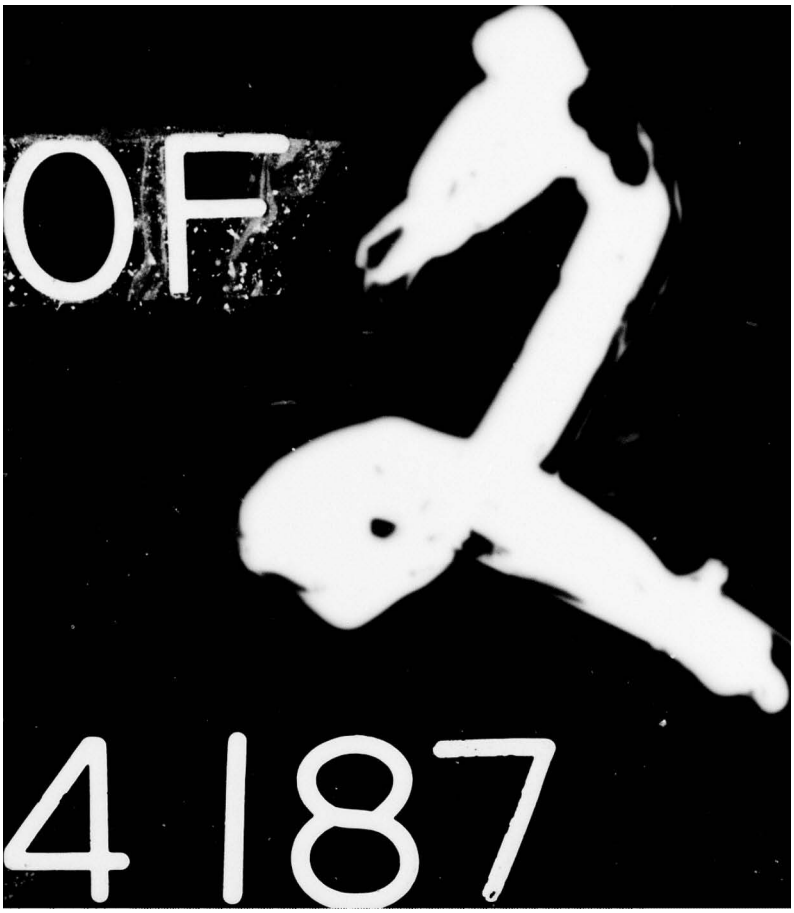
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The Armed Service Procurement Regulation requires that a contractor's financial capability be determined prior to contract award. Financial analysis performed in support of a DOD procurement may be performed by a number of offices such as the Procurement Contracting Officer to a Defense Contract Administration Services Office. There is a potential in this situation for repetition, inaccuracies, or unusable results if a consistent format of financial analysis is not followed. This study was designed to develop tools and techniques of financial analysis for the aerospace industry. The techniques of analysis were gathered from available literature and then tailored to the aerospace industry. The study culminates by combining these techniques into a checklist type model which the researchers believe will be useful to evaluate a contractor prior to contract award, and to assist in the contract management effort after contract award.

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A FINANCIAL ANALYSIS APPROACH APPLICABLE TO THE AEROSPACE INDUSTRY

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

By

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TABLE OF CONTENTS

Page

ACKNOWLEDGEMENTS iii

LIST OF TABLES viii

LIST OF FIGURES ix

Chapter

I. INTRODUCTION 1

Problem Statement 1

Overview 2

Background 3

Objectives of the Acquisition Process . . . 5

Analysis of the Aerospace Industry 6

The Cyclical Nature of Military Sales Versus Commercial Sales 9

Demand Uncertainty of "Jumbo Jets" . . . 9

Domestic International Sales Corporation (DISC) Tax Laws Modified 10

Use of Deferred Costs 10

Capital Funds Required 11

DOD Guidelines for Financial Analysis . . . 12

Assignment of Financial Analysis Responsibility 15

Justification 16

Scope 17

Chapter Page

Objectives 18

Research Questions 18

II. RESEARCH METHODOLOGY 19

Overview 19

Development of Financial Analysis Inputs . . 19

Development of an Approach to Financial Analysis Applicable to the Aerospace Industry 23

Assumptions 25

Limitations 25

III. FINANCIAL ANALYSIS INPUTS 26

Overview 26

Review of Literature 26

Sources of Financial Information 27

Corporate Financial Statements 28

Investment Advisory Service Reports 34

Aerospace Industry Analysis Reports . . . 34

Individual Aerospace Corporation Reports 37

Other Aerospace Reports 38

Creditor Reports 39

Business and Aerospace Publications 41

Summary 42

Tools and Techniques of Financial Analysis . 42

Ratio Analysis 43

Liquidity Ratios 44

Current Ratio 45

Chapter Page

Quick, or Acid Test Ratio 46

Net Working Capital 47

Leverage Ratios 48

Debt Ratio 48

Current Liabilities to Tangible Net Worth Ratio 49

Total Debt to Tangible Net Worth Ratio 50

Efficiency Ratios 51

Inventory Turnover Ratio 52

Receivables Turnover Ratio 53

Net Working Capital Turnover Ratio . . 53

Profitability Ratios 55

Net Profit Margin 55

Return on Total Assets 56

Return on Net Worth 58

Summary 59

Trend Analysis 59

Cash Flow Analysis 64

Funds Flow Analysis 66

Financial Forecasting Techniques 69

Sales Forecast 70

Cash Flow Forecasts 71

Pro Forma Financial Statements 73

Corporate Financial Policy 75

Capital Budgeting Decision 75

Chapter Page

Capital Structure and Debt/Equity Financing 80

Capital Investment Decision 85

"Profit 76 Study" 87

Corporate Dividend Policy 90

Summary 92

Prior Performance on Government Contracts . . 94

IV. FINANCIAL ANALYSIS CHECKLIST 97

Overview 97

Uses of the Checklist 99

Financial Analysis Checklist 99

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS . . . 106

Summary 106

Conclusions 113

Recommendations 114

APPENDICES 116

A. FINANCIAL STATEMENTS 117

B. AEROSPACE INDUSTRY REPORTS 122

C. INVESTMENT ADVISORY SERVICE STOCK REPORTS . . . 130

D. WORKSHEETS: FINANCIAL RATIOS AND TREND ANALYSIS 135

SELECTED BIBLIOGRAPHY 140

A, REFERENCES CITED 141

B. RELATED SOURCES 145

BIOGRAPHICAL SKETCH OF THE AUTHORS 147

LIST OF TABLES

Table		Page
1.	Government Budget and Defense Budget in Current Dollars and 1969 Dollars	4
2.	DOD Budget: Military Pay Versus Procurement of Equipment	4
3.	Commercial Aircraft Deliveries	10
4.	Quality Ratings of Debt Issues	40
5.	Summary of Financial Ratios	60
6.	Lockheed Debt Structure	86

LIST OF FIGURES

Figure		Page
1.	Illustration of Trend Analysis--Current Ratio . .	63
2.	Illustration of Trend Analysis--Debt Ratio . . .	63
3.	The Capital Budgeting Decision.	77
4.	Cost of Capital and Optimum Debt/Equity Ratio . .	83

CHAPTER I

INTRODUCTION

Problem Statement

In the United States Air Force Procurement system, the Procurement Contracting Officer (PCO) is charged with the responsibility for determining if the prospective contractor has the overall ability to fulfill the requirements of the contract. As part of a meaningful appraisal of a contractor's viability, the PCO or his designated representative is required by the Armed Services Procurement Regulation (ASPR) to perform a financial analysis of the contractor (52:K:8). This analysis can be performed by the PCO or delegated to such agencies as a Defense Contract Administration Services Office (DCASO), an Air Force Plant Representative Office (AFPRO), or specialists in a Systems Program Office (SPO). Since a prospective contractor may be evaluated by any of these parties, the possibility exists that they use different methods of financial analyses. To assure that a consistent and comprehensive financial analysis is performed, there should be a standardized approach to the process. This need could be satisfied by identifying those financial inputs and techniques that should be used by DOD financial analysts and by developing

an approach to financial analysis that will assist in determining the financial capability of the prospective contractor.

Overview

This thesis will identify inputs and techniques of financial analysis and then develop an approach to financial analysis that could be used by all DOD agencies and analysts in evaluating the financial capability of a prospective aerospace contractor. The researchers have focused their attention on developing an approach to financial analysis that is applicable to individual corporations in the aerospace industry. For the purposes of this thesis, an aerospace corporation is defined as a corporation that manufactures or supplies aircraft and/or missile end items and major components to the DOD under contract. The reason for selecting the aerospace contractors as the focal point for a financial analysis is due to the critical role the aerospace industry plays in meeting DOD objectives and the large dollar volume associated with contracts awarded to the industry.

The remainder of Chapter I is concerned with the following information about this research effort: (1) Background, (2) Justification, (3) Scope, (4) Objectives, and (5) Research Questions. A separate discussion of each of these areas provides the information which expands on the

problem statement, and leads to a formulation of the research questions.

Background

A major factor that should cause the DOD financial analyst to have concern about the financial viability of an aerospace contractor is the relative decrease in the size of the defense budget. Although dollar amounts have grown, the purchasing power of the annual defense appropriation has declined. In addition, the defense budget in relation to the government budget has steadily decreased (Table 1). It is also noteworthy that as the defense dollar continues to shrink, personnel costs (active and retired military) have increased at the expense of procuring military equipment (Table 2). The implication is that the DOD cannot afford to obligate substantial funds to a contractor that may not stay in business. Not only would the award of a contract to a financially unsound corporation constitute misuse of public funds, but it could seriously delay or cancel the procurement of a vitally needed weapon system.

The importance of performing adequate financial analyses of prospective contractors is further emphasized in a discussion of the following four areas: (1) Objectives of the Acquisition Process, (2) Analysis of the Aerospace Industry, (3) DOD Guidelines for Financial Analysis, and (4) Assignment of Financial Analysis Responsibility.

TABLE 1

GOVERNMENT BUDGET AND DEFENSE BUDGET IN CURRENT DOLLARS AND 1969 DOLLARS (Figures in $ billions) (37:67)

	Current Dollars		1969 Dollars	
Year	Government Budget	Defense Budget	Government Budget	Defense Budget
1976E	373.5	92.8	225.8	53.7
1975	324.6	86.6	211.5	55.3
1973	246.5	75.1	193.7	57.2
1971	211.4	76.8	185.4	66.8
1969	184.5	80.2	184.5	80.2

TABLE 2

DOD BUDGET: MILITARY PAY VERSUS PROCUREMENT OF EQUIPMENT (Figures in $ billions) (37:59)

Outlay	1969	1971	1973	1975	1976E
Military Pay	23.8	26.0	27.6	31.2	32.8
Procurement	24.0	18.9	15.7	16.0	16.5

Objectives of the Acquisition Process

An important objective of DOD in the weapon acquisition process is the procurement of quality "public goods" at a fair and reasonable price (6:1). DOD is in a unique position as a purchaser of weapon systems. These weapon systems provide for the security and well-being of the United States and, thus, are considered "public goods" (35:484). It is in the interest of DOD as the only provider of this service to have as many reliable sources as possible to keep competition high and price low (20:328). This objective is of major importance when one considers the continuous political and economic pressure exerted to limit the dollar amount of the defense budget.

A second objective of DOD in purchasing weapon systems is to preserve the industrial base that provides the weapons, equipment, and services required to meet U.S. national defense objectives (12:14). Peck and Scherer comment that ". . . the Government can determine the entry and exit (and) the growth and decline of firms making weapons [38:49]." The economic power that DOD wields in the U.S. economy is demonstrated by the fact that defense spending in FY 76 accounts for 24 percent of the Government budget and 5.2 percent of the U.S. GNP (8:1).

Numerous policies and regulations exist to guide the DOD in the expenditure of the defense budget. One of these policies directs that part of the spending be

designated to areas of high unemployment (6:17). Other policies require that prime contractors insure that a proportionate amount of sub-contracts go to small businesses and that goods and services purchased by public funds comply with the Buy American Act (6:14). Thus, another objective of DOD becomes the social and economic benefits that can be derived from defense spending.

It is apparent that if a selected contractor is not financially capable of successful performance, the impact is threefold. First, a weapon system needed for national defense is not received or is delayed. Second, an adequate number of defense suppliers may not be available to provide needed goods in times of national crisis. Finally, the desired social and economic benefits may not occur.

Analysis of the Aerospace Industry

The aerospace industry is in a unique and precarious situation. J. Fred Weston describes the aerospace industry as ". . . large, growing, and significant. No other business activity has as much significance for the national security [61:v]." Since a large portion (in 1975 approximately 57 percent (16:7)) of the industry's revenues are derived from DOD expenditures, these companies are largely dependent on the Government for their continuing viability as business enterprises. Periodic surveys and studies have pointed out that federal procurement policies

designed to protect the Government and the taxpayer have tended to place a greater burden of risk on the industry and restrict profits to low levels (16:12).

Additionally, there is a disparity in the amount of profits received for production of civilian aircraft versus military aircraft. The Standard and Poor's Industry Survey relates that in the majority of aerospace companies, commercial projects determine long-term growth prospects because commercial profit margins are higher (46:A-18). If this is the case, the implication is that a major aerospace contractor like Lockheed Aircraft Corporation may have relatively poor growth prospects. To illustrate, Lockheed's situation is discussed.

In 1966, airline passenger volume was growing at 15 percent per year (3:91). Heady with success from its military products, Lockheed decided to enter the commercial jet market. Having missed the first period of rapid growth in the late 1950s, Lockheed was determined not to miss the second. Their answer lay in building the L-1011 Tri-star without a firm commitment from a single airline (3:91). Management estimated that the L-1011 could capture 300 planes of the estimated 600 plane "jumbo jet" market. As of 1976, Lockheed has spent $1.2 billion on R & D and production startup costs, sold only 158 planes, and is "writing off" $50 million in deferred costs per year through 1985 (25:20).

In addition, Lockheed has experienced many difficulties in financing their military aircraft, the C-5A. In fact, the C-5A project almost caused Lockheed to go out of business. The Air Force had to pay $2.3 billion for an estimated $1.28 billion contract and, in addition, guarantee repayment of $250 million in loans to Lockheed (22:17). These steps, however unpalatable, were necessary to insure on-time delivery and prevent disappearance via bankruptcy of a major defense supplier (22:14-17). One of the many reasons given to explain Lockheed's financial troubles on the C-5A project was the inability of Lockheed personnel and the PCO to accurately forecast the cash and financing requirements needed to complete the project. In addition, findings of the Link study showed that the overall financial strength and capability of Lockheed was overstated at the outset of the program (22:17). Accordingly, Lockheed faced and still faces serious financial difficulties.

Not every aerospace corporation is in the same predicament as Lockheed, but the problems faced by the industry as a whole are serious. The major problems include: (1) the cyclical nature of military sales versus commercial sales, (2) the demand uncertainty of "jumbo jets," (3) Domestic International Sales Corporation (DISC) tax laws, (4) use of deferred costs, and (5) capital funds required.

The Cyclical Nature of Military Sales Versus Commercial Sales. When one sales market is strong, the other is weak. The industry has not experienced a meaningful uptrend in both markets at the same time in the past 20 years (1:118). Military sales have been very strong since early 1974 (i.e., the current production phase of the A-10, F-5, F-14, F-15, and AWACS[1]), and the future is promising (i.e., the development and production of the B-1, F-16, F-18, STOL,[2] and UTTAS[3]). However, the industry's commercial sales are in a clear downtrend. Commercial sales peaked in 1973 at $4.3 billion with 1976 sales estimated at $3.0 billion (1:118).

Demand Uncertainty of "Jumbo Jets." The latest trend in civilian aircraft has been toward building expensive super-carriers, i.e., the Boeing 747, the McDonnell-Douglas DC-10, and the Lockheed L-1011. Standard and Poor's points out that sales predictions (particularly for McDonnell-Douglas and Lockheed) may have been overly optimistic (46:A-20). To date, the airlines have not ordered sufficient numbers of these aircraft to make them profitable for the aerospace firm (58:101). Sales trends for these aircraft are clearly down, or, as in Boeing's sales, stagnant (Table 3).

---

[1]AWACS--Airborne Warning and Control System.

[2]STOL--Short Takeoff and Landing aircraft.

[3]UTTAS--Utility Tactical Transportation Aircraft System.

TABLE 3

COMMERCIAL AIRCRAFT DELIVERIES (58:101)

Company	1973	1974	1975	1976E	1977E
Boeing B-747	30	22	20	27	20
McDonnell DC-10	57	47	43	19	15
Lockheed L-1011	39	41	25	16	10

Domestic International Sales Corporation (DISC) Tax Laws Modified. The DISC program was estimated to stimulate exports by allowing the tax deferral of export profits (46:A-27). However, the Tax Reform Act of 1976 has modified DISC operations by limiting the amount of export income that can be deferred. Previously, one-half of export income was deferrable. Now, the total income deferrable is one-third (46:A-27). Since DISC deferrals are subtracted from income taxes, the reduction in the amount of profit that may be deferred has the effect of raising the corporation's tax rate and lowering income. Boeing (41 percent of sales are exports), McDonnell-Douglas (40 percent), and Northrop (25 percent) are the aerospace corporations most effected by this change in the law (57:102).

Use of Deferred Costs. The aerospace industry normally defers, i.e., spreads, the costs of R & D and production

startup over the estimated production life of the aircraft program. Financial problems occur with the use of this method of accounting when the actual production life of the program falls short of the estimated production life. Lockheed (the L-1011 program) is currently writing off $50 million a year and will do so until 1985. McDonnell-Douglas (the DC-10 program) has accelerated its write-offs of deferred expenses. If new DC-10 orders are not received in the near future, there could be a major write-off of deferred costs in 1978 (57:102). In essence, the use of deferred costs can allow the firm to give the appearance of being "financially sound" when, in fact, the opposite is true. Corporate examples in recent history that illustrate this fact are Lockheed Aircraft Corporation and Grumman Corporation. It is possible that McDonnell-Douglas may soon join this list.

Capital Funds Required. A significant characteristic of the aerospace industry is the large sums of money required to develop a new aircraft. Lockheed invested $1.2 billion before it delivered its first L-1011 and McDonnell-Douglas invested $900 million in its DC-10 program (57:116). Another example that typifies the cost of developing a new aircraft is reflected in the 1977 defense budget. For FY 77, $1.5 billion has been allocated to the B-1 bomber,

with $1 billion designated for the purchase of three aircraft (63:10).

The large requirement for funds only underlines the uncertainty which surrounds the industry and provides questions as to the viability of particular contractors. The ability of the industry as a whole to obtain funds is so poor that the Presidential Aviation Advisory Commission has suggested creation of an Under Secretary position to institute project management procedures (similar to those of USAF Systems Project Offices) in the production of civilian aircraft (46:A-20).

The potential inability of the aerospace industry to obtain financing to meet requirements poses a serious situation. A recent Aerospace Industries Associa study summarized the situation as follows:

> As compared with the profits of industries oriented to commercial markets, defense contractor profits are too low for the risks defense contractors face and for their long-term viability. Uncertainty is the principal risk perceived by the survey participants--uncertainty pertaining both to the fulfillment of present contracts and the winning of future contracts. Because of these and other "negatives," defense contractors are perceived as less attractive risks among the corporate clients of banks and other financial institutions. Unless these problems can be reduced, if not eliminated, the defense industry is likely to find it increasingly difficult to secure both the short-term and long-term financing it requires [16:13-14].

DOD Guidelines for Financial Analysis

The PCO is required by ASPR to perform a financial analysis of the contractor. General guidelines as to the

nature and extent of the financial analysis to be performed are contained in ASPR (Section 1, Appendix E, and Appendix K). A summary of the important guidelines follows:

Section 1 of ASPR outlines the requirements for advanced procurement planning (52:1:210). The determination of the contractor's financial capability is one of the milestones to be included in advanced procurement planning.

Appendix E of ASPR states,

> . . . the necessity for financial information and analysis, and the scope, depth and detail of analysis of financial capability must vary reasonably with the circumstances of particular cases [52:E:10].

The "scope, depth, and detail" of the financial analysis is left to the discretion and judgment of the PCO with the following guidelines:

> . . . financial analysis would serve no useful purpose in connection with contractors who are known from experience to be so strong and so competently managed as to be relied upon to perform their contracts satisfactorily, . . . [52:E:10].

From the above, it is implied, though not stated, that an in-depth analysis of a "proven" contractor may not be performed. Therefore, it is possible that at the discretion of the PCO, aerospace companies such as Boeing, McDonnell-Douglas, Lockheed, etc., may not have their financial capability examined as closely as might be needed.

Additionally, Appendix E gives guidance for the collection of necessary financial data to adequately complete a comprehensive financial analysis. ASPR states,

> . . . An estimated cash budget (cash flow forecast) and financial statements prepared by the contractor will be very useful for the purpose of arriving at an informed judgment as to the cash requirements (both for the contract and for the contractor's other activities) [52:E:11].

and,

> . . . When considered useful or necessary, such estimates should be requested from the prospective contractor, analyzed by financial personnel, and discussed to extent necessary [52:E:11].

Again, this area of actually collecting the financial data and analyzing it is a judgmental decision of the PCO. However, it is important to note that ASPR does not specify what constitutes an adequate financial analysis. The PCO performs the analysis as he determines appropriate.

Recently, the Office of Management and Budget (OMB) distributed Circular A-109 which dealt with the procedures to be followed in the weapon system acquisition process. Specifically, it states that the selection of a contractor for the full scale development and production of a system is to be made on the basis of a number of factors. One such factor is the ". . . contractor's demonstrated management, financial, and technical capabilities to meet program objectives [36:20]." Financial analysis and/or management is not mentioned elsewhere in the circular. These general guidelines create the possibility that an incomplete and/or inaccurate analysis will be made.

Assignment of Financial Analysis Responsibility

The PCO determines who performs the financial analysis of the prospective contractor. The PCO may perform the analysis himself; he may delegate this responsibility to the Administrative Contracting Officer (ACO) of the Defense Contract Administration Services Office (DCASO) located nearest to the prospective contractor; or he may task the ACO located at the prospective contractor's Air Force Plant Representative Office (AFPRO). However, if the PCO (or ACO) does not feel that he has enough information to complete the analysis, he may request assistance from other Contract Administration Offices.

For the acquisition of a major weapon system,[4] the DOD normally establishes a SPO to manage the development and production of that system. A formal source selection process is implemented to select a contractor. This process includes establishing a Source Selection Authority (SSA), a Source Selection Advisory Council (SSAC), and a Source Selection Evaluation Board (SSEB) (12:260-262). The SSEB is usually tasked with performing the required financial analyses of the prospective contractors, or it may task any of the previously mentioned agencies to do so (55:6). The financial analyses findings of the SSEB are reviewed

[4]Major weapon systems are classified as those that have costs in excess of $75 million for Research and Development and/or $300 million for Production (56:2).

by the SSAC and are taken into consideration when the SSAC makes its recommendations to the SSA. There are specific DOD directives that emphasize the importance of determining the financial capability of a prospective contractor in the acquisition of a major weapon system. These pertinent directives are: (1) DOD Directive 5000.1, Acquisition of Major Weapons Systems, and (2) DOD Directive 4105.62, Proposal Evaluation and Source Selection.

With the number of agencies available for performing a financial analysis of a prospective contractor, the possibility exists for confusion on who is doing what. The net result could be an incomplete or inaccurate analysis, or, a great deal of duplication of effort.

