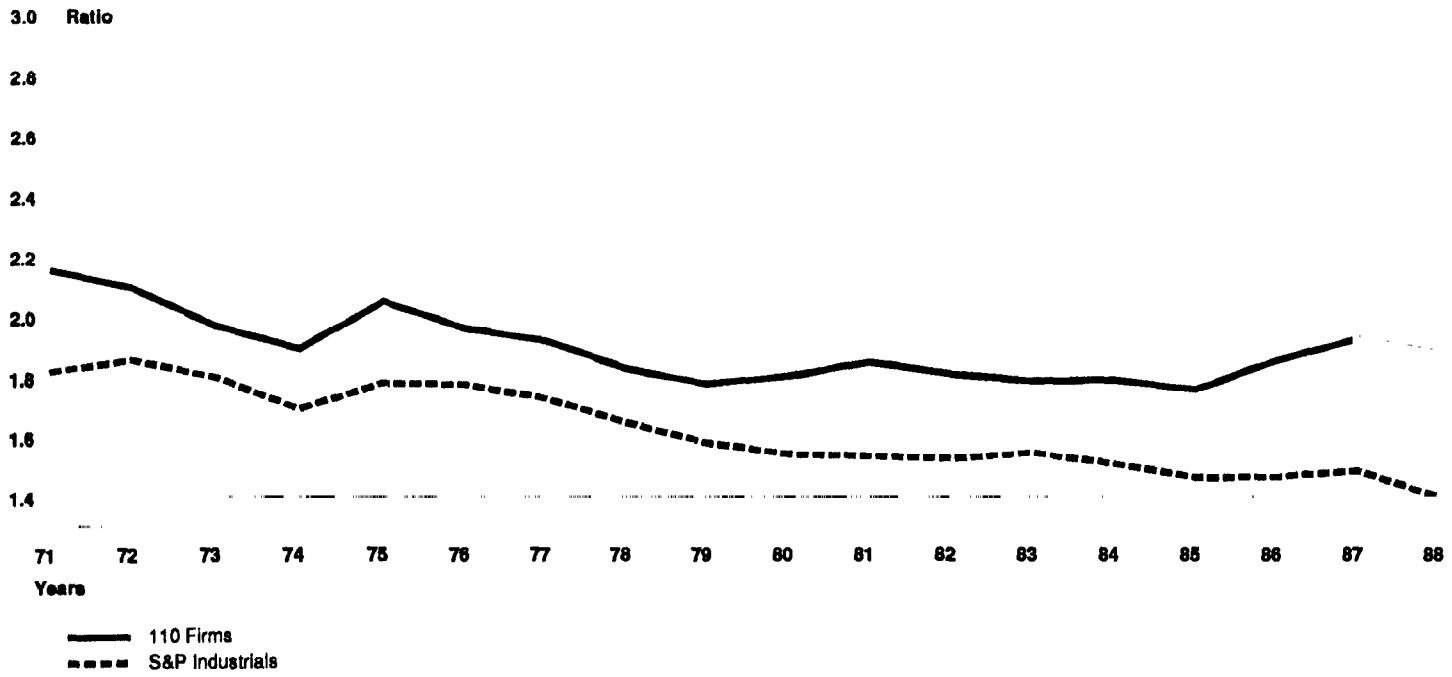


Figure I.6: Current Ratio for 110 Firms and S&P Industrials



Assessment of Profitability Measures

Traditional profitability measures include ROI and return on sales. ROA and return on equity (ROE) are two measures of ROI. ROE is widely used in financial markets because it measures the return to stockholders but it is not computed at the segment level because of the lack of procedures for allocating or attributing equity to the segments. As indicated in our 1987 report, we believe that ROA is the more desirable measure of profitability for the reasons listed below:

- Provides a basis for measuring the cumulative impact of policies.
- Computed at the segment level of a firm.
- Derived from historical, financial, and audited data.

Return on sales, which can be computed at the segment level, is a less desirable measure because it does not measure how effectively a firm invests its capital and is based on the value of output instead of the input. On the other hand, comparing return on sales among firms in the same industry, in limited cases, may be useful in providing an additional measure of the relative profitability among those firms.

Since a profitability reporting program would require a measure that would track the pattern of profitability over time to indicate the cumulative effect of government policies, we tracked the relationship of two measures, ROA and ROE. Figure I.7 shows that generally ROA and ROE for the S&P Industrials have moved in tandem to each other over the past 18 years. ROA can be calculated at the segment level and is therefore, the primary measure of defense segments' profitability. We believe, for the purposes of a profitability reporting program, ROA represents an acceptable surrogate for ROE.

Figure I.7: ROA and ROE for S&P Industrials

Objectives, Scope, and Methodology

The House Co-Chairman of the Military Reform Caucus requested that we examine the types of financial measures that could be used to assess the effect that federal government policies may have on the profitability of government contractors.

To accomplish these objectives, we researched the literature on financial measures, interviewed experts on financial theory, analyzed balance sheet and income statement information for the companies in the S&P Industrial Index, as well as financial information for companies that perform defense work. Our analysis assesses government contractors using publicly available firm-level data. The usefulness of the firm-level data in describing the financial health of government contractors is limited because it does not isolate the profitability of the defense part of the companies. Nevertheless, our analysis of firm-level data shows the type of analyses that could be done if segment-level data were made available. The lack of available data, identified discreetly to government contractor segments reconfirms our previous position that a profitability reporting program is needed.

In performing our review, we analyzed financial measures at the firm level during the 18-year period 1971-88. We computed the measures using S&P's Compustat II data base. Table II.1 shows the formulas used to compute the financial measures.

The companies included in our sample performing defense work were identified as such based on the annual dollar value of prime defense contracts received during each year of the 18-year period so that the companies selected would account for 60 percent of the dollar value of prime contracts awarded by DOD each year. Our reviews included 110 firms.

The method used to compute the financial measures was similar to the method that S&P uses, while the profitability measures are those used in our 1986 study.

Our review was performed in accordance with generally accepted government auditing standards from March 1989 to March 1990.

Table II.1: Categories and Formulas for Financial Measures

Measures	Formula
Price	
PE	Year-end stock price divided by 12-month earnings per share.
Profit	
ROE	After tax income divided by stockholder's equity.
ROA	After tax income plus deferred taxes plus interest costs divided by total assets.
Debt Management	
Times interest earned	Interest expense plus income taxes plus net income divided by interest expense.
Liquidity	
Current	Total current assets divided by total current liabilities.
Quick	Total current assets minus inventories divided by total current liabilities.
Other	
R&D/ sales	R&D costs divided by sales (excludes R&D costs reimbursed by the government).
Capital expenditures	Amounts spent for construction of facilities and equipment, including acquisitions accounted for as purchases.

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