Justification

There is a need for developing a methodology of financial analysis that can be used by any DOD agency when a determination of the financial capability of an aerospace corporation is required. This need has been recognized by DOD (26:1). In the fall of 1975, DOD engaged the services of the Logistics Management Institute (LMI). The purpose of this action is for LMI to study the matter and propose solutions that would allow DOD to determine the financial capability status of its contractors. LMI designated this study Project 75-11 with the title of "Analysis of Contractor Financial Capability."

An overview of Project 75-11 is:

Definition of Problem. DOD does not have adequate knowledge of the financial capability of its contractors. DOD needs a disciplined, well-structured system to provide financial information at the following points in the procurement process:

1. Pre-Award
2. Post-Award
3. Special Studies

Objectives of Study. Several objectives of Project 75-11 are:

1. Assess current DOD practices.
2. Survey analytical measures employed by private financial institutions.
3. Survey commercially available computer based analytical systems.
4. Develop basic design of a suitable DOD system [26:1-2].

The LMI study was initiated because DOD felt that a more in-depth pre-award financial analysis is needed on large contractors and that the analysis could be performed more effectively through ready access to a computer based data analysis system (26:5). As of May, 1977, LMI has not released its preliminary findings.

Scope

This research is concerned with identifying those information sources and financial techniques that are available to DOD financial analysts and are necessary to perform a financial analysis on prospective contractors in the aerospace industry. Additional effort is directed towards developing a financial analysis approach that is applicable to analyzing the financial capability of aerospace corporations.

Objectives

1. To identify those factors of financial analysis that are important for a DOD financial analyst to properly analyze the financial capability of a prospective aerospace contractor.

2. To develop a financial analysis approach that can be applied to the aerospace industry.

Research Questions

1. What specific information and financial techniques will be most useful to evaluate the financial capability of an aerospace contractor?

2. How can this information be combined to form an approach to financial analysis that is applicable to the aerospace industry?

CHAPTER II

RESEARCH METHDOLOGY

Overview

The purpose of this chapter is to describe the research techniques which were used to answer the research questions. The approach was subdivided into two stages. The first stage dealt with Research Question 1 and set forth those actions accomplished in defining the inputs to be used in performing a financial analysis of an aerospace corporation. The second stage of research concerned Research Question 2 and described the method used in developing an approach to financial analysis that is applicable to aerospace corporations.[5]

Development of Financial Analysis Inputs

The first stage of the research was designed to answer the question: What specific information and financial techniques will be most useful to evaluate the financial capability of an aerospace corporation? The answer to this

[5]The phrase "an approach" to financial analysis could describe a model or checklist to be followed when performing a financial analysis. The researchers have taken the liberty of using "an approach" and model interchangeably from this point through the remainder of the thesis.

question was developed from a review of the literature specifically pertaining to financial analysis and management. The literature review included:

1. Professional journals and periodicals.

2. Published materials on financial analysis, financial management, and security analysis.

3. Research reports of institutions of higher learning including United States military professional schools.

4. United States Department of Defense publications including those of the various military services.

Literature sources were initially identified by reviewing the library card catalogs at University of Dayton, Wright State University, and the Air Force Institute of Technology School of Systems and Logistics. Key words used to identify possible sources were: financial analysis, financial management, security analysis, and investment analysis. In addition, a review of several indexes of periodicals was conducted to identify research information contained in professional journals and periodicals. The indexes reviewed were the Business Periodicals Index, Readers Guide to Periodical Literature, and the Air University Index to Military Periodicals. Finally, the Defense Documentation Center (DDC), the Defense Logistics Studies Information Exchange (DLSIE), and the Logistics

Management Institute (LMI) libraries were reviewed to identify research information.

Through this review of literature, the opinions of authors in the financial analysis discipline were analyzed regarding those aspects of financial analysis which should be included in any financial analysis model. This research has focused primarily on those aspects of financial information and techniques which literature supported as being relevant in helping satisfy financial analysis requirements. The value of a specific input or technique was evaluated on two basic criteria.

The first criterion was the frequency that a potential input or technique appeared in the literature. For example, if a majority of the sources reviewed stated that a financial analysis model must have a means for measuring the corporation's current ratio, this input then became a candidate for inclusion in the final list of inputs and techniques.

But frequency of occurrence in the literature was not necessarily sufficient justification for retaining that input or technique in the final list. Regardless of frequency of occurrence, the specific input or technique must have been supported by a second criterion, sound logical argument in terms of relevance to the information needs of DOD financial analysts. For example, the review of the literature revealed a strong desire for a financial analysis

model to have information on the corporation's market price to earnings (PE) ratio. But inclusion of this input in an approach to DOD financial analysis is of marginal value because the DOD analyst is interested in the financial condition of the corporation, not what valuation private investors place on the corporation's stock. Therefore, the PE ratio is excluded.

The development of these financial inputs and techniques is documented in Chapter III of this thesis. Each input and technique is discussed as a separate element of Chapter III. It is obvious the list of potential financial inputs and techniques is quite large. To ensure a systematic review of all possible financial inputs and techniques, the researchers identified and researched the following major categories of financial analysis:

SECTION

I. Source of financial information

   A. Corporate financial statements
   B. Investment advisory service reports
   C. Creditor reports
   D. Business and aerospace publications

II. Tools and techniques of financial analysis

   A. Ratio analysis
   B. Trend analysis
   C. Cash flow analysis
   D. Funds flow analysis

III. Financial forecasting techniques

   A. Sales forecast
   B. Cash flow forecast
   C. Pro forma financial statements

IV. Corporate financial policy

A. Capital budgeting decision
B. Capital structure and debt/equity financing
C. Capital investment decision
D. Corporate dividend policy

V. Prior performance on government contracts

Once the final list of financial inputs and techniques was developed, the researchers selected those aspects that were appropriate to an aerospace industry financial analysis and developed an approach to financial analysis that could be used by DOD financial analysts. This approach follows the same sectional outline as that presented above. A discussion of this approach to financial analysis follows.

Development of an Approach to Financial Analysis Applicable to the Aerospace Industry

The financial analysis approach that was developed is essentially a non-quantitative model. It does not yield a "final number" that can be compared to an index and determine--yes, the corporation is financially capable, or, no, the corporation is not financially capable. Only Section II, Tools and Techniques of Financial Analysis, and Section III, Financial Forecasting Techniques, yield quantitative numbers that can be compared to the corporation's past performance or to the aerospace industry's averages. An example is the firm's current ratio, which is included

in Section II of the model. For 1975, the current ratio was 1.2. By comparing 1.2 to the firm's past yearly average of 2.3 and to the aerospace industry's average of 2.1, an indication, not a conclusion, is given that the firm is not in the best financially liquid position. This one ratio or any other ratio cannot allow the analyst to conclude that a corporation is financially capable or not capable. The preceding exercise was used to demonstrate that although there are some quantitative computations that must be made in the model, the final decision on financial capability is essentially subjective on the analyst's part.

Sections I, IV, and V are strictly subjective. The analyst will have to rely upon his experience and financial knowledge to draw the appropriate conclusions. Finally, after properly reviewing and analyzing all five sections of the financial analysis model, the analyst will be able to subjectively determine a corporation's financial capability to perform a government contract.

The development of this aerospace industry financial analysis model is documented in Chapter III of this thesis. Additionally, a "checklist" form of this approach to financial analysis is described in Chapter IV. The following assumptions and limitations were used as a framework for developing the approach.

Assumptions

1. DOD financial analysis is inconsistent in its application to the aerospace industry.

2. All major aerospace corporations must file their financial statements with the Securities and Exchange Commission.

3. Methods of accounting are substantially similar throughout the aerospace industry.

Limitations

1. The results of this research can only be used to infer to the aerospace industry.

2. Subjective judgment on the part of the researchers was used to interpret comments relative to appropriate financial techniques.

3. The approach to financial analysis developed cannot be validated because it is designed to aid the decision-making process rather than yield a yes or no decision.

CHAPTER III

FINANCIAL ANALYSIS INPUTS

Overview

This chapter documents the first stage of research, and answers Research Question 1: What specific information and financial techniques will be most useful to evaluate the financial capability of an aerospace corporation? In general, the answer to this research question was the result of a review and analysis of the literature pertaining to financial analysis and management.

Review of Literature

The review of literature revealed a plethora of material on the subject of financial analysis and management. However, most of this literature pertained to the financial analysis of a "typical" corporation. Few sources of information were found that demonstrated a "how to" approach in performing a financial analysis on a corporation in a specific industry. Those industries that had such specific guides were the banking industry, the public utility industry, the railroad industry, and the air carrier industry. No specific literature was found on how to perform a financial analysis and evaluate the financial

capability of an aerospace corporation or the aerospace industry.

The main portion of this chapter is devoted to the identification and justification of the financial inputs and techniques which should be included in a DOD financial analyst's model of financial analysis of an aerospace corporation. To ensure a systematic review of all possible financial inputs and techniques of financial analysis and, more importantly, to present a sequence that would flow most logically for the reader, the identification and justification of those inputs and techniques are presented in the order identified in Chapter II of this thesis.

Sources of Financial Information

Before the analyst can begin to perform a financial analysis of an aerospace corporation, he must have the necessary financial information. To aid the analyst in selecting the proper information, it is appropriate to consider the following questions: What information is necessary and useful?, Where can this information be found?, How accurate and reliable is this information? These questions will be addressed in each of the major categories of sources of financial information.

The sources of financial information that the DOD analyst has available to him concerning the aerospace industry or a specific aerospace corporation can be

classified into four major categories: (1) Corporate financial statements, (2) Investment advisory service reports, (3) Creditor reports, and (4) Business and aerospace publications. A detailed discussion of the types of financial information to be found in each of the above categories is presented for the reader.

It should be noted here that only corporations that are publicly owned are required to disclose financial and operational information. For purposes of this discussion, the researchers have assumed that all major aerospace corporations that have dealings with DOD are publicly owned and must file the appropriate financial statements with the Securities and Exchange Commission (SEC). Therefore, the DOD analyst has ready access to these statements.

Corporate Financial Statements

The most important sources of financial information concerning a specific aerospace corporation are the financial statements presented by the corporation itself. The aerospace corporations present their statements to their shareholders in an Annual Report. The report is a summary of the corporation's financial position, operations, and management philosophy over the previous twelve months. The corporation also issues quarterly reports highlighting their operations of the past three months. In addition, financial statements are presented to the SEC in much

greater detail in reports identified as Forms 8-K, 10-K, and 10-Q (7:164).

The published financial statements are general purpose entity statements, which present the financial position and operating results of a business for a stated period. Kennedy and McMullen had the following to say about financial statements:

> Financial statements are prepared for the purpose of presenting a periodical review or report on progress by management and deal with the status of the investment in the business and results achieved during the period under review. They reflect a combination of recorded facts, accounting conventions, and personal judgments; and the judgments and conventions applied affect them materially. The soundness of the judgments necessarily depends on the competence and integrity of those who make them and on their adherence to generally accepted accounting principles and conventions [19:11].

and,

> Financial statements contain objective and meaningful data for use (1) by management as the basis for financial and operating routine and policy decisions; and (2) by stockholders, bond holders, banks, creditors, government agencies and labor unions for a variety of reasons [19:14].

Three of the reasons, which are also objectives of financial statements, that the DOD analyst is vitally concerned with are:

1. To provide reliable information about the earnings of a business enterprise.

2. To provide quantitative information useful in predicting the future operations of the enterprise.

3. To measure financial strength. The statements aid in assessing the firm's capability to finance operations out of earnings, its ability to repay obligations when due, and its capacity for obtaining additional funds from investors and creditors (59:960).

In addition to the above reasons, Eugene M. Lerner states that financial statements should be used for control purposes (21:43). By monitoring the various financial output measures, the analyst can be alerted to changes in the corporation's financial position. Since financial statements are important, the researchers will now present the statements with which the DOD analyst should be familiar.

The principal financial statements that are required by the SEC are the balance sheet, the income statement, the statement of retained earnings, and the statement of changes in financial position (34:1). These statements are all historical in nature. A brief description of each statement follows:

The balance sheet portrays the financial condition of the corporation at one particular moment in time (34:18). Kennedy and McMullen emphasize that the balance sheet "is not a statement of value, it is only a listing of the sources and investments of capital [19:5]." The balance sheet lists the assets, liabilities, and owners' equity of the corporation as of the closing date of the statement.

Five types of information and guidance that the analyst may derive from a study of the balance sheet are:

> (1) It shows how much capital is actually invested in the business and how the structure is divided between senior issues and common stock.
> (2) It provides a picture of the working capital position by listing current liabilities opposite current assets.
> (3) It provides a check upon the validity of the earnings reported in the income account by listing the capital surplus (retained earnings) and reserves accounts.
> (4) It supplies data to test the success or prosperity of the business.
> (5) It supplies the basis for analyzing the source of income in addition to the statement of changes in financial position [15:202].

An example of the corporate balance sheet is found in Appendix A.

The income statement provides a review of the factors directly concerned with the determination of the net income: the revenue realized from the sale of goods or services and the costs incurred in the process of producing revenue (34:15). Basically, the statement reveals the net income (or net loss) resulting from the corporation's operations. The statement is an activity statement and shows what the corporation did in dollar terms over a period of time. From the analysis aspect, the leading question that the DOD analyst is concerned with regarding the income statement is "what indication does the earnings record carry as to the future earnings power of the company [15:107]?" An example of an income statement is found in Appendix A.

The statement of retained earnings provides a review of changes in the owners' equity that have been recorded in the Retained Earnings account during a stated period of time (34:66). The information presented in the retained earnings statement is limited to the changes in capital stock, paid-in surplus, and retained earnings. All information that produces the change in retained earnings is found in the income statement. An example of a statement of retained earnings is found in Appendix A.

The statement of changes in financial position, also known as the funds statement, is, in the opinion of the researchers, the most valuable financial statement. This statement shows the flow of working capital[6] during the stated period of time (19:5). The statement summarizes the changes in the working capital and accounts for these changes by showing the sources from which the working capital has been obtained and the uses to which it has been devoted. The importance of a corporation's working capital position will be discussed later in this chapter. An example of the statement of changes in financial position is found in Appendix A.

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[6]Working capital refers to the firm's investment in short-term assets such as cash, securities, inventories, and receivables (62:574). "Net" working capital is the difference between current assets and current liabilities (33:170).

The analysis of the corporation's financial statements as presented in the annual report or reports filed with the SEC is not enough to insure that the analyst has completed a thorough analysis. Roy A. Foulke states, "It is the unusual annual report to stockholders that contains sufficient information for a comprehensive financial analysis [11:41]." The alert DOD analyst should be aware of this fact and of the limitations of corporate financial statements. Myers points out that four important facts with respect to the limitations of the statements are:

> (1) Precision of the financial statement data is impossible because the statements deal with matters that cannot be stated precisely.
> (2) The statements do not show the financial condition of a business, rather they show the position of financial accounting for the business.
> (3) The statements are essentially interim reports, and, therefore, cannot be final because the actual gain or loss of a business can be determined only when it is sold or liquidated.
> (4) Financial statements do not reflect many factors which affect financial condition and operating results because they cannot be stated in terms of money. Such factors include sources of materials and supplies, credit rating of company, and integrity of management and employees [34:26].

The DOD analyst must use these corporate-generated financial statements in performing his analysis; however, he must exercise caution and prudence in the emphasis he places on them. To help the analyst in his dilemma, he should seek out all available and appropriate supplementary information that is provided by independent sources. The three remaining major categories of sources of financial

information concerning aerospace corporations are provided by independent sources and should be sought out by the analyst.

Investment Advisory Service Reports

A wealth of financial information concerning the aerospace industry or a specific aerospace corporation is available in the publications of the investment advisory services. The major services are: Moody's Investor's Service, Standard and Poor's Corporation, and The Value Line Investment Survey (7:129). These services provide a comprehensive flow of bulletins and reports on a daily, weekly, and monthly basis.

The two types of reports issued by these firms that the DOD analyst should make use of when performing an analysis are the aerospace industry analysis reports and the individual reports on a specific aerospace corporation. Both types of reports will be discussed and specific aerospace reports will be identified that should enable the analyst to perform a more comprehensive financial analysis. Emphasis on these reports is to provide supplemental financial information to the analyst.

Aerospace Industry Analysis Reports. For the DOD analyst to properly evaluate an aerospace corporation, he must understand how that specific corporation measures up to the aerospace industry averages. For example, the analyst,

in evaluating Lockheed Aircraft Corporation, determines that that corporation's current ratio is 1.2 to 1. What does that 1.2 to 1 mean? Is it good, neutral, or bad? By comparing that figure to the aerospace industry average of 2.3 to 1, the analyst can conclude that on the basis of current ratio, Lockheed is in a relatively weaker financial position than the "average" aerospace corporation. The same process can be applied to all significant financial ratios and numbers. The important point is that for this analysis to be valid, the specific corporation's figures must be compared to its like-industry averages. One cannot compare Lockheed figures with the public utility industry averages and expect to have meaningful results.

To obtain data for aerospace industry comparisons, the DOD analyst may either research the industry in depth, using a variety of sources, or if he has less time available, as is usually the case, he may turn to one of the investment advisory services. The researchers have identified eight sources of aerospace industry reports and averages that should be of value to the DOD analyst. These reports are:

1. Standard and Poor's Analyst Handbook: "Composite Corporate Per Share Data by Industry"
2. Standard and Poor's Basic Analysis

3. Value Line Investment Survey: "Aerospace Industry"

4. Annual Statement Studies--1976

5. Aerospace Facts and Figures--1976

6. Dun and Bradstreet's Key Business Ratios

7. Leo Troy's Manual of Performance Ratios for Business Analysis and Profit Evaluation

8. Leo Troy's Almanac of Business and Industrial Financial Ratios

An example of several of these reports is included in Appendix B for the reader's perusal. The analyst should review each of these informational sources; and it is recommended that he employ at least two as reference material. However, there is one aerospace report that the DOD analyst should use. This report is Standard and Poor's Basic Analysis report. The report contains data on forty-five industries. Of special significance to the DOD analyst is the annual study of the aerospace industry. This study contains the following topical information for the aerospace industry.

Government Contracting	Helicopters
Military Market	General Aviation
Military Aircraft	Export Market
Missiles	Finances
Space	Composite Industry Data
Propulsion	Company Analysis
Atomic Energy	Plant/Equipment Outlays

Aircraft Engines	Stock Price Charts
R & D	Preferred Stocks
Commercial Transports	Statistical Data (7:158)

The Basic Analysis report is the most comprehensive aerospace informational source found by the researchers. All relevant information is presented in a compact and concise format. It is recommended that the DOD analyst consult this report when performing his analysis. It should also be noted that Basic Analysis and all the other aerospace reports were found at a public library.

Individual Aerospace Corporation Reports. Many investment advisory services publish individual company reports. These reports provide, in summary form, the relevant financial and management information the DOD analyst seeks. Data is provided on sales, operating revenues, common share earnings, recent developments, fundamental position, prospects, dividend data, capitalization, and pertinent balance sheet and income account statistics for the prior ten years (7:162). The individual company reports are dated and are routinely revised every three or four months or more often as developments require. The three major individual company reports provided by the investment advisory services are:

1. Moody's Handbook of Common Stocks
2. Standard and Poor's Stock Reports
3. Value Line Investment Survey

These reports each provide studies on all major aerospace corporations in the United States. In the opinion of the researchers, the DOD analyst cannot perform a comprehensive financial analysis without consulting these sources. An example of a stock report for Lockheed Aircraft Corporation from each of the above investment advisory services is provided in Appendix C. As with the industry averages reports, the individual corporation reports were found in a public library.

Other Aerospace Reports. Many computer-generated reports concerning the aerospace industry and individual aerospace corporations are available from independent, private sources. However, these sources charge a fee for their services. Examples of the data compilation services are Compustat which provides computerized financial data on over 3300 companies, Comparative Analysis which is a custom computerized service that generates financial reports according to the analyst's specifications, the Financial Analyzer which analyzes the quarterly and annual reports of over a 1000 companies (7:135-137). Additional financial analysis services such as Financial Dynamics, Financial

Data Scan, Financial Summary, and Probability Quantification are available to the analyst.

Creditor Reports

Another source of financial information that may be available to the DOD analyst are the credit reports and ratings provided by lending institutions and advisory services. If possible, the analyst should obtain a credit evaluation from the consortium of banks that provide the line of credit to the aerospace corporation. This source would prove invaluable in allowing the analyst to measure the financial strength of a firm. Unfortunately, the researchers were unable to ascertain whether or not this information is available to the analyst.

However, a second type of credit report is available to the DOD analyst that will provide him an indication of the corporation's financial strength and borrowing power. These reports are the evaluations that the investment advisory services perform on the corporation's long-term debt and preferred stock. Moody's Investor's Services, Inc. and Standard and Poor's Corporation assign quality ratings to these types of debt. Both of these services' bond rating systems are essentially the same. Table 4 provides a brief summary of how these services rate the quality of debt for a firm.

TABLE 4

QUALITY RATINGS OF DEBT ISSUES (31:3; 45:5)

Bond Quality	Moody's Rating	S & P's Rating
Highest	Aaa	AAA
Higher	Aa	AA
High	A	A
Medium	Baa	BBB
Low	Ba	BB
Speculative	B	B
Non-Paying	C	C
Default	D	D

Normally, a debt instrument with a quality rating of BBB(Baa) or higher is considered investment grade (7:371). Those rated BB(Ba) or lower are considered to contain a considerable "speculative" element (7:371). The implication of these ratings is that the lower the firm's bond rating, the higher the interest rate the firm will have to pay, and the harder it will be for the firm to obtain funds via this method of financing. By briefly glancing at an aerospace corporation's debt quality rating, the analyst can obtain an indication as to the financial strength and borrowing power of that firm.

Business and Aerospace Publications

The last general sources of financial information covered in this thesis that is readily available to the DOD analyst are the weekly, monthly, and quarterly publications and periodicals that regularly contain articles on aerospace corporations and the aerospace industry. The DOD analyst should review the most relevant publications on a regular, recurring basis so as to keep abreast of the industry's general economic condition. A partial list of publications that should be of interest to the aerospace analyst is:

Aerospace International
Aerospace Magazine
Air Force & Space Digest
American Aviation
Aviation Week & Space Technology
Business Week
Commercial and Financial Chronicle
Defense Management Journal
Dun's Review
Financial Analyst Journal
Financial World
Forbes
Fortune
Harvard Business Review
Journal of Finance
Wall Street Journal

These publications will provide up-to-date information about the aerospace industry and specific aerospace

corporations that has occurred after a corporation's financial statements or the investment advisory services reports have been published.

Summary

In order for the DOD analyst to perform a comprehensive financial analysis of an aerospace corporation, he must obtain the necessary financial information. Sources of financial information available to the analyst are: (1) corporate financial statement, (2) investment advisory services report, (3) creditor reports, and (4) business and aerospace publications. In discussing these sources of financial information, the researchers highlighted several specific reports that should be of particular value to the DOD analyst. These reports were the corporation's 10-K statement, Standard and Poor's Basic Analysis, Value Line's and Standard and Poor's individual stock reports, and Moody's Bond Ratings report. A listing of all the sources of financial information the DOD analyst should obtain before performing his analysis is also presented in Chapter IV under Section I of the financial analysis checklist.

Tools and Techniques of Financial Analysis

Once the DOD analyst has assembled all the pertinent financial information on the aerospace corporation

he is to analyze, his problem becomes one of how to perform a comprehensive financial analysis. This section of the chapter is concerned with identifying the tools and techniques of financial analysis that should be of value to the analyst. Specifically, the items to be discussed are: (1) Ratio analysis, (2) Trend analysis, (3) Cash flow analysis, and (4) Funds flow analysis.

Ratio Analysis

The DOD analyst cannot come to a valid conclusion about the operations of the firm by examining a single financial measure. To answer such questions as, How effectively is the firm utilizing its resources?, How well can the firm meet its current obligations?, Where are the funds for future growth likely to come from?, the DOD analyst can use the technique of ratio analysis to interpret financial statements. By analyzing key financial ratios, the analyst can assess the financial condition of the corporation. Donald E. Miller states,

> . . . the ratio is of major importance in financial analysis because it injects a qualitative measurement and demonstrates the adequacy of one financial-statement item relative to another [29:11].

Miller goes on to state that:

> Ratio analysis involves the study of the total financial picture. The analyst must seek out positive factors that may offset known deficiencies in the financial structure of the company under examination. But he must be equally vigilant in detecting signs of incipient danger that may soon weaken a well-balanced

> company. By basing his conclusions upon a thorough understanding of the importance of each ratio, the analyst can recommend and undertake positive action with confidence [29:181].

Before going into a discussion of the major ratios commonly used, it is very important to call attention to the limitations inherent in ratio analysis. Erich A. Helfert mentions two limitations:

> (1) The most obvious drawback lies in the differences found among the accounting methods used by various corporations, which seriously impact the comparability of many situations, and
> (2) financial statements are based upon past performance and past events, and we must project our evaluation from this basis. The problem is that the past may not predict the future [17:52].

Having sounded this word of caution, the researchers have identified four fundamental categories of financial ratios that should be of use to the DOD analyst. These categories are: (1) Liquidity ratios, (2) Leverage ratios, (3) Efficiency ratios, and (4) Profitability ratios. In each category the researchers, in their opinion, have selected the three ratios that are of most importance to the DOD analyst.

Liquidity Ratios. Liquidity ratios measure the firm's ability to meet its short-term obligations (62:39). The questions that can be studied and answered by the analyst in connection with the liquidity ratios are: Can the company pay its current debts promptly?, Is the amount of working

capital sufficient?, Is the current financial position improving? Kennedy and McMullen state that:

> A business has a strong current financial position if it is able (1) to meet the claims of short-term creditors when they are due, (2) to maintain sufficient working capital for effective normal operations, (3) to meet current interest and dividend requirements, and (4) to maintain a favorable credit rating [19:30].

There are two liquidity ratios that should be of concern to the DOD analyst. These two ratios are: (1) the current ratio, and (2) the quick, or acid test ratio. In addition, the firm's net working capital figure is used to a degree to measure liquidity, though the figure is not a ratio.

Current Ratio. The current ratio (CR) of a firm is the relationship of its current assets (CA) to its current liabilities (CL). In equation form,

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

The current ratio gives the analyst a rough estimate of the financial strength of a prospective contractor to meet its short-term obligations. The ratio also measures the margin of safety provided for paying current debts in the event of a reduction in the value of its current assets (17:54). In addition, the current ratio tells the analyst, to a degree, the degree of safety with which short-term credit may be extended to the firm (19:308).

However, caution should be exercised against overemphasizing the importance of a high current ratio as a measure of a corporation's financial strength. The Accountants' Handbook states:

> Certain unfavorable conditions may be accompanied by an improving current ratio. For example, with a slowdown in business and postponement of programs for advertising, research, and plant and equipment repairs and replacements, a company's cash balance may rise. At the same time, slower customer collections may result in rising receivables, and reduced sales volume may result in rising inventories [64:3:10].

General guidelines for using the current ratio indicate that, to provide a margin of safety, the ratio should be at least 2 to 1, or CA twice as large as CL. Any firm showing a CR of one or less would be one that has potential financial problems (7:392). The 1975 current ratio average for the aerospace industry was 1.9 to 1 (4:106).

Quick, or Acid Test Ratio. The quick ratio (QR) measures the current assets minus inventories against current liabilities:

$$\text{Quick Ratio} = \frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$$

This ratio concentrates on the immediate liquidity of the firm. Inventories are eliminated from current assets because some time may elapse before inventories can be converted into cash. "Consequently, when analyzing the

liquidity of a firm, the quick ratio is indicative of a firm's capability to meet current obligations as they become payable [29:23]."

A general rule of thumb for a manufacturing firm is a QR of 1 to 1. A result below 1 to 1 can be a warning signal that the firm is experiencing financial difficulties. The 1975 QR average for the aerospace industry was 0.9 to 1 (4:106).

Net Working Capital. The net working capital (NWC) is the excess of current assets over current liabilities. In equation form:

Net Working Capital = Current Assets - Current Liabilities

This value represents an index of financial soundness or margin of protection for current creditors and future current operations (34:97). The importance of NWC is that it should be sufficient enough to enable the corporation to conduct its business on the most economical basis without financial stringency and to meet emergencies and losses without danger of financial disaster (19:263). Therefore, the key point for the analyst is that he should be alert for an inadequacy of working capital. Since NWC is measured in dollars, a minimum dollar figure is meaningless. NWC should be used in conjunction with the current and quick

ratios when determining the overall financial liquidity of the firm.

Leverage Ratios. Leverage ratios measure the extent to which the firm has been financed by debt (62:40). These ratios enable the analyst to express the balance between all borrowed funds, i.e., debt, and those funds belonging to the owners of the corporation, i.e., equity. Weston states that leverage ratios have three major implications:

> First creditors look to the equity, or owner-supplied funds, to provide a margin of safety. If the owners have provided a small proportion of financing, the risks of the enterprise are borne mainly by the creditors. Second, by raising funds through debt, the owners gain the benefits of maintaining control of the firm with a limited investment. Third, if the firm earns more on the borrowed funds than it pays in interest, the return to the owners is magnified [62:43].

There are three leverage ratios that should be of concern to the analyst. These three ratios are: (1) the debt ratio, (2) the current liabilities to tangible net worth ratio, and (3) total debt to tangible net worth.

Debt Ratio. The debt ratio compares both the short-term and long-term liabilities of the firm to the firm's total assets (17:57). In essence, the debt ratio measures the percentage of total funds that have been provided by creditors. This ratio is computed as follows:

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

The significance of this ratio is that not only does the firm have to meet short-term obligations, but also those of a longer term nature. The implication is that a firm carrying a high debt burden is placed under financial stress and, as a result, experiences a loss of flexibility in its management decisions.

In 1960, the average debt ratio for the aerospace industry was 21 percent (12:60). Since then the average industry debt ratio steadily increased to its present 1975 average of 62 percent (28:87).

Current Liabilities to Tangible Net Worth Ratio. The tangible net worth of a corporation is that value remaining after subtracting total liabilities and goodwill from total assets. An easier method of computing tangible net worth is to subtract goodwill from stockholders' equity (62:571). From this, the analyst can calculate the current liabilities to tangible net worth ratio (CL/TNW):

$$\text{CL/TNW Ratio} = \frac{\text{Current Liabilities}}{\text{Stockholders' Equity - Goodwill}}$$

The CL/TNW ratio shows the percentage of funds contributed by short-term creditors in relation to the owners of the firm. In addition the ratio demonstrates the ability of the firm to decrease assets in order to pay current obligations (11:207). In 1975, the aerospace industry had an average CL/TNW ratio of 59.5 percent (9:8).

Roy A. Foulke states that "a firm should be studied closely if the current liabilities exceed three-quarters of tangible net worth [11:229]."

Total Debt to Tangible Net Worth Ratio. Again, the total debt to tangible net worth ratio (TD/TNW) is another measure showing ownership of the firm. This ratio measures the percentage of funds contributed by all creditors in relation to the owners' contribution. In equation form:

$$\text{TD/TNW Ratio} = \frac{\text{Total Liabilities}}{\text{Stockholders' Equity - Goodwill}}$$

The DOD analyst should exercise caution in interpreting an aerospace corporation's TD/TNW ratio. Normally, a TD/TNW ratio in excess of 100 percent indicates a high degree of risk being shouldered by the firm's creditors and the firm could have problems in arranging new debt financing (11:253). However, the analyst should consider what portion of that total debt in the TD/TNW ratio is long-term debt since long-term debt does not have to be repaid immediately. The aerospace industry is highly leveraged and places great emphasis on long-term debt to finance its operations. In 1975, the aerospace industry had an average TD/TNW ratio of 116.8 percent (9:8).

The important point is that the TD/TNW ratio and the other two leverage ratios should be analyzed together.

Independently analyzed, each ratio by itself could lead the analyst to an erroneous conclusion.

Efficiency Ratios. The efficiency ratios measure how efficiently the corporation is using its resources. The importance of efficiency ratios is that these ratios determine the level of working capital a corporation must maintain (19:266). In general, an aerospace corporation experiences relatively slow turnover of its inventories and receivables. This fact requires the firm to maintain a large working capital position. A shortage of funds could impact seriously on the overall operations of the firm. An example of a corporation that felt the impact of not maintaining an adequate working capital position is Lockheed Aircraft Corporation. In the spring of 1970, Lockheed was on the brink of bankruptcy due to a cash flow shortage (22:27). Problems in the L-1011 and C-5A programs delayed the inflow of revenues. Consequently, the corporation could not meet its large short-term financing commitments. To prevent bankruptcy of Lockheed, the Government guaranteed to repay additional bank loans to Lockheed in the event the corporation defaulted (22:14-17).

To aid the analyst in determining if the firm's working capital position is sufficient, there are three efficiency ratios that are useful in this task. These ratios are: (1) the inventory turnover ratio, (2) the

receivables turnover ratio, and (3) the net working capital turnover ratio.

Inventory Turnover Ratio. The inventory turnover ratio (ITO) denotes the efficiency of capital invested in inventory and the speed of inventory disposition (18:37). The ratio is computed as follows:

$$\text{Inventory Turnover} = \frac{\text{Net Sales}}{\text{Inventory}}$$

An analysis of the firm's inventory is critical because of its effect on the firm's working capital position. A firm that is exhibiting a lower ITO ratio than in previous years, or in relation to its industry average, is most likely experiencing a higher risk due to decline of price, changes in demand, or changes in style; also, there is more cost involved in carrying the inventory, and excess stocks are unproductive and represent an investment with a low or zero rate of return (19:268). The result is that the firm must maintain a larger working capital position at a higher cost.

The aerospace industry is characterized by its low inventory turnover in relation to other manufacturing industries. In 1975, the industry's average ITO ratio was 3.6 times. Foulke makes a point that a decreasing ITO ratio is one of the leading indicators of potential financial problems for the firm (11:331).

Receivables Turnover Ratio. The receivables turnover ratio (RTO) measures the firm's efficiency of capital invested in accounts receivable (62:47). The ratio represents the number of times that the accounts receivable were turned over in one year. The ratio is computed as follows:

$$\text{Receivables Turnover} = \frac{\text{Net Sales}}{\text{Receivables}}$$

From this turnover, the analyst can then determine the firm's average collection period, or the average length of time that the firm must wait after making a sale before receiving cash. The average collection period is:

$$\text{Average Collection Period} = \frac{\text{365 Days}}{\text{Receivables Turnover}}$$

The implication of an increasing RTO ratio is obvious. Receivables, like any other asset, must be financed, and holding them represents a cost to the firm (21:60). It follows that the lower the RTO ratio, the higher the amount of receivables, the higher the cost to the firm, and, finally, the larger the working capital position that must be maintained. In 1975, the aerospace industry's average collection period was 52 days and average RTO ratio was 7.0 times (9:8).

Net Working Capital Turnover Ratio. As sales increase, the investment in inventories and receivables

normally increases, and, therefore, a larger amount of working capital is needed. The net working capital turnover ratio (NWCTO) allows the analyst to measure the efficiency of the firm's working capital. The turnover shows the number of dollars of net sales the business obtained for each dollar of working capital (11:435). The ratio is computed as follows:

$$\text{NWCTO} = \frac{\text{Net Sales}}{\text{Working Capital}}$$

Kennedy and McMullen state that "a low turnover of working capital may be the result of an excess of working capital, or a slow turnover of inventories and receivables [19:327]." All the preceding reasons translate into higher costs and lower efficiency for the firm. In interpreting the NWCTO ratio, the analyst should exercise caution. Increasing sales can increase the NWCTO ratio and give the impression that the firm is financially healthy. For this to be true, the increased sales should be accompanied by a healthy collection period, moderate inventories, moderate fixed assets, and sufficient net working capital (11:434). In 1975, the aerospace industry's average NWCTO ratio was 3.94 to 1 (9:8). As in the other ratios discussed so far, the NWCTO becomes more meaningful when analyzed for a series of years.

Profitability Ratios. The profitability ratios of a firm measure the management's overall efficiency as shown by the returns generated on sales and investment (62:40). These ratios provide the basis to answer the question, Is the company's management utilizing capital funds profitably? Though the amount of profit is not of great concern to the DOD analyst, the determination of the firm's profitability is. For a firm to remain a business enterprise, it must at least break even in terms of profits and losses over the long term. In essence, the DOD analyst, by measuring the firm's profitability, is measuring the firm's staying power to remain in business. The government can ill afford to have an aerospace contractor declare bankruptcy and stop production during the development of a vitally needed weapons system.

There are three important profitability ratios that should be of concern to the DOD analyst. These three ratios are: (1) the net profit margin, (2) return on total assets, and (3) return on net worth.

Net Profit Margin. The net profit margin (NPM) shows the relationship of the firm's profits to the sales volume attained by giving the percentage of profit for every dollar of sales. Helfert states that "this ratio helps the analyst appraise the efficiency of operations, although such considerations as pricing and volume

fluctuations may limit its reliability [17:64]." However, the profit margin indicates the magnitude of the margin of protection against losses resulting from falling prices, rising costs, or declining volume (62:49). The firm's profit margin is computed as follows:

$$\text{Net Profit Margin} = \frac{\text{Net Profits}}{\text{Net Sales}}$$

In 1975, the profit margin on sales for individual aerospace corporations ranged from 1.43 percent to 6.39 percent with an industry average of 4.5 percent (9:8). To put it another way, the average aerospace corporation had to sell approximately $22 of goods in order to realize $1 of net profits.

Return on Total Assets. The return on total assets, more commonly known as the return on investment (ROI), measures the percentage earned on total invested capital (15:231). Depending upon the analyst's point of view, there are two methods for calculating ROI. If the analyst takes the position of a stockholder, he is interested in the earnings after interest and taxes belonging to him relative to the company's assets. This ROI ratio is calculated by the following formula:

$$\text{Stockholder's ROI} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

If the analyst takes the position of an outside analyst, interested only in appraising the earnings power of the company's assets, as should be the case for the DOD analyst, he will calculate the firm's ROI as follows:

$$\text{DOD Analyst's ROI} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Assets}}$$

This ratio measures the earnings of the firm on all its assets, before taxes and compensation of the various contributors of these assets (creditors and stockholders) (17:63). Benjamin Graham states that:

> The fundamental merit of the [DOD analyst's ROI ratio] is that it measures the basic or over-all performance of a business in terms of the total profits by all long-term investors, rather than a single class [15:234].

The researchers believe that the ROI ratio is the most crucial ratio test of business profitability because of the function that rate of return plays in our economy. Essentially, capital and resources will flow to individual corporations and specific industries that will yield to investors the greatest rate of return. Eugene Lerner states the function of rate of return this way:

> If an industry has a high rate of return, it can afford to pay high wages to its employees and so both hold and expand its labor force; and it can afford to purchase new plant and equipment and thereby increase its output. If an industry's return is not competitive, it will lose the financial capacity to attract resources; its growth will cease and the industry may decline [21:48].

In 1975, the return on investment for individual aerospace corporations ranged from 3.9 percent to 16.4 percent with an industry average of 11.1 percent (4:106). From the above, it can be inferred that aerospace corporations on the lower end of the rate of return range will find it more difficult to raise capital than those corporations at the higher end of the scale.

Return on Net Worth. Return on net worth, also known as return on owners' equity (ROE), is another measure of business profitability. ROE appraises the earning power of the investment of the owner by measuring the rate of return on the net worth of the company (62:49). This ratio is calculated as follows:

$$ROE = \frac{\text{Net Profit}}{\text{Net Worth}}$$

A low percentage return to the investors in the company is often considered to be a sign of actual or potential financial weakness. The results to a company with a low ROE in relation to the industry average are the same as was discussed in the ROI section, i.e., a loss in capital investment and eventual corporate decline. In 1975, the return on owners' equity for individual aerospace corporations ranged from 5.43 percent to 17.9 percent with an industry average of 11.75 percent (9:8).

Summary. The individual ratios, which are summarized in Table 5, should give the DOD analyst a reasonably good impression of an aerospace corporation's financial strengths and weaknesses. Besides these ratios, there are numerous others which can be useful in determining the financial viability of a prospective contractor. However, our purpose is to suggest some of the ratios that are beneficial for the purposes of analysis, not describe all ratios available. Our omission of any particular ratio should not be interpreted as disapproval. For in reality, any ratio that the DOD analyst finds useful to him is a ratio that has value.

Ratio analysis of a corporation would be incomplete if it ignored the dimension of time. An analysis of all the ratios of the firm over a period of time will complement the ratio analysis for one year and provide a more meaningful appraisal of the firm's financial health. The specific technique that shows financial ratios over a period of time is trend analysis.

Trend Analysis

Trend analysis of ratios is the study of financial ratios of a firm over a period of time. The technique of trend analysis allows the DOD analyst to evaluate what the firm has done in the past and to draw conclusions as to the possible direction in the future. The analysis provides

TABLE 5

SUMMARY OF FINANCIAL RATIOS

Ratio	Formula	1975 Aerospace Industry Average
I. Liquidity Ratios		
1. Current	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	1.9 times
2. Quick	$\frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$	0.9 times
II. Leverage Ratios		
3. Debt	$\frac{\text{Total Debt}}{\text{Total Assets}}$	65%
4. Current Debt to Net Worth	$\frac{\text{Current Liabilities}}{\text{Net Worth}}$	59%
5. Total Debt to Net Worth	$\frac{\text{Total Debt}}{\text{Net Worth}}$	116%

TABLE 5--Continued

Ratio	Formula	1975 Aerospace Industry Average
III. Efficiency Ratios		
6. Inventory Turnover	$\frac{\text{Net Sales}}{\text{Inventory}}$	3.6 times
7. Receivables Turnover	$\frac{\text{Net Sales}}{\text{Receivables}}$	7.0 times
8. Working Capital Turnover	$\frac{\text{Net Sales}}{\text{Working Capital}}$	3.9 times
IV. Profitability Ratios		
9. Profit Margin	$\frac{\text{Net Profit}}{\text{Net Sales}}$	4.5%
10. ROI	$\frac{\text{Earnings Before Interest and Taxes}}{\text{Total Assets}}$	11.1%
11. ROE	$\frac{\text{Net Profit}}{\text{Net Worth}}$	11.7%

a directional perspective to the financial data and ratios (7:456). Since the series of ratios indicate the trends of the various financial factors of the business across the years, they provide a horizontal analysis of comparative statements, a dynamic study of the behavior of the factors with the passage of time (34:154). These trends may indicate that a relatively good present position is being rapidly eroded. Conversely, an analysis of the ratios over the past few years may suggest that a relatively weak position is being improved.

The most common method utilized in trend analysis is the graph. The visual display of the ratios taken over time makes it easy to identify the major trends in the data. To obtain an even clearer picture as to what is happening to the firm's financial health, the analyst should plot the industry average ratio along with the corporation's ratio. To illustrate, Figures 1 and 2 show the benefit of plotting both series of ratios.

As can be seen, the graphical presentation of the firm's ratio over a period of time demonstrates vividly the importance and power of trend analysis. The information provides a basis on which the analyst can make an intelligent appraisal of a firm's financial health.

There are several statistical techniques that can be used in trend analysis to plot projections of ratios

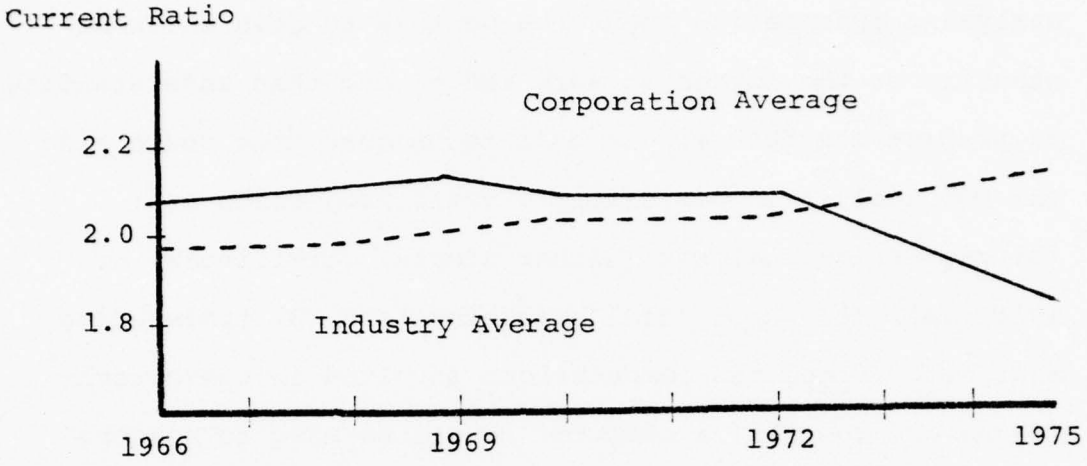


Figure 1

Illustration of Trend Analysis--Current Ratio

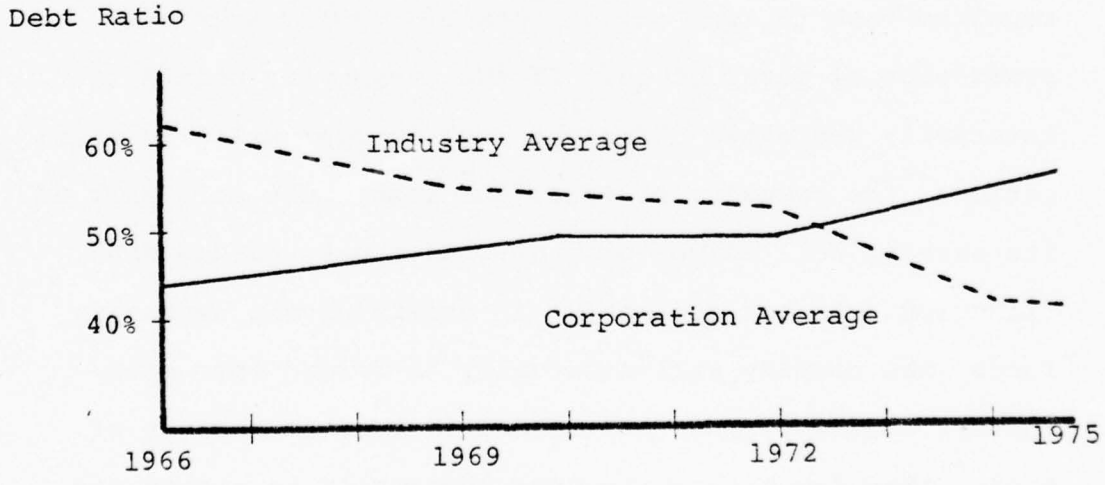


Figure 2

Illustration of Trend Analysis--Debt Ratio

and financial statement items. The analyst's purpose in analyzing information about the past is to gain an understanding of the forces at work and to use that understanding to predict the future. Several techniques that could aid the DOD analyst in performing a trend projection are: (1) regression analysis (either simple, curvilinear, or multiple), (2) exponential smoothing, and (3) time-series analysis. Since the computations involved in these techniques are complex, a computer should be used to perform the analysis.

Cash Flow Analysis

Cash flow analysis is another technique of financial analysis with which the DOD analyst should be familiar. The operation of a business revolves around cash. The company receives cash from the sale of goods, while it requires cash to meet obligations associated with the production of those goods. If the company is unable to internally generate sufficient cash to meet existing obligations, the company, to raise the cash, must sell part of its assets, sell common or preferred stock, or use debt financing. If not successful in obtaining the necessary funds, the company will eventually be forced into bankruptcy. While firms often resort to outside sources of funds, they depend heavily upon internally generated cash flows to meet cash requirements (17:35). However, access

to outside funds depends greatly upon the level of internally generated cash flows. The more cash the firm can generate from internal sources, the greater the firm's ability to generate funds from outside sources. Cash flow analysis, then, is a technique of looking at a firm's financial statements in terms of cash inflows to cash outflows.

Net operating cash flow is defined as "net income plus noncash expenses such as depreciation, depletion, and amortization [18:238]." Therefore, net income, i.e., profit, is not equivalent to cash flow. This distinction is important because it is cash (not profits) that pays the bills. Helfert states that profits differ from net operating cash flows in that

> 1. certain expense items, i.e., depreciation, do not involve the outlay of cash.
> 2. income and expense items commonly accrue before (and after) they are reflected in cash flows.
> 3. profits are reported net of interest expense even though the latter is a financial charge and is excluded from net operating cash flows [17:42].

The net operating cash flow is analyzed in terms of appraising the firm's ability to meet the fixed charges against it. Fixed charges of the firm include payments of principal and interest on short- and long-term debt and dividends on preferred stock (18:238). These items must be paid for with cash. Therefore, the analysis of cash flow should concern itself with determining the expected flows in terms of the requirements to service the

fixed charges. It is obvious that the firm, over the long term, should have at a minimum a cash flow to fixed charges ratio of 1 to 1 if it wishes to stay in business. There is no general rule as to what a firm's cash flow coverage of fixed charges should be, but one prominent banker had this to say:

> The amount of net cash flow available to service fixed charges should probably equal 150% to 200% of the amount required, depending on the stability of cash flow and the adequacy of working capital [18:238].

Cash flow analysis allows the analyst to determine a corporation's net operating cash flow and the effects this balance has on future growth, expansion, and dividend payments of the company. In particular, the DOD analyst determines what effect the contract requirements will have on the cash flow of the prospective contractor. A few questions the DOD analyst should ask are: Is the contractor's present cash flow adequate to meet the financing requirements of the contract? If not, will the government have to provide unusual progress payments or guaranteed loans to meet the contractor's cash flow inadequacy?

Funds Flow Analysis

Funds flow analysis utilizes the statement of changes in financial position for the purposes of determining the changes in the financial condition of a business enterprise between two dates (11:473). This type of analysis is broader in context than the cash flow analysis.

Whereas, cash flow analysis is concerned only with the flow of cash assets within the firm, funds flow analysis is concerned with the changes in all asset and liability accounts over a period of time. Funds flow analysis is also frequently called the analysis of sources and applications of funds.

The importance of funds flow analysis to the DOD analyst is that the analysis allows an appraisal to be made of the impact and quality of the management decisions made in the business during a given time period. The analysis will show where management decided to commit funds (applications), where to reduce its investments (sources), or where to acquire additional funds (sources) (17:6). In essence, the analysis provides a picture of management's handling of capital. The analysis also provides answers to several questions that should be of concern to the DOD analyst. These questions include:

1. Where did profits go?
2. Why were dividends not larger?
3. How was it possible to distribute dividends in excess of current earnings, or in the presence of a net loss for the period?
4. Why are the net current assets down although the net income is up?
5. How is it that the net current assets are up even though there was a net loss for the period?
6. Why must money be borrowed to finance purchases of new plant and equipment when the required amount is exceeded by the "cash flow" (the sum of the net income and depreciation)?
7. How was the expansion in plant and equipment financed?

8. What happened to the proceeds of the sale of plant and equipment resulting from a contraction of operations?
9. How was the retirement of debt accomplished?
10. What became of the assets derived from an increase in outstanding capital stock?
11. What became of the proceeds of the bond issue?
12. How was the increase in working capital financed [59:3:38]?

The analysis of a corporation's flow of funds was made easier for the analyst when the Accounting Principles Board issued Opinion 19 in March, 1971. Kennedy and McMullen stated that Opinion 19 required that all important events during the year having a bearing on the financial position of the firm must be disclosed to the public (19:284). This change now allows the analyst to evaluate the effectiveness of the corporation's financial policies with a greater degree of precision.

An additional benefit to the analyst can be derived from the analysis of the firm's statement in changes of financial position. Kennedy and McMullen summarize this benefit as:

> Using budget procedures, the statement of funds may be projected into the future, in which event it becomes a working capital budget. Therefore, through disclosure of the factors affecting working capital in the past, the statement is an important instrument in the control of working capital and in the effective utilization of resources in the future [19:286].

The ability of the analyst to project the future financial position of a prospective contractor with some degree of accuracy is important. The tools and information

required to make this projection and the implications of this analysis will be discussed in the following section.

Financial Forecasting Techniques

In the preceding sections, a discussion of ratio analysis, trend analysis, cash flow, and funds flow was presented with the aim of appraising the past and current financial performance of a corporation. However, the analyst should understand that the firm's future performance is the real criteria for success and credit worthiness. In view of these considerations, an important task of the analyst is that of financial forecasting, which, as Helfert states, "*is a systematic projection of the expected* actions of management in the form of schedules, budgets, and financial statements [17:78]." Financial forecasting can aid the DOD analyst in many ways. Some uses and benefits of financial forecasting are:

1. It can be useful in reducing financial surprises.
2. It can be used to set standards of performance to measure actual performance.
3. It can be used to anticipate upcoming financial needs.
4. It can be used to determine if management is aware of future financial needs and problems.
5. It can be used to assess the firm's future financial position and capability [7:128].

There are two widely used methods of forecasting the financial needs of a corporation: (1) the cash flow forecast, and (2) the pro forma financial statements. A third forecasting tool, the sales forecast, allows the

analyst to derive and evaluate the first two financial forecasting methods. An understanding of these methods should enable the DOD analyst to better assess the financial strength and capability of the prospective aerospace contractor.

Sales Forecast

Before an analyst can begin to evaluate the future financial needs of a firm, he must either perform a sales forecast of the firm or analyze the sales forecast prepared by the firm. The importance of the sales forecast should be obvious. Since sales represent the primary source of cash receipts, the operations of a firm are normally geared to the anticipated volume of sales (18:131). If that anticipated volume of sales exceeds the firm's present plant capacity, the firm has to generate more cash and sources of financing for equipment replacement and/or expansion to meet that future demand, or it can limit sales and not expand. Conversely, if future sales are not expected to exceed present plant capacity, the cash requirements of the firm may not be as great. Therefore, a good sales forecast is an essential foundation for forecasting a firm's financial requirements.

Normally, the DOD analyst does not have access to the specific market and product information that would enable him to construct a sales forecast for the firm.

The prospective contractor will furnish a sales forecast to the analyst, but the problem then becomes one of validity and reliability of the forecast. Short of becoming a market analysis expert, the DOD analyst has available to him an alternative method for determining the validity of the corporation's forecast. By consulting Value Line's and Standard and Poor's stock reports on the contractor, the analyst can compare these sales forecasts to the firm's forecast. From this analysis, the analyst should have a fairly accurate and reliable sales forecast that he can use to base his evaluation of the firm's financial requirements. To make this evaluation, the analyst should use one of the two financial forecasting tools: (1) the cash flow forecast, or (2) the pro forma financial statements.

Cash Flow Forecasts

The most basic and comprehensive method of predicting the amount and time of future funds needs is through preparation of a cash flow forecast or, as it is sometimes called, a cash budget (18:129). As defined by Weston, the cash budget is "a schedule showing cash flows (receipts, disbursements, net cash) for a firm over a specified period of time [62:568]." The forecast is used to predict when and in what quantity receipts of cash will come into the firm and when and in what quantity payments of cash will be made. An analysis of cash flow forecast allows the analyst to

determine the firm's financial requirements for future operations. A positive net cash flow will indicate that the firm has some internal financing capability. However, if a negative net cash flow, i.e., outflows of cash exceed inflows, is indicated, the firm will require additional financing from external sources unless cash is available (17:88).

The prospective contractor, by request from the analyst, will provide a cash flow forecast that incorporates the effects of the contract to be let. From this forecast, the analyst can determine the amount of the contractor's financial requirements. If a substanial portion of the cash required is to be externally financed, the analyst, from his analysis of the corporation's present financial position, can determine if the contractor is capable of borrowing that amount, and, ultimately, if the contractor is financially capable to successfuly complete the contract.

The cash flow forecast can be a useful tool to the DOD analyst if he allows for its inherent limitations. Since the forecast is based on best estimates of what can be expected in the future, the results should not be considered inviolable (17:96). Additionally, the forecast is based on a single set of plans which may and probably will change over the forecasted time period. To help overcome these limitations, the analyst may find it useful to forecast a cash flow for the best and worst possible outcomes

and to forecast a series of cash flows based on the alternative plans available to the corporation.

Pro Forma Financial Statements

The pro forma financial statements are the projections of the firm's current financial statements given a set of proposed transactions such as additional acquisitions, new financing, consolidation, recapitalization, or reorganization (19:37). The two statements that should be of concern to the analyst for purposes of financial forecasting are the income statement and the balance sheet. As was previously discussed, the income statement shows the differences between the flow of revenues and costs for a stated period, and the balance sheet indicates the value of the firm's assets, liabilities, and equity at a moment in time. By forecasting the proposed changes in operations of the firm, the analyst can develop and analyze an income statement for the period under study and a balance sheet as of the end of the period.

As in the case of the cash flow forecast, the DOD analyst normally does not have access to the specific information (i.e., corporate plans, market analyses, etc.) required to develop pro forma statements. These statements will be provided by the prospective contractor and can be verified for validity by comparing them to estimates made by independent investment advisory services. A particularly

good source that can be useful in solving this validity problem is the Value Line Investment Survey. The survey provides one, two, and five year projections for the key ratios and accounts (i.e., long-term debt, working capital, etc.) of the corporation.

Upon verification of the pro forma statements, the analyst can apply the traditional methods of financial analysis to analyze the projected financial position and operating results of the corporation. Helfert states that,

> . . . the importance of pro forma statements lies in appraising the funds needs or generation of the enterprise at a specific point in time, its financial strength and weakness, the effect of growth or retrenchment, and the effect of changing policies over time. They also present the future relationship of assets, liabilities, revenues, costs, and profits, and thereby can be interpreted [17:86].

The pro forma statements are also not without limitations. Because these statements are forecasts, errors in estimates can be expected. Additionally, there is the risk that the pro forma statements, as rather sweeping summaries of individual transactions and fluctuations in the volume of operations, may obscure sizable funds needs or financial crises which can occur between the balance sheet dates (17:87). In this case, the analyst must rely on his experience and judgment regarding the choice of periods and date for analysis.

Corporate Financial Policy

Any financial analysis of a corporation would be incomplete without an examination of the corporate policy intended to guide future operations. Just as DOD is continually making short- and long-range plans to accomplish national security objectives, so too is the corporation planning to achieve its corporate objectives. The role of financial planning in the area is critical. It is with capital that the firm purchases raw materials, processes them to finished goods and exchanges the finished goods for capital in excess of the original investment. Joseph Stiglitz suggests there are four decisions the firm must make when considering this cycle:

> (1) Which projects should the firm undertake?
> (2) How should the firm finance its investment?
> (3) How much should the firm invest?
> (4) How should the firm distribute its income [49:851]?

In the language of finance, these decisions would be referred to respectively as (1) the Capital Budgeting Decision, (2) the Capital Structure or Debt/Equity Financing Decision, (3) the Capital Investment Decision, and (4) the Dividend Policy Decision. The analyst should be aware of the circumstances surrounding each of these decisions and the possible impact upon USAF procurement.

Capital Budgeting Decision

As previously mentioned, the capital budgeting decision is a determination of which projects the firm

should undertake. Mr. Erich Helfert has stated that the decision as to which project to accept is a balance of the sources and cost of capital, measured against the most economic use of capital to achieve specific objectives. The entire decision process is made under conditions of risk (17:141). The complete process is illustrated in Figure 3.

The capital budgeting decision applies to many different areas. Helfert mentions outlays for plant, equipment, or new product lines (17:143). If the decision is put in the context of DOD contracts and a firm in the aerospace industry, the decision may be whether to bid on the F-16 airframe contract, the F-15 airframe contract, or neither. To aid in this decision, numerous techniques have been developed.

The techniques used to determine which projects to accept fall into two basic categories: (1) Payback Period and (2) Discounted Cash Flow Techniques. The payback period is ". . . the number of years it takes a firm to recover its original investment from net returns before depreciation but after taxes [62:144]." On the other hand, discounted cash flows recognize the "time value" of money. This means that a dollar today is more valuable than a dollar promised at some future date. The dollar today is more valuable because it can be invested and earn interest until the time that future dollar is delivered.

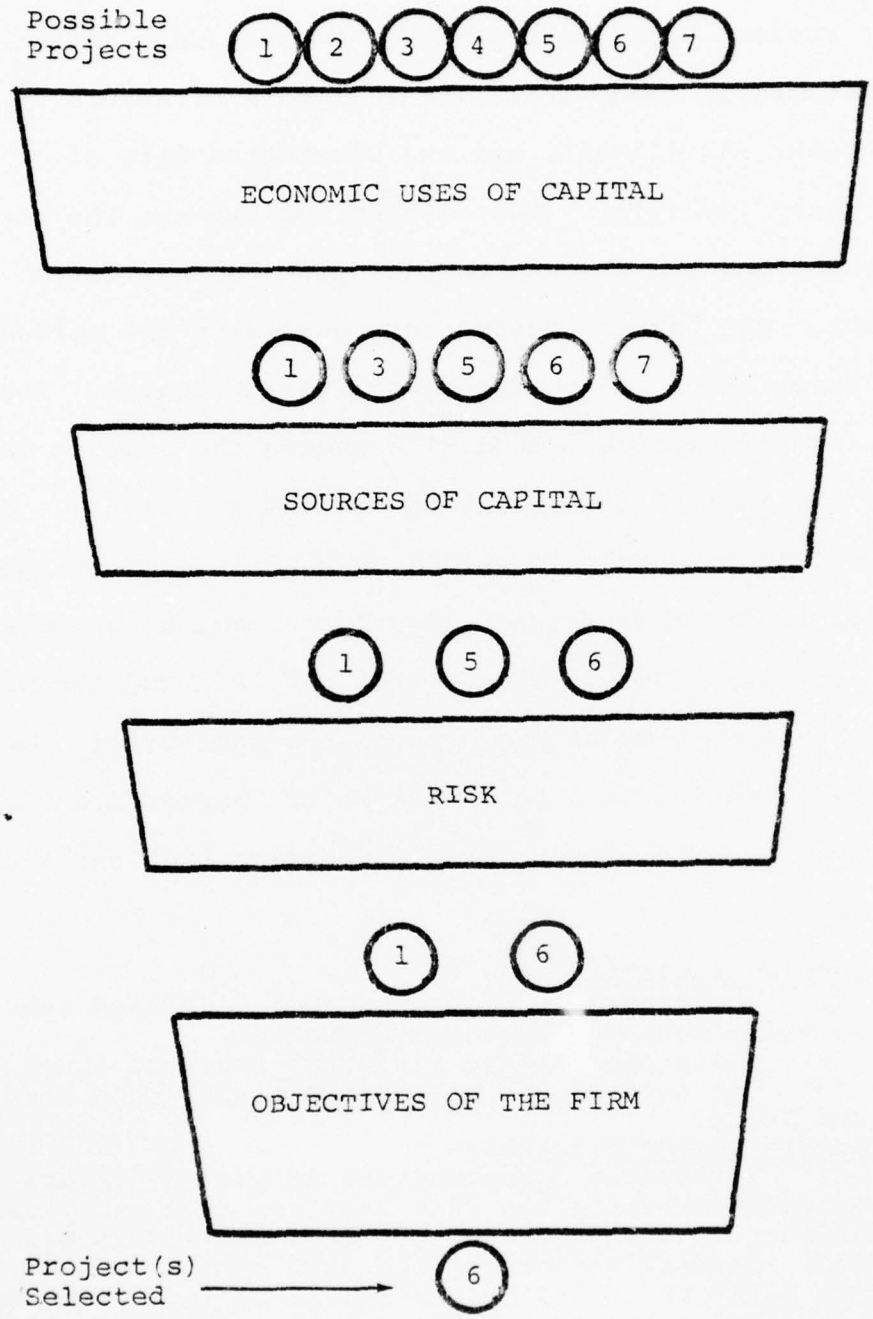


Figure 3

The Captial Budgeting Decision (13)

Examples of discounted cash flow techniques are: the Net Present Value Method (NPV), Benefit/Cost ratio or Profitability Index (PI), Internal Rate of Return method (IRR) (62:143-44), and the Discounted Rate of Return method (33:518). The distinction between the payback method and the discounted cash flow techniques is important. The payback method only considers the period during which the firm would recover its investment. The firm using the payback method will choose the project that returns the initial investment the quickest (33:519). One possible problem with this method is that it ignores the stream of income that extends beyond the maximum payback period (62:144). Weston states that NPV, PI, and IRR will normally rank a group of projects in the same order; however, the following is a partial list of characteristics which may cause a different order depending upon the technique used:

Project Characteristics--

(1) The cash flow of one project increases over time, while that of the other decreases.

(2) The projects have different expected lives.

(3) The cost of one project is higher than that of the other.

Corporate Characteristics--

(1) Investment opportunities in the future are expected to be different than they are this year, and the direction of change (better or worse) is known.

(2) Capital rationing [the firm has imposed a strict limit on capital expenditures or it is imposed externally due to limited sources of capital (62:166)] is being imposed on the firm [62:150].

One or all of the characteristics may apply to an aerospace firm evaluating possible investment decisions. It is not practical to analyze all the combinations possible and their ramifications. However, the individual analyst should be prepared to investigate the application of these techniques as the firm uses them to rank projects, and the objectives of the firm which lead to project selection. The objectives may be the key to reconciling the economic ranking provided by capital budgeting techniques and the actual project chosen. Fox mentions that some contractors will underbid on DOD contracts just to get a "foot in the door" (12:276). This situation is analagous to a firm that says project A is economical only if we accomplished it at price P or greater; however, we will submit a bid at lower than price P because other benefits may be derived from having this contract in particular or another DOD contract in general. Although the final selection coincides with the contractor's objectives, it may not meet DOD objectives. In this example, the contractor may perceive the requirements of the project as being poorly defined and requiring numerous changes. Therefore, once he has the contract he can renegotiate the price because of the number of contract changes required to definitize the work to be accomplished (12:276). Recognition that the final project selection does not agree with the capital budgeting technique used will not tell the analyst that this situation exists.

However, it does indicate that the interface between the capital budgeting decision and corporate objectives should be closely examined. Whichever project(s) the firm selects, the next decision must be how to finance the project.

Capital Structure and Debt/ Equity Financing

A firm's capital structure can be said to be comprised of permanent financing which is usually composed of common stock, preferred stock, retained earnings, and long term debt (41:445). A general classification can be made by grouping the methods of financing as debt (long-term; short-term credit is excluded (62:249)), or equity. A simplified approach to the difference between the types of financing is that providers of equity capital share in the ownership of the firm, whereas those who provide debt financing receive their principle plus interest. Some of the forms debt can take are bonds, term loans, leases, warrants, and others. Equity financing is composed of common stock, retained earnings, or preferred stock.[7] While it is beyond the scope of this research to examine each form of debt or equity individually, the general mix of debt/equity financing is examined as the building block of capital structure.

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[7]Preferred stock has some of the characteristics of both debt and equity financing. The authors have taken Weston's view that a creditor looking at the firm considers preferred stock an equity (62:250).

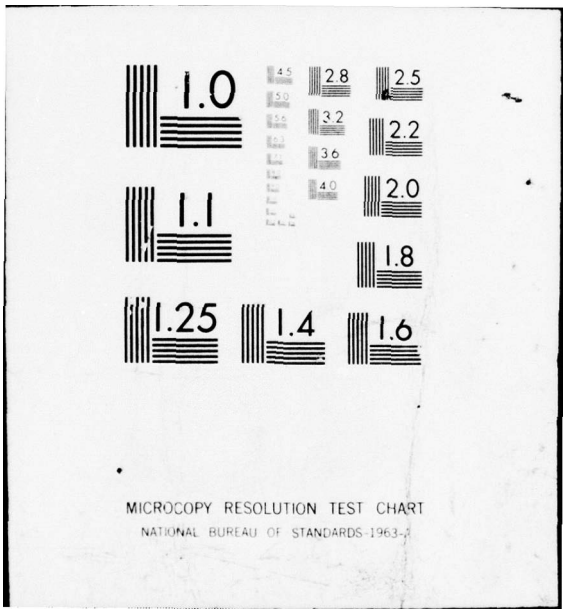
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J. N. Philips states that a firm's capital structure depends upon: (1) the nature of assets and the way they are managed, and (2) the availability and cost of different types of capital (39:841). With respect to "Nature of assets," the primary emphasis is placed upon major assets such as those discussed under the capital budgeting decision (i.e., plant, equipment, etc.). The "availability" of different types of capital refers to the relative ease with which funds can be raised through debt or equity financing. The "cost of capital" is defined as ". . . the cost associated with the use of a particular block of funds raised from a single source, either by a single security issue or a package of securities [43:96]." This means that the cost of capital can be segmented into a cost for preferred stock, a cost for retained earnings, or a cost for any type of financing (62:303). An example of the cost of debt financing is the periodic cost of interest. The cost also depends on the amount of debt to be financed and the soundness of the firm. The cost of a new issue of common stock would be determined by the number of shares of stock that must be offered and sold to obtain a specified amount of capital. The problem is in projecting the cost of capital and how this affects the firm. For example, a new equity issue will dilute the ownership of the firm.

The possible combinations of cost and availability of different forms of capital financing will normally lead the firm to base its debt/equity mix on the average cost of capital (62:301). G. David Quirin has presented this decision graphically (Figure 4). Figure 4 illustrates a range of debt/equity ratios for which there is little variation in the cost of debt or equity. The relatively constant cost of debt and equity allows the firm to gradually reduce its average cost of capital. The reduction in the average cost of capital continues until at some debt/equity ratio the component cost of debt and equity start to increase rapidly. Quirin and Weston agree that the optimal debt/equity mix is that point at which the average cost of capital is a minimum (43:126; 62:313). Even with an optimal point for operations, it is important to remember that a firm's capital structure is dynamic, and there is movement around the optimal mix (62:324). Operation at a point other than the optimal mix may occur because of situations internal or external to the firm. As illustrated in Figure 4, there are many times when the cost of debt is less than the cost of equity. For this and other reasons, many firms find debt financing more attractive than equity financing.

There are some advantages to using debt as opposed to equity financing. Thomas Pogue points out the tax advantage of debt financing (40:185). The interest charges

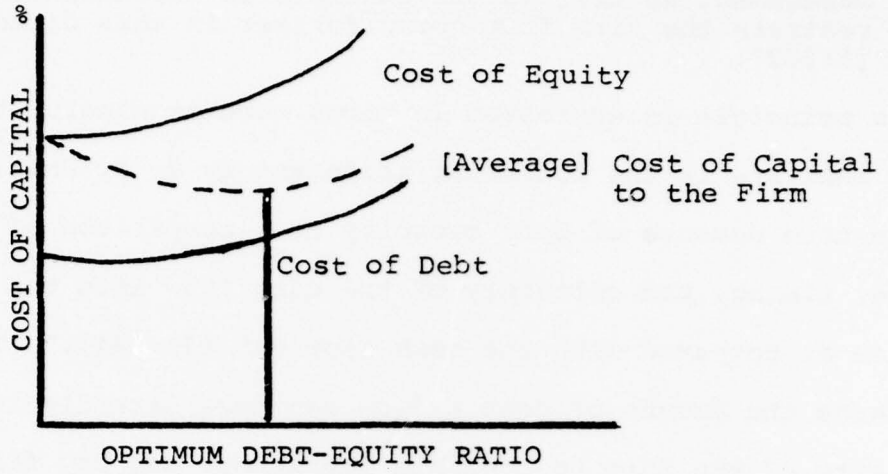


Figure 4

Cost of Capital and Optimum
Debt/Equity Ratio (43:126)

associated with debt financing are tax deductible. Weston points out that the use of debt creates financial leverage that can magnify the return on the owner's investment (equity) whenever the return on assets is greater than the cost of debt[8] (62:266). Modigliani and Miller go so far as to suggest that all projects should be financed entirely by debt, then once the project reflects itself in earnings, use an equity issue to retire the debt at a lower price (30:392). The question is how much debt can the firm assume. Baumol and Malkiel state:

> . . . there are limits of prudence to company borrowing; when borrowing reaches a point where insolvency becomes a real possibility, the self interest of

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[8]The converse is also true, when the return on assets is less than the cost of debt, the losses are magnified (62:266).

> management as well as the interest of stockholders may restrain the firm from going further in this direction [5:562].

This principle is expressed in terms more meaningful to the DOD analysts in the following statement by J. N. Philips, "The true measure of debt capacity is a comparison of the size, timing, and certainty of the cash flow into the enterprise as compared with the cash flow out [39:844]." This relates the amount of debt a firm can have directly to the ability of the firm to continue operations and pay fixed interest charges required from a dedt financing. The use of extensive debt financing is reflected in the aerospace industry.

Fox has observed that during the period 1964-1970, the debt/equity ratios of the aerospace industry have increased from 0.25 to 0.57, or an increase of 128 percent (12:57). Standard and Poor's states that in 1975, the aerospace industry's percent of current debt to net worth was 132.9 percent (47:A-27). It is Fox's contention that the increasing use of debt in the aerospace industry has two side effects, ". . . financial stress and a loss of flexibility in management decisions [12:60]." It is of interest to compare Fox's conclusion with the view of bankers when considering a loan to finance capital expenditures. The following excerpt shows the two factors bankers considered most important in evaluating a loan application for capital expenditures:

1. The organization's management, both in terms of qualifications and the structural balance of the team of managers, represents a cornerstone in the banker's analysis.

2. The corporation's financial position, including the information system necessary in properly examining the firm's financial status, is also of key importance. In this context, the respondents exhibited an interest in (1) the time span necessary in developing profits/or positive cash flows; (2) the business maintaining an adequate liquidity position; and (3) the providing of financial statements based upon a sound accounting system [14:64].

Both authors are concerned with management, and Fox's financial stress relates directly to the banker's interest in positive cash flows and liquidity. The researchers believe that the DOD analyst should be no less thorough in his examination than the banker.

The DOD analyst should at least check the trends in the firm's capital structure for the last five years. An examination of Lockheed would have shown a large increase in long-term debt and total debt to capitalization from 1966 to 1972 (Table 6). Any increase in debt will be accompanied by an increase in cash outflows to retire that debt and the periodic interest charges. The problem of adequate cash flow is not unique to the aerospace industry, but some of the steps taken to overcome cash flow problems are. This situation is reflected in the capital investment decision.

Capital Investment Decision

Although a firm may have decided a project is worthwhile and that funds are available, it still must

TABLE 6

LOCKHEED DEBT STRUCTURE (Millions of Dollars and Percentages) (22:44,47)

Year	1966	1967	1968	1969	1970	1971	1972
Long-Term Debt ($)	17	140	138	336	584	708	761
Total Debt to Capitalization (%)	5.1	28.6	27.1	51.2	71.3	73.9	74.1

decide how much it will invest in the project. Manufacturing firms normally expect new equipment to be productive over a long period of time. However, members of the aerospace industry may be faced with the cost of an expensive piece of equipment that is appropriate for a single DOD contract. DOD has recognized this situation and may provide the required piece of equipment. Belden has observed:

> Materials, plants and equipment, and working capital are often required by defense contractors to accomplish maximum production of a military item in accordance with a specific production schedule. The administrative contracting officer provides assistance to defense contractors in such situations, or he notifies the procuring contracting officer of the requirement [6:152].

Although private financing is the preferred method of financing on defense contracts, the above situation is not unusual. ASPR states that the requirement for guaranteed loans, or progress payments shall not be treated as a handicap in awarding contracts (52:E:7). Obviously

loans and/or payments can alleviate some of the working capital problems, but they also discourage private capital investment. According to Standard and Poor's, the Pentagon has stated that aircraft makers (with the exception of Northrop) are considered light investors in capital facilities, while missile makers and shipbuilders invest more heavily in facilities (47:A-28). Even though the aircraft manufacturers have invested little of their own funds with respect to DOD contracts, the amount of long-term debt of particular firms (i.e., Lockheed) and the aerospace industry in general has been increasing. This situation again emphasizes the need for the DOD analyst to monitor the capital structure of prospective contractors. As previously mentioned, capital structure is dynamic. Recent DOD policy changes may promote a shift in capital structure.

"Profit 76 Study." This study was begun on the instructions of Deputy Secretary of Defense Clements on 13 May 1975. The study was directed by the Office of Assistant Secretary of Defense (Installation and Logistics) to explore ways to reduce the cost of DOD procurements (42:1). Specifically, DOD states:

> The reasons for contractor reluctance to invest in modern machinery and equipment for use on DOD contracts are many and varied, but it is clear that some are rooted in present procurement policy which fails to recognize adequately, (either in profit or as an allowable cost) the facility investment which may be required for efficient operation [53:i].

The goal of the study as stated by Secretary Clements was ". . . to develop policy revisions needed to motivate defense contractors to make investments which will reduce Defense Department acquisition costs [54:2]."

"Profit 76" resulted in two changes in profit policy. The first is that the imputed cost of capital for facility investment will be an allowable cost on most negotiated contracts. The second is that the level of facility investment will be recognized by contracting officers on reaching a pre-negotiation profit objective (53:i). For the purpose of this research, the first change is the more important of the two.

The cost of capital has previously been defined. It was pointed out that each source of capital, whether preferred stock or retained earnings has a unique cost. However, the cost of capital as used in the "Profit 76" study does not differentiate between equity or debt funds, but applies a uniform cost to both (53:30).

The significance of making the imputed cost of capital for facility investment an allowable cost is the potential for change in the firm's capital structure. Standard and Poor's describes this situation as follows: ". . . the Government allows contractors to charge off the interest expense of money borrowed for capital facilities, . . . [and] the imputed cost of money . . . from the firm's own retained earnings . . . [47:A-27]." If the relatively

high debt/equity ratio of the aerospace industry is kept in mind, a potential problem exists for DOD. Thomas Pogue has said that the greater the firm's debt to equity ratio, the greater the risk the firm will be unable to meet interest payments, and that lenders may react by increasing interest rates and the imputed cost of debt (40:184-185). The implication is that those aerospace firms that attempt to increase capital investment through debt financing may face higher cost of capital because of their capital structure. Even if DOD based the allowable cost on the average cost of capital for the industry, the overall capital structure of aerospace may make a higher than normal cost of capital standard for the industry. The worst scenario is of course the highly leveraged firm that can only obtain capital if the government guarantees the loan. The firm then requires some form of advance payments to meet the cash flow requirements of the project and the increased debt. Finally, through poor management or whatever, the firm defaults on the loan. Although the possibility of this situation seems remote, it cannot be ignored by the analyst.

The above discussion is not intended as a criticism of the policy changes stimulated by "Profit 76." Rather, the discussion is intended to point out the need for added vigilance by DOD analysts. Standard and Poor's has quoted the Pentagon as saying that shipbuilders and missile makers should have their profits increase a couple of percentage

points while aircraft makers may experience a dip in profits (47:A-28). However, a one percent change on a multimillion dollar contract is significant. If the new profit policy has the desired effect and promotes more capital investment, the analyst must investigate all possible effects on contract completion. It would be necessary to go to the contractor and determine his source for the funds whether debt or equity. If he intends to use debt, how will he retire the debt? These are the types of questions that must be answered, and the best source of information will be the managers of the firm.

Corporate Dividend Policy

The impact of dividend policy on the firm's financial capability is difficult to specify. This difficulty is due to conflicting opinions in the literature.

Dividends are the distribution to the shareholders of all or some portion of retained earnings (60:321). Dividend policy then is the determination of how much of retained earnings should be returned to stockholders, what form the dividend will take (cash, stock, etc.), and how much should be kept by the firm for capital investment. The controversy around dividend policy is how it affects the "value of the firm."[9] Modigliani and Miller

[9]Although a number of definitions exist for the "value of the firm" (i.e., book value, intrinsic value, etc.), the researchers are equating value of the firm to

contend that dividends only contain information about expected future earnings of the firm, and that investors do not care whether they receive dividends or capital gains (30:280-285). Eugene Fama shows empirically that dividend decisions and investment decisions are independent, and that neither should be based upon the other (10:304). The opposite point of view is illustrated by Baumol and Malkiel. They relax some of the assumptions of Modigliani and Miller (Baumol and Malkiel allow transaction cost, taxes, and different lending and borrowing rates). Their conclusion then is that the financial structure of the firm is not irrelevant to the stockholder (5:554). A similar though more intuitive approach is taken by Stiglitz. Stiglitz concludes that if individuals believe financial policy affects the value of the firm, then bias is introduced and policy will affect the value of the firm (49:863).

The differing opinions in this area make it difficult to find a basis for financial analysis. It is the opinion of the researchers that any investigation of dividend policy should be preceded by an indication that dividend policy will change. If that is the case, then the major area to analyze would be retained earnings, and how

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market value, where market value of the firm is the price per share of common stock. It is the opinion of the researchers that market value is a more realistic definition than the others for this discussion.

changes in dividends effect the value of the firm as reflected in the price of equity issues. Again the problem is which theory (Miller and Modigliani or Stiglitz) the analyst should subscribe to. The researchers feel there is insufficient evidence to choose one theory over the other; the authors would advocate that each firm's equity owners should be treated as a unique set. Then the historical relationship between dividend changes and the price of common stock can be analyzed. The situation may be as Miller and Modigliani suggest, that changes in dividends only affect the mix of stockholders, but not the value of the firm (30:270-272). However, the change of owners may produce small fluctuations in the cost of equity issues. These fluctuations in turn may impact the immediate ability of the firm to raise equity capital. It is the impact on the ability to raise equity capital of which the financial analyst must be aware of.

Summary

Corporate financial policy is the cornerstone of the firm's financial capability. It is the ability of financial policy to influence daily operations that makes it important to the financial analyst. Policy is shaped by four major decisions: (1) Capital Budgeting, (2) Capital Structure, (3) Capital Investment, and (4) Dividend Policy decisions. It is important for the financial analyst to

understand what guides these decisions and their importance to the firm's financial capability.

The capital budgeting decision determines which projects the firm will undertake. The basic decision-making tool is economic analysis. Economic analysis is used to rank projects. Then the ranking is examined to see how well it matches corporate objectives. The financial analyst must be wary of the situation in which corporate objectives disturb the economic order of project selection.

Capital structure is the mix of capital (debt and equity) the firm maintains. The analyst is interested in the ratio of debt to equity and how it affects the firm's ability to obtain capital. The aerospace industry has a relatively high debt to equity ratio and this affects their cost of capital. It is important to keep in mind that no matter what the source of capital, debt or equity, there is a cost associated with each.

The third decision is the capital investment decision. The firm must decide how much capital they are willing to invest in the project(s). The "Profit 76 Study" may have an impact in this area. By linking a portion of the firm's profit to their capital investment, capital expenditures are encouraged. Because of the highly levered position of the aerospace industry, the analyst must carefully examine the ability of a particular firm to increase its capital investment.

The final area of discussion was dividend policy. This area is difficult to specify for the analyst because of conflicting theories in the literature. The researchers suggest that the area only be analyzed if a change in dividend policy is suggested by management. If analysis is necessary, then each firm should be treated uniquely. Historical trends can then be analyzed to determine if there is any relationship between dividend policy and the cost of equity issues for this firm. The major concern for the analyst is whether any fluctuations are present in the price of equity issues, and how these fluctuations may affect the firm's ability to raise equity capital.

The common thread throughout this section is the firm's ability to raise capital and use it effectively. Analysis in this area depends on knowledge of techniques used and how the firm's financial objectives are to be met. This is the task of the financial analyst in evaluating corporate financial policy.

Prior Performance on Government Contracts

The Department of Defense has specified that a contractor's past performance must be considered in each source selection (36:20). Past performance, as used by DOD, focuses upon how well the contractor met the schedule, technical, and cost goals on past contracts (55:6). Although poor financial planning and performance may impact

all of these areas (technical, schedule, and cost), this research focuses upon the cost goal.

The obvious measure of how well a contractor met cost goals is the amount of cost underruns or overruns. However, to stop at this point would be an oversimplification. An examination of cost over/underruns would probably indicate several reasons for the over/underruns. Some of the reasons may be inflation, engineering changes, cost accounting methods, financial management, and others. The job of the financial analyst is to separate financial management from the other factors that influence cost.

The separation of financial management as a factor of cost performance would be relatively easy if data existed on past contracts in a usable form. However, that is not the case. In 1968, LMI pointed out the inadequacy of the data on past performance in the Defense Documentation Center (DDC) data bank (27:13). Since the LMI study, the DDC data bank has been discontinued, but not replaced with another data source. The problem is compounded for the analyst by a lack of DOD emphasis on past performance. Fox states "Commercial procurement decisions are more frequently influenced by the reputation and past performance of a contractor than are defense procurement decisions [12:202]." Along with this, another result of "Profit 76" was that prior performance was dropped as a weighted determinant of contractor profit (54:28).

Even with these problem areas, the researchers believe it is of value to investigate past performance. The process of gathering the data will be tedious and time consuming. The isolation of financial management as a separate factor will also be difficult. It is the opinion of the authors that more research should be done on this particular area. One area of particular interest should be the establishment of an automatic data processing system to collect cost information as it is generated. Improvement in this area will not only help the financial analyst, but will make prior performance a more viable factor in source selection.

CHAPTER IV

FINANCIAL ANALYSIS CHECKLIST

Overview

This chapter documents the second stage of research, and answers Research Question 2: How can this information be combined to form an approach to financial analysis that is applicable to the aerospace industry? The reader should note that the information referenced in the research question are those specific sources of financial information, tools and techniques of financial analysis, techniques of financial forecasting, financial policies of the corporation, and prior performance on Government contracts that were developed in Chapter III of this thesis. Research Question 2 was answered by means of structuring the above information into a checklist-type format.

The purpose of using the checklist-type format is threefold. First, the format ensures that the DOD analyst reviews and analyzes all pertinent financial information about the aerospace corporation in question. Second, the format ensures that the DOD analyst performs a consistent and adequate financial analysis on all prospective aerospace contractors. Finally, by performing all items listed on the checklist, the DOD analyst will be able to state,

with a reasonable degree of accuracy, the financial position and capability of the aerospace corporation.

In developing the checklist, the researchers condensed all information presented in the five major categories discussed in Chapter III. Those major categories are: (1) Sources of financial information, (2) Tools and techniques of financial analysis, (3) Techniques of financial forecasting, (4) Corporate financial policies, and (5) Prior performance on Government contracts. These categories will be used to form the basis of the financial analysis checklist.

In following the basic checklist format, the researchers selected those aspects in each major category that are appropriate for performing a financial analysis of an aerospace contractor. The selection of those specific inputs and techniques for inclusion into the checklist was based upon the findings of a comprehensive literature review. However, in order to prevent the reader from being bombarded with every known financial analysis technique and to keep the checklist within manageable limits and length, the researchers selected those specific elements that would allow the analyst to perform a thorough analysis in a minimum amount of time.

Uses of the Checklist

The researchers foresee two major areas of use for the approach developed. The first use is as a decision-making tool for determining the financial capability of a prospective aerospace contractor. Used in this manner, the approach would be applied to a contractor prior to contract award. The researchers also believe that there is a legitimate use for the checklist as a management tool after the contract has been awarded. There are several reasons for using the checklist in this manner. First, financial troubles may develop after the contract has been awarded. If the checklist has been continually updated, it may give an early warning of impending trouble. Second, a contractor may be involved in several DOD projects while competing for others. In this situation, the checklist can serve as a management tool as changes in the number of contracts awarded are reflected in the financial data in the checklist. Finally, in those cases when contract award is made in spite of the contractor's poor financial position, the checklist can be used to highlight those areas where advanced planning may alleviate future problems.

Financial Analysis Checklist

I. Sources of Financial Information

In preparation for performing the analysis, the analyst should obtain, at the minimum, the following financial information on the firm in question:

A. Aerospace Corporation Reports

1. The most current 10-K report
2. All quarterly reports for current year
3. Forecasted sales and cash flow reports
4. Pro forma balance sheet and income statement

B. Investment Advisory Service Reports

1. Value Line's individual stock report
2. Standard & Poor's individual stock report
3. Moody's "Bond Ratings" Report

C. Aerospace Industry Averages Reports

1. Standard and Poor's Basic Analysis
2. Dun & Bradstreet's "Key Business Ratios"
3. "Aerospace Facts and Figures" annual book

II. Tools and Techniques for Financial Analysis

The analyst should, as a minimum, perform the following computations and analyses (in many cases, these computations are already done in Value Line and Standard and Poor's).

A. Ratio Analysis--compute the following ratios:

1. Liquidity Ratios

a. Current ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}}$

b. Quick ratio = $\frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}}$

c. Working Capital = Current Assets - Current Liabilities

2. Leverage Ratios

   a. $\text{Debt ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$

   b. $\text{Current Debt to Net Worth} = \frac{\text{Current Liabilities}}{\text{Tangible Net Worth}}$

   c. $\text{Total Debt to Net Worth} = \frac{\text{Total Debt}}{\text{Tangible Net Worth}}$

3. Efficiency Ratios

   a. $\text{Inventory Turnover} = \frac{\text{Net Sales}}{\text{Inventory}}$

   b. $\text{Receivables Turnover} = \frac{\text{Net Sales}}{\text{Receivables}}$

   c. $\text{Working Capital Turnover} = \frac{\text{Net Sales}}{\text{Working Capital}}$

4. Profitability Ratios

   a. $\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}}$

   b. $\text{ROI} = \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Assets}}$

   c. $\text{ROE} = \frac{\text{Net Profit}}{\text{Tangible Net Worth}}$

B. Trend Analysis

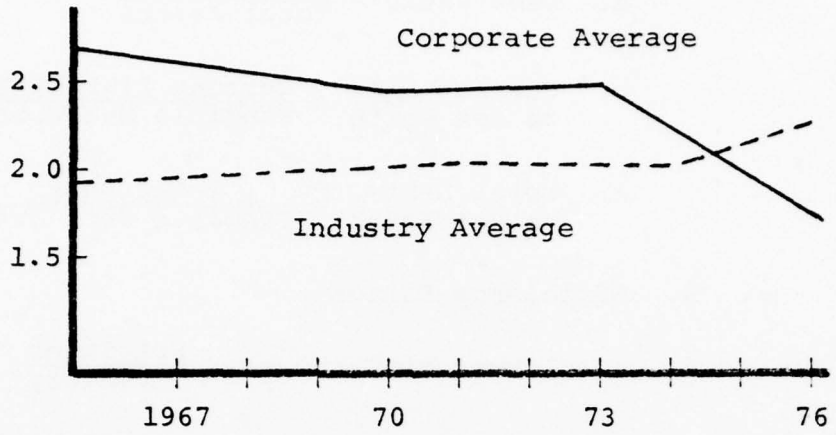
1. Plot each corporate ratio and each aerospace industry average ratio for past ten years.

2. Analyze the corporate trend in relation to the aerospace industry average trend.

3. Look for significant changes within the corporate average.

4. Also look for significant differences in corporate trends when compared with the industry.

5. An example: Current Ratio Trend Analysis



C. Cash Flow Analysis

1. Analyze the corporation's current balance sheet and income statement for operating cash inflows and outflows.

2. Determine the net operating cash flow (positive or negative).

3. Determine the trend of net operating cash flow for past five years.

4. A minimum cash flow to fixed charges of 1 to 1 is desired.

D. Funds Flow Analysis

1. Obtain the corporation's statement of changes in financial position.

2. Analyze the changes in all the asset and liability accounts.

3. Determine what caused the change in the firm's working capital position.

4. Determine the amount of capital derived from sale of equity and/or long-term debt and what use was made of these funds.

III. Financial Forecasting Tools

Projecting the future financial position of the corporation is important in that it can reduce financial surprises, anticipate upcoming corporate financial needs, and assess the firm's future financial capability. As a minimum, the analyst should analyze the following three types of forecasts:

A. Sales Forecast

1. Obtain a sales forecast from the corporation.

2. Verify for validity by comparing firm's forecast with independent investment advisory services' forecasts. Use Value Line's sales forecast for comparison.

B. Cash Flow Forecast

1. Obtain a cash flow forecast from the corporation.

2. Analyze the expected cash inflows with the expected cash outflows to determine the expected net operating cash flow.

3. Determine the amount of the firm's financial requirements to perform the contract.

4. Determine if the firm has the capability to generate any external financing to meet an expected negative cash flow.

5. Perform a cash flow forecast analysis for the expected life of the contract.

C. Pro Forma Financial Statements

1. Obtain a projected income statement and projected balance sheet from the corporation.

2. Verify for validity by comparing the firm's projections with independent investment advisory services' forecasts. Use Value Line's key projections for comparison.

3. Perform a ratio analysis for these statements.

4. Perform a trend analysis for these ratios by plotting them on the graphs constructed in Section II-B of this checklist.

5. Analyze the projected results to determine the future financial strength of the corporation.

IV. Corporate Financial Policy

The analyst should be aware of the corporation's financial policies. In particular, the analyst should obtain the corporation's policies on:

A. Capital Budgeting

1. What method is used to rank projects (i.e., IRR, NPV, etc.)?

2. What is the effect on DOD contracts if the economic ranking is reordered by corporate objectives?

B. Capital Structure

1. Reference the leverage ratios (II.A.2) and use trend analysis to get a picture of the firm's capital structure.

2. Ascertain the firm's plans to maintain or adjust capital structure during the life of the contract.

C. Capital Investment

1. The analyst should find out the source of capital for new investment, and determine if that particular source coincides with stated plans for capital structure.

2. Monitor the cost of each source of capital for the firm, and compare it to other firms in the industry.

D. Dividend Policy--if management plans a change in policy

1. Analyze the impact of past changes in dividend policy.

2. Monitor the effect on retained earnings, and the firm's ability to raise equity capital through the sale of common stock.

V. Past Performance on Government Contracts

The analyst should evaluate the corporation's past financial performance on government contracts.

A. Analyze all past cost over-/underruns.

B. Determine reasons for these cost over-/underruns.

C. Attempt to identify those portions of cost over-/underruns that corporate management had direct control over. For example, management cannot control inflation, Government induced engineering changes, etc.

D. Attempt to evaluate management's ability to operate on a financially effective basis.

NOTES

1. Ensure that all financial information obtained has been verified for reliability.

2. This analysis checklist is an aid in making a judgment decision, but it is not a substitute for judgment.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this research was to develop an approach to financial analysis to be followed during source selection. Several factors have been cited to point out the need for such a procedure. Among those factors were the number of different agencies that may perform financial analysis. For example, the analysis may be performed by the SPO, DCASO, or AFPRO. The number of agencies may cause repetition, or they may use different procedures and assumptions that make the output of one organization unusable by another. Another factor cited was the size of the defense budget. It was shown that the purchasing power of the defense budget is decreasing. The drop in purchasing power increases the importance of proper management of funds, not only by DOD, but also by prospective DOD contractors. The DOD cannot afford to award a contract to a contractor that is not financially capable. The objectives of the acquisition process were also mentioned as important reasons for financial analysis. DOD is not only interested in purchasing the best weapon system at a fair price, but it is also interested in maintaining the industrial base

and securing as many socioeconomic benefits as possible from DOD procurements. These benefits will not accrue if the contractor is not financially viable.

For the purpose of this research, the aerospace industry was chosen as the basis for the financial analysis model developed. It was shown that the aerospace industry is not as financially strong as may be desired. Problems within the industry are many. Although military sales are on the upswing, commercial sales, which are the greater profit maker, are lagging. Development of the "jumbo jets" was expensive, and actual sales have not met forecast sales. Changes in the DISC tax laws were mentioned for their effect on corporate income. The net effect of the problems mentioned was that many aerospace firms are facing greater financial problems.

It was emphasized that DOD guidance on performing financial analysis is not specific. Most of the guidance provided is contained in ASPR. Section 1 of ASPR requires that determination of contractor financial capability be one of the milestones of advanced procurement planning. Appendix E gives some specifics on what information is to be collected (i.e., financial statements of the contractor). Additional general instruction is provided in OMB Circular A-109 which directs that financial capability be a factor in contractor selection. The importance of financial analysis is further emphasized by DOD retention of LMI to

study contractor financial capability (Project 75-11). This project was initiated in the fall of 1975, and as of May, 1977, results of the study were not known.

This research was guided by two research questions. (1) What specific information and financial techniques will be most useful to evaluate the financial capability of an aerospace contractor?, and (2) how can this information be combined to form an approach to financial analysis applicable to aerospace corporations? The method of research was to review applicable literature on the tools and techniques of financial analysis. In some instances this information was available on a particular industry (railroads, utilities, etc.), but this was not the case for the aerospace industry. Consequently, judgment was exercised by the researchers as to the inclusion and exclusion of a particular technique. However, because a particular technique did not appear was not to denigrate that method, but rather to say that, in general, the method was not needed. The analyst was cautioned that he should use whatever is necessary in a specific situation.

Five specific areas were reviewed to answer the first research question. The five areas were: (1) sources of financial information, (2) tools and techniques of financial analysis, (3) financial forecasting techniques, (4) corporate financial policy, and (5) prior performance on government contracts.

Sources of financial information were subdivided into: (1) corporate financial statements, (2) investment advisory service reports, (3) creditor reports, and (4) business and aerospace publications. Each source of information was discussed in detail with particular attention paid to the corporate annual reports. Each of the four statements which make up the corporate annual report (balance sheet, income statement, statement of retained earnings, and statement of changes in financial position) received an extensive treatment. The analyst was cautioned to cross-check the corporate reports with external sources of information. It was emphasized that many external sources are provided free through public libraries; however, individualized reports can be purchased from such services as Compustat.

The second area to be investigated dealt with the tools of financial analysis. Among the tools discussed were ratio analysis, trend analysis, cash flow analysis, and fund flow analysis. Ratio Analysis covered four groups of financial ratios (liquidity, leverage, efficiency and profitability ratios). The researchers indicated three ratios in each group that are important to the financial analyst. Trend analysis introduced the importance of time to the analysis of financial ratios. By plotting a financial ratio with respect to time, the analyst has a visual display of how the ratio has changed. It was also

emphasized that a financial ratio should be compared to the industry average. These averages are provided along with the twelve ratios identified.

Flow analysis was introduced with an examination of the movement of cash in and out of the organization. Cash flow was examined with respect to the firm's ability to meet fixed charges. Funds flow analysis covered a broader area than cash flow analysis. Whereas cash flow analysis examined only cash movement, in funds flow analysis the researchers examined the movement of all assets. The analyst was reminded that the importance of funds flow analysis was that it allows the analyst to examine the impact and quality of management decisions.

The third area investigated was financial forecasting. The techniques discussed prior to financial forecasting were concerned with past and current performance. However, it was emphasized that future performance is indeed critical in judging whether the firm can meet contract requirements. Financial forecasting techniques were broken into sales forecast, cash flow forecast, and pro forma financial statements.

The sales forecast was described as a key element in determining future performance. The firm normally plans to operate so as to meet anticipated sales. The deviation of actual sales from forecast sales will determine the adequacy or inadequacy of cash flows. Cash flow forecasts

accompany the sales forecast. Cash flow forecasts were described as the predictor of the quantity and timing of future cash movement. It was emphasized to the analyst that deficiencies in one or both of these forecasts can cause the firm to over- or under-estimate its financial obligations.

The pro forma financial statements were basically projections of the firm's current financial statement given a proposed set of transactions. Although all the financial statements are projected forward, it was emphasized that the balance sheet and the income statement are the most important to the analyst. Since these statements are prepared by the firm, a potential problem was pointed out to the analyst in validating the information. The Value Line Investment Survey was mentioned as a source of information to help validate the firm's pro forma statements.

The fourth major area reviewed for inputs to the model was corporate financial policy. Corporate financial policy was subdivided into the following categories: (1) capital budgeting, (2) capital structure, (3) capital investment, and (4) dividend policy. Capital budgeting is concerned with how the firm determines which projects will be accepted. Several methods were mentioned to make this determination such as the payback method, or the internal rate of return. The analyst was made aware of how these

techniques work, and the importance of reconciling an economic technique with the firm's objectives.

In the capital structure section, the analyst was made aware of the importance of the firm's debt to equity mixture. It was pointed out that many firms in the aerospace industry have relatively high debt to equity ratios and that this affects their ability to obtain further financing. Capital investment emphasized how much the firm was willing to invest. It was shown that many firms in the industry are light investors because of the unique capital expenditures required in some DOD contracts. The analyst was appraised of the "Profit 76" study which hopes to promote more capital spending by making the imputed cost of capital a factor in determining the contractor's profit. The analyst was cautioned to examine a contractor's increases in capital spending for the effect on cash flow.

The final area discussed as part of corporate policy was dividend policy. Dividend policy is the determination of how much of retained earnings will be returned to stockholders, and what form the dividend will take. The researchers recommended that dividend policy only be analyzed if a change in the policy is anticipated. If dividend policy is analyzed, then the emphasis should be placed on how any change in the mix of stockholders will affect the firm's ability to raise equity capital.

Prior performance was the final area discussed for inclusion in the model. The emphasis in this section was to break down financial past performance (defined as cost over/underruns) and isolate the effect of financial management from inflation and other factors. It was stressed that this task will be a tedious one because of anticipated problems with data collection and collation.

The second research question is answered in Chapter IV of the thesis. The researchers' objective was to combine the information in Chapter III into a checklist-type model. This checklist is intended to be one the analyst can follow much as a pilot follows a flight checklist in an aircraft. Again, it is emphasized that any particular technique not included in the checklist should be used if the analyst feels it is necessary.

Conclusions

The tools and techniques of financial analysis identified in Chapter III were selected to meet the needs of the aerospace industry financial analyst. In Chapter IV, these elements were combined to form a checklist which can be followed when performing a financial analysis. The researchers believe that this checklist will benefit the DOD analyst as he examines a prospective contractor. The checklist presents an orderly approach to an analysis, and an approach that lends itself to making and justifying a decision as to the financial capability of a firm.

The researchers realize that financial capability of a firm is not the only factor in the award decision. There will be times when an award is made, regardless of the contractor's financial capability. Even in these situations, the financial analysis checklist can be of use. If the financial weaknesses of the contractor are highlighted, then advance planning by the Government can lessen the impact of these deficiencies.

Recommendations

The researchers believe that further study should be devoted to the computerized investor services currently in existence in the private sector. This area should be investigated to determine if the services provided are beneficial on a cost basis. If not, consideration should be given to DOD developing its own computerized financial analysis system.

The researchers also believe that further study should be directed towards determining the short- and long-term effects of the proposals in the Profit 76 study. Specifically, the proposal to incentivize the contractor to purchase new plants and equipment merits study. Such a proposal will have an impact on the capital structure of the aerospace firm and industry.

The final recommendation for further research is in the area of contractor past performance. It is the

opinion of the researchers that, intentionally or unintentionally, past performance has been deemphasized by DOD. The focus of this research should be on whether past performance has been deemphasized, if past performance is an important financial indicator, and how to make past performance more meaningful during source selection.

APPENDICES

APPENDIX A

FINANCIAL STATEMENTS

LOCKHEED AIRCRAFT CORPORATION

CONSOLIDATED BALANCE SHEET

(Dollars in millions)

	December 26, 1976	December 28, 1975
ASSETS		
CURRENT ASSETS		
Cash and equivalents (Note 3)	$ 140.8	$ 52.7
Restricted cash (Note 3)	36.7	5.6
Accounts receivable (Schedule XII and Note 4)	195.8	209.8
Inventories (including TriStar inventories of $166.0 in 1976 and $204.3 in 1975) (Notes 2, 5, and 8)	405.4	387.5
Future tax benefits (Note 6)		43.0
Deferred tax charges (Note 6)	15.1	18.7
Prepaid expenses	45.0	49.1
Total current assets	838.8	766.4
PROPERTY, PLANT, AND EQUIPMENT, at cost (Schedule V and Notes 1b and 8)		
Land	29.9	29.6
Buildings, structures, and leasehold improvements	289.5	288.4
Machinery and equipment	422.4	414.6
Net property, plant, and equipment	741.8	732.6
Less accumulated depreciation and amortization (Schedule VI)	494.5	476.6
	247.3	256.0
NONCURRENT ASSETS AND DEFERRED CHARGES		
Future tax benefit, long-term portion (Note 6)		9.1
TriStar initial planning and tooling and unrecovered production start-up costs (Note 2)	453.3	502.5
Other noncurrent assets (net of allowance of $4.2 for doubtful notes receivable) (Schedule XII and Note 8)	46.5	19.4
	$1,585.9	$1,573.4

	December 26, 1976	December 28, 1975
LIABILITIES AND SHAREHOLDERS' EQUITY		
CURRENT LIABILITIES		
Accounts payable	$ 195.7	$ 220.4
Salaries and wages	111.7	102.2
Income taxes (Note 6)	9.8	7.1
Other taxes	36.2	32.1
Customers' advances in excess of related costs	208.5	111.4
Retirement plan contribution (Note 7)	63.1	62.8
Other liabilities	116.8	115.0
Current portion of long-term debt (Note 8)	111.8	18.4
Total current liabilities	853.6	669.4
DEFERRED INCOME TAX – LONG TERM (Note 6)	4.4	15.7
LONG-TERM SENIOR DEBT (Note 8)	436.2	688.0
4-1/4% CONVERTIBLE SUBORDINATED DEBENTURES (Note 8)	125.0	125.0
COMMITMENTS AND CONTINGENCIES (Notes 2, 7, 11, 12, and 13)		
SHAREHOLDERS' EQUITY (Notes 2, 8, 9, and 13):		
$9.50 Series Preferred Stock, $1 par value	47.4	
Common Stock, $1 par value	11.4	11.4
Additional capital	88.1	82.5
Retained earnings (deficit)	19.8	(18.6)
Total shareholders' equity	166.7	75.3
	$1,585.9	$1,573.4

(Source: 24)

LOCKHEED AIRCRAFT CORPORATION

CONSOLIDATED STATEMENT OF EARNINGS

(Dollars in millions except per-share data)

	Year Ended	
	December 26, 1976	December 28, 1975
Sales	$3,202.7	$3,387.2
Costs and expenses	3,068.2	3,239.9
Program profit (a)	134.5	147.3
Interest and other income	13.2	10.4
	147.7	157.7
Interest expense ($15.2 million savings in 1976 and $13.4 million in 1975 as a result of reduction in interest rate, Note 8)	54.3	67.5
Earnings before income taxes	93.4	90.2
Provision for income taxes (Note 6)	54.7	44.9
Net earnings for the year (Notes 2 and 13)	38.7	45.3
Preferred stock – dividend requirement and provision for redemption value	(1.1)	
Net earnings applicable to Common Stock	$ 37.6	$ 45.3
Earnings per share of Common Stock (Note 10):		
Primary	$ 3.10	$ 3.86
Fully diluted	$ 2.80	$ 3.49

(a) TriStar and Other Program profit (loss):

	1976			1975		
	TriStar	Other	Total	TriStar	Other	Total
Sales	$ 431	$2,772	$3,203	$ 559	$2,828	$3,387
Costs and expenses	556	2,512	3,068	653	2,587	3,240
Program profit (loss)	$ (125)	$ 260	$ 135	$ (94)	$ 241	$ 147

See Note 2 for accounting for the TriStar program

(Source: 24)

LOCKHEED AIRCRAFT CORPORATION

CONSOLIDATED STATEMENT OF SHAREHOLDERS' EQUITY

(Dollars in millions)

	$9.50 Senior Preferred Stock	Common Stock	Additional Capital	Retained Earnings (Deficit)
At December 29, 1974		$11.4	$79.0	$(63.9)
Fair value of warrants issued			3.5	
Net earnings				45.3
At December 28, 1975		11.4	82.5	(18.6)
Issuance of $9.50 Senior Preferred Stock	$47.1			
Fair value of warrants issued			5.6	
Provision for preferred stock redemption value	.3			(.3)
Net earnings				38.7
At December 26, 1976 (Notes 2, 8, 9 and 13)	$47.4	$11.4	$88.1	$ 19.8

(Source: 24)

LOCKHEED AIRCRAFT CORPORATION

CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION

(Dollars in millions)

	Year Ended	
	December 26, 1976	December 28, 1975
SOURCE OF WORKING CAPITAL:		
Operations:		
Net earnings for the year	$ 38.7	$ 45.3
Add charges against earnings not involving working capital:		
Depreciation and amortization of plant and equipment	39.5	39.8
Amortization of TriStar initial planning and tooling and unrecovered production start-up costs	50.0	47.3
Other	(8.5)	8.0
	119.7	140.4
Issuance of preferred stock	47.1	
Fair value of warrants issued	5.6	3.5
Current portion of future tax benefit	9.1	55.5
	181.5	199.4
APPLICATION OF WORKING CAPITAL:		
Additions to property, plant, and equipment	33.0	39.4
Reduction of long-term debt	251.8	18.7
Other	8.5	5.8
	293.3	63.9
INCREASE (DECREASE) IN WORKING CAPITAL	$(111.8)	$ 135.5
CHANGE IN COMPONENTS OF WORKING CAPITAL:		
Increases (decreases) in current assets:		
Cash	$ 119.2	$ (63.9)
Accounts receivable	(14.0)	34.9
Inventories	17.9	44.8
Future tax benefits	(43.0)	3.3
Deferred tax charges and prepaid expenses	(7.7)	19.4
Total increase in current assets	72.4	38.5
Increases (decreases) in current liabilities:		
Accounts payable	(24.7)	(40.4)
Customers' advances in excess of related costs	97.1	(49.3)
Accrued expenses and other liabilities	18.4	(9.2)
Current portion of long-term debt	93.4	1.9
Total increase (decrease) in current liabilities	184.2	(97.0)
INCREASE (DECREASE) IN WORKING CAPITAL	$(111.8)	$ 135.5

(Source: 24)

APPENDIX B

AEROSPACE INDUSTRY REPORTS

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Manufacturing & Construction

Line of Business (and number of concerns reporting)	Current assets to current debt	Net profits on net sales	Net profits on tangible net worth	Net profits on net working capital	Net sales to tangible net worth	Net sales to net working capital	Collection period	Net sales to inventory	Fixed assets to tangible net worth	Current debt to tangible net worth	Total debt to tangible net worth	Inventory to net working capital	Current debt to inventory	Funded debts to net working capital
	Times	Per cent	Per cent	Per cent	Times	Times	Days	Times	Per cent	Per cent	Per cent	Per cent	Per cent	Per cent
2873-74-75-79 Agricultural Chemicals (26)	3.14 2.28 1.66	8.25 5.20 2.78	28.44 13.53 11.63	52.27 33.73 18.44	5.56 3.57 2.35	8.65 5.27 4.08	23 36 61	15.3 7.6 6.5	18.9 32.4 52.2	37.8 51.2 103.2	48.9 117.3 172.0	28.9 72.1 143.1	85.1 137.9 211.2	5.8 35.9 122.9
3724-28 Airplane Parts & Accessories (68)	3.59 2.23 1.77	6.39 4.50 1.43	17.92 11.75 5.43	25.68 16.49 6.20	4.27 2.50 1.79	5.72 3.94 2.67	41 52 65	7.3 4.8 3.2	25.2 46.9 71.4	32.6 59.5 102.2	60.8 116.8 202.2	51.0 95.2 126.2	65.4 92.8 121.7	26.4 54.5 74.0
2051-52 Bakery Products (54)	2.52 1.72 1.24	2.93 1.47 0.51	12.35 5.77 3.04	38.31 18.51 7.01	6.04 4.73 3.66	27.30 14.88 7.88	13 24 35	33.4 24.5 15.2	35.5 72.0 98.7	22.0 45.5 71.3	46.5 76.4 159.1	35.9 77.1 138.0	116.5 181.9 249.5	18.0 52.5 172.8
3312-13-15-16-17 Blast Furnaces, Steel Wks. & Rolling Mills (61)	2.53 2.03 1.74	7.20 6.13 4.27	21.42 16.81 13.93	52.20 35.35 22.93	3.83 2.63 2.30	7.58 5.95 4.42	31 39 48	9.5 7.1 4.0	52.8 78.6 94.5	33.6 47.4 70.2	59.0 75.3 104.5	72.8 85.0 114.3	75.0 98.6 159.5	37.1 62.3 87.3
2331 Blouses & Waists, Women's & Misses' (54)	2.44 1.74 1.32	2.58 1.52 0.54	19.65 12.43 4.09	27.10 14.89 6.75	12.01 7.62 5.14	14.29 10.37 5.87	30 38 60	19.8 10.9 6.2	4.0 9.8 24.8	64.3 85.5 185.4	79.1 153.6 250.9	51.8 96.2 139.6	114.2 154.5 272.1	3.2 33.0 66.2
2731-32 Books; Publishing & Printing (55)	3.59 2.33 2.06	7.36 4.02 2.91	16.64 13.18 6.11	22.53 15.48 9.09	3.32 2.08 1.70	4.52 2.89 2.03	46 62 77	6.2 3.6 2.9	11.3 33.2 54.3	26.5 46.0 79.5	46.7 96.0 135.5	57.6 73.4 100.5	47.4 85.7 146.9	7.4 24.9 52.7
2211 Broad Woven Fabrics, Cotton (56)	4.54 3.32 2.75	5.16 3.42 1.34	12.30 8.49 3.17	20.54 10.60 4.29	3.29 2.81 2.00	5.08 3.98 3.04	36 53 65	8.4 6.0 3.9	36.9 50.3 54.9	16.9 33.7 56.0	54.3 83.6 134.7	53.5 74.6 98.1	48.2 64.3 99.2	21.4 45.7 87.5
2032-33-34-35-37-38 Canned & Preserved Fruits & Vegals. (78)	2.83 1.78 1.38	5.34 3.16 1.53	22.53 14.65 7.72	35.61 21.11 11.15	6.09 4.43 3.32	12.07 8.53 4.92	15 24 36	7.7 5.0 3.7	41.4 58.7 89.4	43.0 77.3 165.8	84.3 117.5 249.4	78.5 120.3 225.7	85.3 87.9 122.3	22.6 44.4 90.7
2751 Commercial Printing except Lithographic (74)	3.40 2.23 1.58	4.59 2.79 1.32	14.60 9.65 4.14	27.93 15.79 9.62	5.08 3.32 2.04	9.40 5.40 4.03	36 44 60	** ** **	41.6 60.8 90.6	21.0 47.1 85.5	57.9 85.9 136.3	** ** **	** ** **	15.3 51.3 119.4
3661-62 Communication Equipment (78)	3.69 2.44 1.80	7.72 4.13 1.79	19.57 11.26 4.79	28.84 14.71 5.83	4.35 3.03 2.13	4.87 3.55 2.77	49 64 86	6.0 4.5 3.5	22.2 44.3 64.9	33.1 60.8 105.2	54.1 111.3 183.1	61.3 73.7 99.0	57.8 93.7 152.2	23.4 50.2 73.2
3271-72-73-74-75 Concrete, Gypsum & Plaster Products (85)	3.04 2.22 1.45	5.71 3.56 1.56	14.71 7.91 2.61	36.73 18.33 10.61	3.69 2.45 1.61	10.75 5.75 3.09	34 45 63	15.9 9.5 6.0	43.1 64.3 90.2	19.2 43.9 81.0	46.1 81.5 130.3	39.0 61.0 99.2	79.5 132.6 255.5	32.9 64.5 127.4
2045-66-67 Confectionery & Related Products (80)	3.01 2.35 1.93	4.07 2.33 0.38	11.30 8.03 1.23	23.13 13.33 2.15	5.42 3.35 2.73	11.49 6.40 4.99	17 25 42	9.9 7.5 5.1	35.6 52.9 67.5	24.4 38.6 67.2	35.8 60.3 131.4	65.6 109.4 146.8	52.5 75.3 124.8	13.6 23.9 54.3
3531-32-33-34-35-36-37 Const., Min. & Handling Mchy. & Equipt. (89)	3.06 2.13 1.51	6.04 3.73 1.65	15.71 12.56 8.20	23.53 15.42 9.57	4.86 3.45 2.23	5.81 4.14 2.71	43 61 79	6.5 3.8 2.8	24.1 45.9 65.3	40.5 57.6 100.8	87.4 114.2 185.9	75.8 95.0 123.0	54.0 80.2 117.5	33.2 49.8 74.0
2641-42-43-45-46-47-48-49 Convtd. Paper & Paperboard Prods. (73)	3.67 2.35 1.79	5.51 3.77 2.33	17.30 13.53 9.12	30.32 18.44 12.67	4.49 3.34 2.47	7.55 4.86 3.65	33 43 53	8.5 6.0 4.6	30.8 51.6 73.7	25.7 43.7 73.9	53.1 73.3 119.5	60.3 91.1 111.0	61.5 77.1 124.2	15.9 35.9 66.7
3421-23-25-29 Cutlery, Hand Tools & General Hardware (80)	3.57 2.59 1.90	5.55 3.79 2.37	17.09 11.84 7.10	21.76 15.58 9.95	3.93 2.76 2.08	5.39 4.09 3.15	37 45 56	5.9 4.3 3.2	27.5 37.8 61.6	25.3 45.8 73.4	48.9 73.5 134.9	74.0 94.2 120.6	47.5 70.7 89.0	14.3 31.7 59.7
2041-22-23-24-26 Dairy Products (103)	2.64 1.49 1.25	2.20 1.23 0.42	14.93 9.29 2.84	51.25 24.09 10.09	10.55 7.75 4.97	32.91 20.79 12.23	18 25 31	32.7 22.0 11.0	42.2 67.3 94.1	39.3 69.3 114.1	73.5 105.3 164.7	62.6 75.3 167.3	126.1 207.2 300.9	10.1 65.6 133.6
2339 Dresses: Women's, Misses' & Juniors' (99)	3.20 1.85 1.33	2.10 0.85 0.15	14.55 5.01 1.75	16.52 7.27 2.15	11.82 7.42 3.35	13.78 8.30 4.58	33 48 53	16.5 10.0 6.0	2.5 9.0 23.3	37.6 95.1 139.6	67.2 149.9 245.0	38.5 76.1 124.9	83.5 138.7 223.1	4.9 19.4 65.3

** Not computed. Printers carry only current supplies such as paper, ink, and binding materials rather than merchandise inventories for resale.

(Source: 9)

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Per Share Data--Adjusted to stock price index level. Average of stock price indexes, 1941-1943 equals 10.

	Sales	Oper. Profit	Profit Margin %	Depr.	Income Taxes	Earnings Per Share	Earnings % of Sales	Dividends Per Share	Dividends % of Earn.	Price 1941-43=10 High	Price 1941-43=10 Low	Price/Earn. Ratio High	Price/Earn. Ratio Low	Div. Yields % High	Div. Yields % Low	Book Value Per Share	Book Value % Return	Work-ing Capital	Capital Expend-itures
1946	13.09	d1.46	def	0.13	cr0.79	0.35	2.67	0.79	225.71	15.53	8.92	44.37	25.49	8.86	5.09	14.96	2.34	13.86	1.37
1947	23.81	d3.25	def	0.38	cr2.50	d1.45	def	0.31	def	9.57	6.69	def	def	4.63	3.24	15.80	def	13.18	1.97
1948	31.87	1.27	3.98	0.40	0.61	0.05	0.16	0.83	1660.00	11.16	7.86	223.20	157.20	10.56	7.44	14.03	0.36	11.55	0.67
1949	42.14	2.49	5.91	0.49	0.71	1.34	3.18	0.84	62.69	10.10	8.17	7.54	6.10	10.28	8.32	15.20	8.82	11.97	0.89
1950	49.17	4.49	9.13	0.62	1.86	2.16	4.39	0.97	44.91	15.24	9.87	7.06	4.57	9.83	6.36	16.66	12.97	13.59	0.85
1951	67.35	3.88	5.76	0.65	2.33	0.98	1.46	1.03	105.10	16.63	12.89	16.97	13.15	7.99	6.19	16.56	5.92	12.01	2.82
1952	127.19	8.58	6.75	0.99	4.72	2.78	2.19	1.03	37.05	17.13	13.73	6.16	4.94	7.50	6.01	18.47	15.05	12.91	2.32
1953	175.98	13.05	7.42	1.26	7.68	3.99	2.27	1.35	33.83	20.27	16.26	5.08	4.08	8.30	6.66	21.17	18.85	14.68	1.54
1954	171.02	13.98	8.17	1.38	6.45	6.22	3.64	2.16	34.73	47.26	20.24	7.60	3.25	10.67	4.57	24.19	25.71	17.49	1.86
1955	169.36	14.41	8.51	1.54	6.88	6.35	3.75	2.57	40.47	60.74	41.50	9.57	6.54	6.19	4.23	26.81	23.69	20.67	2.42
1956	191.05	14.76	7.73	1.75	6.91	6.36	3.33	2.70	42.45	74.28	54.38	11.69	8.55	4.97	3.63	31.41	20.25	23.81	4.99
1957	232.88	17.15	7.36	2.29	7.71	6.99	3.00	2.87	41.06	71.01	46.62	10.16	6.67	6.16	4.04	36.03	19.40	23.48	6.83
1958	216.30	13.96	6.45	2.86	5.60	5.27	2.44	2.66	50.47	63.12	50.85	11.98	9.65	5.23	4.21	38.54	13.67	29.83	4.59
1959	216.09	9.36	4.33	3.29	2.83	2.61	1.21	2.27	86.97	65.87	46.59	25.24	17.85	4.87	3.45	36.58	7.14	29.51	3.98
1960	221.53	4.09	1.85	3.58	cr0.20	d0.12	def	1.75	def	50.73	39.66	def	def	4.41	3.45	34.04	def	27.50	4.08
1961	204.01	7.30	3.58	3.46	2.98	0.24	1.19	1.63	679.17	61.87	49.90	257.79	207.92	3.27	2.63	30.64	0.78	21.76	4.38
1962	215.87	13.18	6.11	3.59	4.13	4.74	2.20	1.76	37.13	61.16	44.21	12.95	9.33	3.98	2.87	34.42	13.77	25.16	4.77
1963	212.25	13.01	6.13	3.76	4.13	4.71	2.22	1.85	39.28	53.37	44.94	11.37	9.54	4.12	3.45	38.00	12.39	28.92	6.53
1964	208.89	13.79	6.60	4.00	4.46	5.08	2.43	1.93	37.99	58.01	45.38	11.42	8.93	4.25	3.33	40.73	12.47	29.14	4.83
1965	202.45	15.54	7.68	3.74	5.58	6.35	3.14	2.28	35.91	102.21	57.71	16.10	9.09	3.95	2.23	42.36	14.99	26.70	5.53
1966	218.11	14.28	6.55	3.95	4.59	5.89	2.70	2.29	38.88	108.45	70.06	18.41	11.89	3.27	2.11	46.22	12.74	26.04	11.95
1967	251.25	15.42	6.14	5.16	4.20	5.60	2.23	2.34	41.79	125.92	86.50	22.33	15.45	2.71	1.87	50.25	11.14	28.87	10.99
1968	277.48	17.71	6.38	6.14	6.89	6.66	2.40	2.56	38.44	106.10	87.92	15.93	13.20	2.91	2.41	53.74	12.39	31.56	9.52
1969	260.16	16.87	6.48	6.89	3.12	3.98	1.53	2.54	63.82	96.01	51.60	24.12	12.96	4.92	2.65	51.85	7.68	36.20	9.23
1970	262.45	13.57	5.17	7.22	2.01	2.65	1.01	1.69	63.77	53.90	29.86	20.34	11.27	5.66	3.14	53.08	4.99	39.20	7.19
1971	240.47	12.41	5.16	6.92	1.56	2.64	1.10	1.55	58.71	58.06	41.77	21.99	15.82	3.71	2.67	54.86	4.81	42.29	5.62
1972	229.80	15.10	6.57	6.48	2.87	4.16	1.81	1.56	37.50	64.77	54.71	15.57	13.15	2.85	2.41	58.09	7.16	48.05	4.90
1973	271.98	18.88	6.94	6.09	4.56	7.14	2.63	1.68	23.53	58.04	34.34	8.13	4.81	4.89	2.89	62.86	11.36	47.04	6.46
1974	313.06	22.33	7.13	6.51	5.77	7.84	2.50	2.00	25.51	42.72	30.61	5.45	3.90	6.53	4.68	59.32	13.22	46.33	R11.85
1975	291.12	19.80	6.80	6.67	5.03	7.27	2.50	2.24	30.81	55.24	33.83	7.60	4.65	6.62	4.06	65.29	11.13	55.19	10.53

d-Deficit cr-Credit

Stock Price Indexes for this group extend back to 1928.

Stocks in these indexes at the present time are preceded by a star (*). The date on which the stock was included or excluded is shown in parentheses.

*Boeing Co. (10-3-34)
*General Dynamics (11-28-56)
*Grumman Corp. (5-3-67)
*Martin-Marietta (Formerly Martin Co.) (3-12-41)
*Mc Donnell Douglas Corp. (10-13-65)
*Rockwell Intl. (formerly North American Rockwell) (3-1-39)
*United Technologies Corp. (formerly United Aircraft) (10-3-34)

Aviation Corporation of Delaware (5-11-38 to 4-2-47)
Consolidated Vultee (7-16-30 to 4-28-54)
Curtiss-Wright (9-12-29 to 4-29-70)
Douglas Aircraft (7-16-30 to 4-26-67)
Lockheed Aircraft (7-30-47 to 12-10-75)
Republic Aviation (7-30-47 to 10-13-65)

(Source: 44)

BEST AVAILABLE COPY

MANUFACTURERS OF—AIRCRAFT PARTS-(EXCEPT ENGINES)

31 STATEMENTS
ENDED ON OR ABOUT JUNE 30, 1975
&
32 STATEMENTS
ENDED ON OR ABOUT DECEMBER 31, 1975

ASSET SIZE	UNDER $250M	$250M & LESS THAN $1MM	$1MM & LESS THAN $10MM	$10MM & LESS THAN $50MM	ALL SIZES
NUMBER OF STATEMENTS		16	30	12	63
ASSETS	%	%	%	%	%
Cash		9.3	6.7	3.2	4.4
Marketable Securities		.8	3.3	.8	1.5
Receivables Net		24.9	20.3	25.6	24.0
Inventory Net		22.7	41.6	40.8	40.5
All Other Current		3.0	.5	2.5	1.9
Total Current		60.8	72.4	72.8	72.3
Fixed Assets Net		32.5	22.2	24.7	24.2
All Other Non-Current		6.9	5.4	2.5	3.5
Total		100.0	100.0	100.0	100.0
LIABILITIES					
Due To Banks—Short Term		6.0	6.9	5.4	5.8
Due To Trade		11.3	14.7	11.6	12.5
Income Taxes		1.9	2.4	.8	1.3
Current Maturities LT Debt		3.2	2.1	4.8	4.0
All Other Current		9.8	11.8	10.8	11.0
Total Current Debt		32.2	37.9	33.3	34.7
Non-Current Debt, Unsub.		16.8	14.4	24.9	21.7
Total Unsubordinated Debt		48.8	52.3	58.2	56.3
Subordinated Debt		1.7	.5	3.1	2.3
Tangible Net Worth		49.5	47.2	38.8	41.4
Total		100.0	100.0	100.0	100.0
INCOME DATA					
Net Sales		100.0	100.0	100.0	100.0
Cost Of Sales		75.2	74.7	77.3	76.4
Gross Profit		24.8	25.3	22.7	23.6
All Other Expense Net		19.6	18.1	18.4	18.4
Profit Before Taxes		5.2	7.2	4.3	5.1
RATIOS					
Quick		1.6	1.4	1.1	1.5
		1.1	.7	.9	.9
		.9	.5	.7	.5
Current		3.3	2.8	2.9	2.7
		2.0	1.9	2.4	1.9
		1.5	1.4	2.1	1.4
Fixed/Worth		.3	.3	.4	.4
		.8	.5	.5	.5
		.8	.7	.7	1.3
Debt/Worth		.4	.5	.7	.7
		1.0	1.2	1.8	1.3
		1.7	3.2	2.4	2.7
Unsub. Debt/Capital Funds		.4	.5	.7	.7
		.9	1.2	1.5	1.3
		1.6	2.5	2.0	2.2
Sales/Receivables	30 12.0	32 11.2	36 10.0	31 11.5	
	40 9.0	38 10.0	50 7.2	38 9.5	
	47 7.7	52 6.9	60 6.0	53 6.8	
Cost Sales/Inventory	25 14.3	60 4.5	84 4.3	40 7.3	
	43 8.3	120 3.0	120 3.0	100 3.6	
	69 5.2	150 2.4	150 2.4	150 2.4	
Sales/Working Capital		16.2	8.3	4.9	10.2
		9.5	5.1	3.8	5.2
		6.1	3.8	2.7	3.6
Sales/Worth		7.7	7.6	7.0	7.6
		5.8	4.4	4.4	4.4
		3.5	2.9	3.0	2.8
% Profit Bef. Taxes/Worth		38.7	44.0	30.3	36.5
		26.0	19.4	22.9	22.9
		17.6	6.6	17.1	11.3
% Profit Bef. Taxes/Tot. Assets		19.0	20.2	14.3	16.4
		13.0	9.7	10.4	11.1
		9.8	3.9	7.6	3.9
Net Sales ($)		28001M	181200M	419939M	636104M
Total Assets ($)		9852M	112993M	250574M	380032M

M = $ thousand
MM = $ million

(Source: 4)

AIRCRAFT PARTS, AND GUIDED MISSILE AND SPACE VEHICLE SUB ASSEMBLIES (SIC 3722, 3723, 3729)

Sales Volume Record of Total Industry

YEAR	DOLLAR SALES	INDEX
1948	(b)	—
1953	(b)	—
1958	4,110,947,000	100.0
1963	4,676,355,000	113.8
1964	5,095,555,000	124.0

Ratios or Percentages as indicated below (1964)	By Size of Assets *(in thousands of $)* A Under 500	B 500 to 2,499	C 2,500 to 9,999	D 10,000 to 49,999	E 50,000 and over	FOR THE TOTAL INDUSTRY
Selected Operating Factors *(in per cent of Net Sales)*						
1. Cost of Sales	69.1	71.4	72.1	81.9	80.1	79.6
2. Executive Salaries	7.7	2.9	2.2	.8	.2	.7
3. Rent	1.5	1.4	1.0	1.2	1.0	1.0
4. Repairs	.2	.6	.8	1.1	1.7	1.4
5. Bad Debts	.1	1.0	.1	.1	(a)	.1
6. Interest	.8	1.1	.8	.7	.4	.5
7. Taxes (Excl Fed Inc Tax)	2.6	2.5	2.7	2.4	2.4	2.4
8. Contributions	(a)	.1	.1	(a)	.1	.1
9. Depr/Depl/Amortiz*	3.1	2.6	2.5	1.7	2.5	2.4
10. Advertising	.8	.2	.6	.3	.2	.3
11. Pensions & Benefits	.3	.7	1.2	1.8	2.3	2.0
12. Net Profit after Inc Tax	3.2	3.3	2.5	1.6	2.7	2.6
Selected Financial Ratios *(number of times ratio is to 1)*						
13. Current Ratio	1.6	1.6	2.2	2.5	2.6	2.4
14. Quick Ratio	1.1	.8	1.1	1.4	1.4	1.4
15. Net Sls to Net Wkg Cptl	8.6	9.2	4.4	3.5	4.1	4.2
16. Net Sls to Net Worth	5.2	4.0	3.0	2.9	3.0	3.1
17. Inventory Turnover	(b)	(b)	(b)	(b)	(b)	5.6
18. Tot Liab to Net Worth	1.4	1.1	1.1	1.0	.8	.8
Selected Financial Factors *(in per cent)*						
19. Curr Liab to Net Worth	94.7	76.0	59.4	57.1	47.5	51.0
20. Inv to Curr Assets	31.9	46.0	48.0	41.1	44.6	44.0
21. Net Inc to Net Worth	16.7	13.4	7.7	4.6	8.1	7.9
22. Ret Earngs to Net Inc	94.5	99.3	88.1	71.1	49.0	57.0

*Depreciation largest factor

(Source: 51)

AIRCRAFT AND PARTS, AND COMPLETE GUIDED MISSILES AND SPACE VEHICLES (SIC 372, 1925)

Sales Volume Record of Total Industry

YEAR	DOLLAR SALES	INDEX
1948	1,525,562,000	100.0
1953	9,009,071,000	590.5
1958	12,736,080,000	834.8
1963	14,671,380,000	961.7
1964	16,527,270,000	1,083.4

Ratios or Percentages as indicated below (1964)	By Size of Assets *(in thousands of $)* A Under 500	B 500 to 2,499	C 2,500 to 9,999	D 10,000 to 49,999	E 50,000 and over	FOR THE TOTAL INDUSTRY
Selected Operating Factors *(in per cent of Net Sales)*						
1. Cost of Sales	69.8	72.3	74.2	82.2	80.3	80.1
2. Executive Salaries	7.5	2.9	2.2	.7	.1	.3
3. Rent	1.5	1.3	.9	1.2	.9	1.0
4. Repairs	.2	.5	.8	1.3	1.2	1.2
5. Bad Debts	.1	.9	.1	.1	.1	.1
6. Interest	.8	1.2	1.0	.8	.5	.5
7. Taxes (Excl Fed Inc Tax)	2.5	2.4	2.6	2.5	2.2	2.3
8. Contributions	(a)	.1	.1	(a)	.1	.1
9. Depr/Depl/Amortiz*	3.0	2.7	2.5	1.7	1.8	1.8
10. Advertising	.7	.2	.6	.3	.2	.2
11. Pensions & Benefits	.3	.7	1.1	1.8	2.2	2.1
12. Net Profit after Inc Tax	3.1	2.8	2.5	1.9	2.4	2.4
Selected Financial Ratios *(number of times ratio is to 1)*						
13. Current Ratio	1.7	1.4	2.0	2.4	1.7	1.7
14. Quick Ratio	1.1	.7	1.1	1.4	.7	.7
15. Net Sls to Net Wkg Cptl	8.2	9.4	4.6	3.6	5.6	5.5
16. Net Sls to Net Worth	5.4	4.0	3.1	2.9	4.8	4.6
17. Inventory Turnover	(b)	(b)	(b)	(b)	(b)	4.4
18. Tot Liab to Net Worth	4.4	1.3	1.2	.9	1.7	1.6
Selected Financial Factors *(in per cent)*						
19. Curr Liab to Net Worth	95.5	93.2	68.7	56.0	119.0	112.0
20. Inv to Curr Assets	32.7	51.5	45.9	40.6	60.7	59.0
21. Net Inc to Net Worth	16.5	11.2	7.7	5.6	11.3	10.8
22. Ret Earngs to Net Inc	94.5	96.5	88.8	74.8	60.2	62.6

*Depreciation largest factor

(Source: 51)

AIRCRAFT, GUIDED MISSILES AND SPACE VEHICLES COMPLETELY ASSEMBLED (SIC 3721, 1925)

Sales Volume Record of Total Industry

YEAR	DOLLAR SALES	INDEX
1948	(b)	—
1953	(b)	—
1958	8,625,133,000	100.0
1963	9,995,035,000	115.9
1964	11,431,715,000	132.5

Ratios or Percentages as indicated below (1964)	By Size of Assets *(in thousands of $)* A Under 500	B 500 to 2,499	C 2,500 to 9,999	D 10,000 to 49,999	E 50,000 and over	FOR THE TOTAL INDUSTRY
Selected Operating Factors *(in per cent of Net Sales)*						
1. Cost of Sales	89.4	77.2	(b)	82.8	80.2	80.3
2. Executive Salaries	2.3	3.0	1.6	.6	.1	.2
3. Rent	.9	.9	.3	1.2	.9	.9
4. Repairs	.4	.4	.2	1.8	1.0	1.0
5. Bad Debts	(b)	.4	(a)	(a)	.1	.1
6. Interest	.6	1.6	2.4	.8	.5	.5
7. Taxes (Excl Fed Inc Tax)	1.6	1.6	2.1	2.7	2.2	2.2
8. Contributions	(b)	.2	(b)	(a)	.1	.1
9. Depr/Depl/Amortiz*	.8	3.1	2.8	1.8	1.5	1.6
10. Advertising	(b)	.4	.6	.4	.1	.2
11. Pensions & Benefits	(b)	.5	.4	1.7	2.2	2.1
12. Net Profit after Inc Tax	(b)	(b)	1.9	2.9	2.3	2.3
Selected Financial Ratios *(number of times ratio is to 1)*						
13. Current Ratio	3.7	1.2	1.2	2.4	1.5	1.6
14. Quick Ratio	1.9	.4	.8	1.4	.5	.5
15. Net Sls to Net Wkg Cptl	3.4	11.4	9.3	3.9	6.5	6.4
16. Net Sls to Net Worth	14.0	3.9	3.9	2.8	6.0	5.8
17. Inventory Turnover	(b)	(b)	(b)	(b)	(b)	4.0
18. Tot Liab to Net Worth	5.6	2.5	3.5	.8	2.2	2.2
Selected Financial Factors *(in per cent)*						
19. Curr Liab to Net Worth	151.6	180.4	218.4	238.1	167.5	163.1
20. Inv to Curr Assets	50.0	67.2	29.4	39.3	65.8	65.1
21. Net Inc to Net Worth	(b)	(b)	7.5	8.2	13.5	13.2
22. Ret Earngs to Net Inc	(b)	(b)	100.0	79.8	64.8	65.4

*Depreciation largest factor

(Source: 51)

MANUFACTURING: TRANSPORTATION EQUIPMENT, EXCEPT MOTOR VEHICLES:
Aircraft, guided missiles, and parts

Item Description For accounting period 7/72 through 6/73	SIZE OF ASSETS IN THOUSANDS OF DOLLARS (000 OMITTED)										
	A Total	B Under 100	C 100 to 250	D 250 to 500	E 500 to 1,000	F 1000 to 5,000	G 5,000 to 10,000	H 10,000 25,000	I 25,000 to 50,000	J 50,000 to 100,000	K 100,000 and over
1 Total receipts (in millions of dollars)	25776.0	19.8	65.2	90.3	85.4	288.3	41.1	319.4	223.7	442.0	24200.2
Selected operating factors in percent of net sales											
2. Cost of operations	75.6	71.1	77.8	77.4	63.7	73.1	67.2	70.8	75.6	68.1	75.9
3. Compensation of officers	-	12.2	7.8	4.5	6.7	4.0	2.2	1.5	.9	1.3	-
4. Repairs	1.0	.5	-	-	-	-	.7	.6	.8	-	1.1
5. Bad debts	-	-	-	-	-	-	-	-	.5	.5	-
6. Rent on business property	1.1	1.6	1.1	1.6	1.6	1.2	.8	1.2	.9	1.3	1.1
7. Taxes (excl Federal tax)	3.0	5.4	3.9	3.1	4.1	3.3	3.6	3.4	2.1	3.3	2.9
8. Interest	2.3	3.4	2.8	2.0	1.2	1.8	-	2.2	2.5	1.6	2.4
9. Deprec/Deplet/Amortiz‡	3.5	3.8	3.8	2.5	4.4	3.9	2.0	3.5	1.4	2.4	3.5
10. Advertising	-	-	-	-	.7	-	-	-	.6	.9	-
11. Pensions & other benef plans	3.5	1.0	1.2	.6	2.4	1.4	2.2	1.5	.8	1.9	3.6
12. Other expenses	12.1	11.2	14.1	8.6	11.5	11.2	12.4	15.1	9.6	15.7	12.1
13. Net profit before Tax	•	•	•	•	3.0	•	8.2	•	4.4	2.7	•
Selected Financial Ratios (number of times ratio is to one)											
14. Current ratio	1.6	.5	.8	1.0	2.4	1.7	4.0	1.7	1.6	2.1	1.6
15. Quick ratio	.5	-	-	-	1.3	.8	2.0	.8	.5	.7	.5
16. Net sls to net wkg capital	4.0	-	-	37.5	3.0	4.3	2.2	4.1	3.9	3.1	4.0
17. Net sales to net worth	2.7	7.2	22.5	8.6	2.5	2.4	1.8	2.7	4.5	2.1	2.7
18. Inventory turnover	2.6	9.2	7.5	3.8	2.6	3.5	1.9	3.5	2.2	2.2	2.5
19. Total liab to net worth	1.7	3.9	9.8	5.0	1.1	1.1	-	1.4	2.9	1.0	1.7
Selected Financial Factors in percentages											
20. Current liab to net worth	99.2	-	-	-	59.2	80.8	26.1	89.8	185.1	61.4	99.8
21. Inventory to curr assets	49.0	27.8	49.4	54.3	41.3	43.2	41.9	40.5	54.7	48.4	49.2
22. Net income to net worth	3.7	-	-	6.1	6.8	-	9.3	-	20.9	6.8	3.7
23. Retained earn to net inc	16.1	-	-	100.0	91.4	-	84.7	-	92.5	96.8	12.9

‡Depreciation largest factor

(Source: 50)

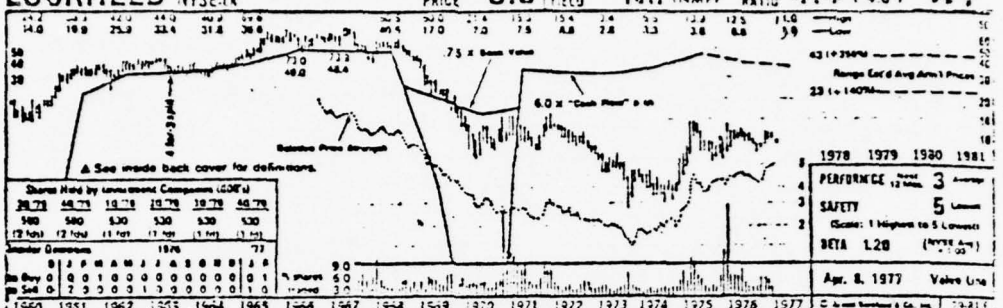
APPENDIX C

INVESTMENT ADVISORY SERVICE STOCK REPORTS

BEST AVAILABLE COPY

LOCKHEED NYSE-LK

RECENT PRICE 9.5 | DIV'D YIELD Nil (NORM Nil) | P/E RATIO 4.4 (NORM 9.0) | RISK 4



▲ See inside back cover for definitions.

PERFORMANCE (Next 12 Mths.) 3 (Average)
SAFETY 5 (Lowest) (Scale: 1 Highest to 5 Lowest)
BETA 1.20 (Next 5 Yrs. vs. Mkt.)

Shares Held by Investment Companies (000's)

3Q 75	4Q 75	1Q 76	2Q 76	3Q 76	4Q 76
580	580	530	530	530	530
(2 fcts)	(2 fcts)	(1 fct)	(1 fct)	(1 fct)	(1 fct)

Insider Decisions

	1976												1977
	J	F	M	A	M	J	J	A	S	O	N	D	J F
to Buy	0	0	0	1	0	0	0	0	0	0	0	0	0 1
to Sell	0	7	3	0	0	1	0	0	0	0	0	1	1 0

Apr. 8, 1977 Value Line

1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	© Value Line Publishing, Inc.	79-81
135.08	140.55	168.20	179.80	147.93	163.78	186.92	208.13	197.05	182.55	223.23	251.12	217.70	242.70	284.69	298.21	281.95	281.70	Sales per sh	375.00
d2.54	4.01	5.09	5.60	5.91	6.56	7.55	7.61	7.34	.93	d2.63	5.83	5.35	5.22	5.78	7.49	6.50	5.95	"Cash Flow" per sh	7.75
d4.37	2.50	3.57	4.06	4.18	4.69	5.29	4.85	3.38	d2.90	d7.50	1.02	1.15	1.24	2.04	3.86	3.10	2.20est	Earnings per sh	3.55
.23	.45	.90	1.30	1.60	2.00	2.20	2.20	2.20	1.70	--	--	--	--	--	--	--	NMF	Div'ds Decl'd per sh	.NMF
1.85	2.39	2.76	2.56	2.80	3.24	8.40	8.22	8.28	10.48	5.53	1.58	1.92	5.48	2.03	3.47	2.85	2.65	Cap'l Spending per sh	4.15
10.28	12.54	18.60	19.49	22.07	25.00	28.44	30.38	32.71	28.05	20.40	21.58	23.29	24.93	2.33	d37.61	429.75	422.40est	Tangible Book Value per sh	30
9.86	10.28	10.55	10.74	10.82	11.06	11.15	11.22	11.25	11.39	11.36	11.36	11.36	11.36	11.36	11.36	11.35	11.26est	Common Shs Outst'g (mill.)	12.00
--	12.8	10.2	9.5	8.7	10.7	11.5	12.7	12.3	--	--	10.2	9.7	5.2	2.1	2.1	3.0		Avg Ann'l P/E Ratio	9.0
1.2%	1.4%	2.5%	3.4%	4.4%	4.0%	3.6%	3.6%	4.2%	5.7%	--	--	--	--	--	--	--		Avg Ann'l Div'd Yield	NMF
2084.8	2536.3	2217.4	2074.8	2515.8	2552.4	2472.7	2758.8	3279.1	3387.2	3203.0	3200	Sales ($mill)	4500
8.4%	5.7%	5.2%	NMF	NMF	3.7%	4.7%	4.6%	5.2%	5.5%	5.5%	5.5%	Operating Margin	6.0%
25.4	31.0	38.1	43.9	54.4	54.9	47.8	45.2	42.4	39.8	38.0	40.0est	Depreciation ($mill)	48.0
58.9	54.4	44.5	d32.8	d55.3	11.8	13.0	14.1	23.2	45.3	38.7	33.0	Net Income ($mill)	65.0
45.1%	46.3%	43.2%	--	--	54.3%	51.0%	28.2%	33.5%	49.8%	57.0%	55.0%	Income Tax Rate	48.0%
2.8%	2.3%	2.0%	NMF	NMF	4%	5%	5%	7%	1.3%	1.2%	1.0%	Net Income Margin	1.4%
153.7	293.0	225.3	312.9	493.4	651.9	756.0	845.1	501.8	97.0	60.0	120	Working Cap'l ($mill)	700
189.1	140.0	138.1	339.3	534.4	707.5	760.6	853.2	831.0	813.0	675	650	Long-Term Debt ($mill)	950
317.6	343.8	370.7	321.0	224.9	250.2	256.4	283.2	265	75.3	155	193	Net Worth ($mill)	535
17.7%	17.0%	12.2%	NMF	NMF	8.0%	8.9%	4.3%	8.7%	8.3%	8.0%	8.0%	% Earned Total Cap'l	8.0%
18.5%	15.5%	12.0%	NMF	NMF	4.6%	4.9%	5.0%	87.6%	60.2%	23.5%	17.0%	% Earned Net Worth	12.0%
10.3%	8.5%	5.3%	NMF	NMF	4.6%	4.9%	5.0%	87.6%	60.2%	24.5%	21.0%	Earn'gs Plowback Ratio	18.5%
42%	45%	55%	NMF	--	--	--	--	--	--	3%	15%	% All Div'ds to Net Inc	25%

CAPITAL STRUCTURE as of 12/28/75

Debt $813.0m. Interest $67.5m. Earned 2.3 x (92% Cap'l) (Earnings coverage of total long- and short-term debt, 2.2 x)

Ind. $125 mill. 4 1/4% debs. ('92) callable 102.76, conv. into 13.79 shs.

Leases Unrecapitalized; annual rentals about $37.2 mill.

Pension Liability $329 mill. vs. $420 mill. in 1974

Pfd Stock None Pfd Div'd None

Common Stock 11,358,610 shares (8% of Cap'l)

Warrants 1.75 mill. @ $7 to '85

CURRENT POSITION

($mill.)	1973	1974	12/28/75
Cash Assets	78.1	122.2	58.3
Receivables	170.0	174.9	209.8
Inventory (Avg Cost)	1291.8	892.5	387.5
Other	25.3	88.1	110.8
Current Assets	1563.2	1277.7	766.4
Accts Payable	233.5	260.8	220.4
Debt Due	16.8	16.5	18.4
Other	468.0	498.6	420.8
Current Liabilities	718.1	775.9	669.4

ANNUAL RATES of change (per sh)

	Past 10 Yrs	Past 5 Yrs	Est '73-'75 to '79-'81
Sales	5.5%	6.5%	6.0%
Cash Flow	0.0%	26.5%	4.0%
Earnings	-6.0%	—	7.5%
Book Value	—	—	NMF
Dividends	—	—	NMF

QUARTERLY SALES ($ mill.)

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1973	615.5	728.8	584.9	829.7	2758.8
1974	715.7	922.1	704.1	937.2	3279.1
1975	747.5	975.7	802.4	861.6	3387.2
1976	863.2	835.9	729.3	773.6	3203.0
1977	900	850	750	800	3300

EARNINGS PER SHARE

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1973	.31	.39	.13	.41	1.24
1974	.33	.62	.51	.58	2.04
1975	.89	1.25	1.07	.68	3.85
1976	.92	.94	.75	.49	3.10
1977	.55	.60	.50	.55	2.20

QUARTERLY DIVIDENDS PAID

Calendar	Mar. 31	June 30	Sept. 30	Dec. 31	Full Year
1973					
1974					
1975	NO COMMON DIVIDENDS BEING PAID				
1976					
1977					

BUSINESS: Lockheed Aircraft Corp. is the largest defense contractor in the U.S. Aircraft production includes L-1011 TriStar airliner, C-130/L-100 transport, S-3A and P-3 antisubmarine warfare aircraft, and JetStar II corporate jet. Builds Trident and Poseidon missiles and Agena satellites. Also has interests in shipbuilding and electronics. U.S. government accounts for 65% of sales; exports 20%. labor, 40%. R&D (excl. govt funded) 1.4%. '75 Deprec. Rate: 5.4%. Has 57,600 emplys. 44,590 shrhldrs. Insiders control 4% of common. Chairman, R.W. Haack. Pres., L.O. Kitchen. Incorporated: California. Address: 2555 N. Hollywood Way, Burbank, California 91520.

Earnings are still on a downswing. The impact of lower L-1011 TriStar deliveries was felt throughout most of '76. Moreover, last October, Lockheed's banks: (1) converted $50 million of credit notes into a 9.5% preferred issue; (2) raised the interest on $350 million of notes to prime plus 1%, vs. 4%; and (3) received warrants to purchase 1.25 million common shares at $7 each and 500,000 at $10. Thus, net fixed charges rose about $2.5 million or 22¢ a share in the fourth quarter. Since a portion of the warrants was treated as common equivalents, Lockheed suffered additional dilution due to the increase in the number of primary shares. For 1977, the incremental fixed charges will expand by around $1.10 a share. And, despite strong military orders, a further easing in TriStar production (see below), may lead to an overall '77 profit contraction to $2.20 a share. The company estimates the use of inflation accounting methods would have added $49 million to last year's depreciation expense. Therefore, reported earnings but not "cash flow" would have been reduced by $4.30 a share.

L-1011 sales are way down. Last year, Lockheed delivered 26 of these widebody tri-jets, or nine fewer than in '75. While the '77 schedule calls for ten planes, the company will build only seven since three represent craft already in inventory.

Yes, there is a bright side! In '76, Lockheed's overall new funded orders totaled $8.4 billion, vs. $2.9 billion a year earlier. Firm backlogs were $4.4 billion as of last Dec. 31st which does not include $1.8 billion of negotiated but unfunded work such as the $710 million Canadian patrol plane order and the $625 million air traffic control contract in Saudi Arabia. This base of defense business will continue to carry the company as it has in the past. However, although by decade's end Lockheed's earning power should be on an upbeat which would support a stock price considerably above its recent quote, these speculative shares may only be able to mirror the market averages for the coming year.

F.P.G. /a.a.m.

Restated Sales (and Operating profit Margins) ($) by Product Line

	1973	1974	1976
Transp	382(6.6) 13%	730(10.8) 22%	555(10.8) 17%
Other Aircraft	117(7.5) 4%	100(7.9) 3%	145(8.1) 5%
Missiles, Space	935(7.5) 32%	967(8.3) 29%	1283(9.6) 40%
Shipbldg./Other	956(7.1) 33%	530(5.2) 16%	197(4.6) 6%
Consolid.	2473(7.1) 86%	2797(7.3) 84%	3328(7.7) 104%

(A) Based on avg. shs. outstanding. Excludes extraordinary gains: 71, 33¢; 72, 28¢; 73, 24¢; in 74, excl. writedown of deferred R&D, $24.74 a sh. Earnings report due early May.

(B) Plus stock 2%, '80

(C) In '75, excl. deferred charges of $502.5 mill., $44.23 a sh.

(D) In millions, adjusted for stock splits and divds.

(E) Before other income, interest and taxes.

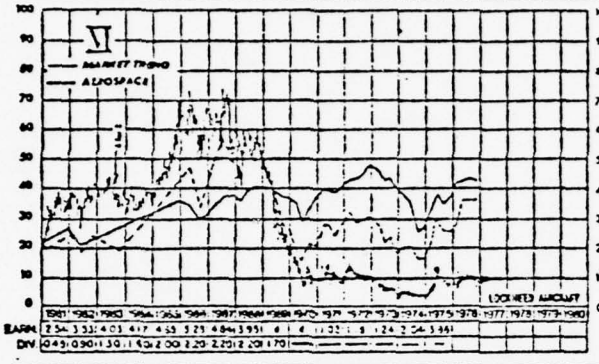
Price Stability: Score from 5 to 15
Growth Persistence (100 to 5): 15
Earnings Predictability: Lowest

(Source: 58)

LOCKHEED AIRCRAFT CORPORATION

LISTED	SYMBOL	INDICATED DIV.	RECENT PRICE	PRICE RANGE (1975)	YIELD
NYSE	LK	---	10	13 - 7	---

SPECULATIVE GRADE. ALTHOUGH COMMERCIAL AIRCRAFT DEMAND HAS EASED, MILITARY ACTIVITIES ARE BENEFITING FROM HIGHER DEFENSE SPENDING.



CAPITALIZATION:	(12/28/75) (000)	(%)
Debt	b$813,000	89.9
Com. & Surp.	75,300	8.4
Defer. & Surp.	15,700	1.7
Total	$904,000	100.0%

Shs.($1)-11,358,610

INTERIM EARNINGS:

Qu.	3/31	6/30	9/30	12/31
73c	0.31	0.39	0.13	0.41
74g	0.34	0.75	0.54	0.41
75	0.86	1.25	1.06	0.69
76	0.92	0.94	0.75	

DIVIDENDS: RECORD PAYABLE

Last div. $0.30 paid 12/8/69

BACKGROUND:

Lockheed Aircraft manufactures the L-1011 TriStar, Jet Star II, and the L-100 Hercules for commercial aviation. Military aircraft include the C-130 Hercules, S-3 ViKing, P-3 Orion, YC-141B Starlifter, and the GSA Galaxy. The Missiles and space group produce Agena space vehicles and Poseidon and Trident ballistic missiles. Other products include oceangoing ships, air traffic control and radar systems, and data handling devices and undersea petroleum systems. Lockheed also performs aircraft maintenance and fueling services and furnishes engineering service. Sales breakdown in 1975 approximated 64% U.S. Government, 23% commercial and 13% foreign government. In fiscal 1976, *Company ranked second among U.S. contractors in* sales to the Defense Department.

RECENT DEVELOPMENTS:

Lockheed's net income for the three months ended 9/30/76 fell 28% to $9.1 million as sales declined 24% to $729 million. TriStar losses were $28.1 million compared with $20.6 million in 1975. Pre-tax profits on non-TriStar programs were $60 million vs. $64 million a year ago. Financial restructing completed in October has increased owners' equity 26%. For the first nine months of 1976, the Company delivered 14 L-1011's. Sales were derived as follows: 69%, U.S. government; 20%, commercial customers; 11%, foreign governments.

PROSPECTS:

Earnings are likely to be depressed over the next few years. A major problem is the burdensome TriStar development costs, which consist of $500 million of initial planning, tooling and start-up costs, to be amortized against earnings at a rate of $50 million per year until 1985. The Company believes there is a potential market for about 300 Tri-Star models. The Company's funded backlog at the end of the third quarter was $4.07 billion, down 5%. Backlog is comprised of 40% U.S. government, 40% commercial and 20% foreign governments.

STATISTICS:

YEAR	GROSS REVS ($MILL.)	OPER. PROFIT MARGIN %	NET INCOME ($000)	WORK CAP. ($MILL.)	SENIOR CAPITAL ($MILL.)	SHARES (000)	EARN PER SH $	DIV PER SH $	DIV. PAY. %	PRICE RANGE	P/E RATIO	AVG. YIELD %
67	2,335.5	4.3	54,359	293.0	140.0	11,221	4.84	2.20	45	73⅞ - 48⅜	12.6	3.6
68	2,217.4	3.5	44,476	235.3	138.1	11,252	3.95	2.20	56	60⅜ - 40¼	12.8	4.4
69	2,074.6	d	d32,642	312.7	336.3	11,359	d2.87	1.70	-	50 - 17	-	5.1
70	2,535.6	d	d86,282	463.4	584.4	11,359	d7.60	Nil	-	21⅜ - 7	-	-
71	2,852.4	1.8	c11,610	651.6	707.5	11,359	c1.02	Nil	-	15⅝ - 7¼	11.2	-
72	2,472.7	2.8	c13,034	755.0	760.6	11,359	c1.15	Nil	-	15⅜ - 8⅛	10.5	-
73	2,756.8	3.0	c14,081	845.1	853.2	11,359	c1.24	Nil	-	9⅜ - 2⅛	4.9	-
74	3,279.1	3.9	g23,200	501.8	831.7	11,359	g2.04	Nil	-	5¼ - 3⅜	2.1	-
75	3,387.2	4.3	*45,300*	*970.0*	*813.0*	11,359	3.86	Nil	-	13⅞ - 3⅛	2.3	-
p76	3,200.0		38,700				3.10	Nil	-	12⅛ - 6⅝	3.1	-

b-Incl. $125.0 mill. debentures convertible into common at $72.50 a share. c-Before special items: 1971, $3.8 mill. (33c a share) credit; 1972, $3.2 mill. (23c a share) credit; 1973, $2.7 mill. (24c a share) credit. g-Reflects change to LIFO accounting.

INCORPORATED: June 21, 1932—California

PRINCIPAL OFFICE: 2555 No. Hollywood Way Burbank, California, 91520

ANNUAL MEETING: First Tuesday in May

NUMBER OF STOCKHOLDERS: 44,590

TRANSFER AGENT: Chemical Bank, N.Y. Company office

REGISTRAR: Manufacturers Hanover Trust Co, N.Y. United Calif. Bank, Los Angeles, Calif.

INSTIT. HOLDINGS: NO.: 15 SHS.: 584,816

OFFICERS

R.W. Haack, Chmn.
L.O. Kitchen, Pres. & Ch. Oper. Off.
J.J. Ryan, Secy.
R.R. McKeehan, Treasurer

(Source: 32)

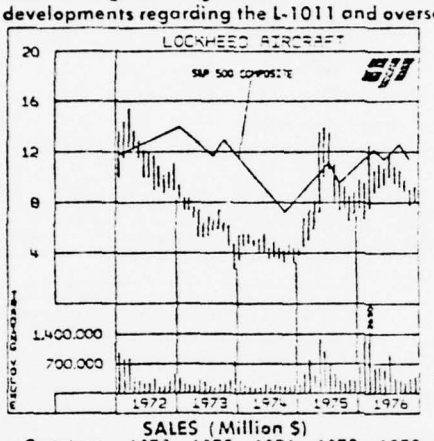
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LK[1] 1364

Lockheed Aircraft

Stock—	Price Jan. 6 '77	*P-E Ratio	Dividend	Yield
COMMON	10⅛	3	None	None

SUMMARY: Lockheed is a principal supplier to the U.S. Government of military aircraft and missiles and of space vehicles. Cost overruns on several programs and heavy financing requirements of the crucial L-1011 commercial jet have lowered cash reserves and necessitated large Government-guaranteed loans and a new financing plan by the company's principal banks. Implementation of the new plan has increased equity and stretched out debt maturities in exchange for higher interest rates and potentially dilutive stock purchase warrants. A sharp rise in L-1011 charges should have resulted in a large earnings decline in 1976. Further L-1011 charges and increased interest costs may cause an additional large earnings decline in 1977. Further out, earnings will be heavily affected by developments regarding the L-1011 and overseas business transactions.



SALES (Million $)

Quarter:	1976	1975	1974	1973	1972
March	863	748	716	616	494
June	837	876	922	727	673
Sept.	729	902	704	505	640
Dec.		862	937	830	666

Sales for the nine months ended September 30, 1976, were down 3.8% from those of the year-earlier period, reflecting lower deliveries of L-1011 and S-3A aircraft. Sharply higher profits on the C-130 aircraft program and lower interest costs outweighed the effects of the reduced volume and heavier L-1011 charges. Thus, the decline in pretax income was pared to 1.6%. After taxes at 60.0% against 53% (the higher rate due to increased tax rates on foreign earnings), net income fell 16.3%. Earnings equaled $2.61 a share, down from $3.18. On a fully diluted basis, share earnings were $2.38, compared with $2.83.

[2]COMMON SHARE EARNINGS ($)

Quarter:	1976	1975	1974	1973	1972
March	0.82	0.86	0.34	0.26	0.30
June	0.94	1.25	0.75	0.52	0.37
Sept.	0.75	1.06	0.54	0.07	0.22
Dec.		0.68	0.41	0.35	0.26

PROSPECTS

Near Term—Sales for 1976 are placed at $3.15 billion, down from 1975's $3.39 billion. Earnings are estimated at $3.00 a share, compared with $3.86.

Sales for 1977 should fall 5% or so, due to lower L-1011 and C-130 aircraft shipments.

Margins should narrow on the lower volume, increased L-1011 charges, and reduced C-130 program profits. With interest charges up sharply (due to restructured bank financing agreements), earnings for 1977 may decline 25% or so. Dividends are prohibited by loan agreements.

Long Term—It will be necessary for the company to sell a greatly increased number of L-1011 jets and receive ample bank financing in order to maintain satisfactory earnings levels.

RECENT DEVELOPMENTS

In April, 1976, the company signed a consent decree with the SEC, agreeing to avoid certain past business practices with respect to overseas business transactions. The decree also provided for a Special Review Committee of outside directors which will report to the U. S. District Court and the SEC. After this report (expected in the spring of 1977), LK can proceed with its annual meeting, postponed from November 5, 1975.

Reflecting a continued slowdown in the commercial jet market LK in 1975 changed its L-1011 accounting method by agreeing to write-off $515 million in previously inventorized costs ($12.5 million in 1975 and about $50 million each subsequent year to 1985).

Funded backlog at September 30, 1976, was $4.07 billion, down from $4.75 billion a year earlier.

Some 44 lawsuits, totaling over $350 million, have been filed against LK concerning a C-5A crash at Saigon Airport in April, 1975. LK has named the U.S. Government as a third party defendant and believes insurance is adequate to cover any liability.

[1]Listed N.Y.S.E., also listed Pacific S.E. & traded Boston, Cincinnati, Midwest & Philadelphia S.Es. [2]Primary earns. (based on avge. shs.) based on assumption of 300-plane TriStar program in 1972-74; reflects 1974 accts. change for TriStar program aft. 1972. *Based on latest 12 mos. earns.

(Source: 48)

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[1]INCOME STATISTICS (Million $) AND PER SHARE ($) DATA

Year Ended Dec. 31	Net Sales	% Oper. Inc. of Sales	Oper. Inc.	Depr. & Amort.	Net Bef. Taxes	——Common Share ($) Data—— [2]Net Inc.	[3]Earns.	*Funds Generated	Divs. Paid	Price Range	Price-Earns. Ratios HI LO
1976--	-----	--	-----	----	----	----	---	----	Nil	12⅛ - 6⅜	-----
1975--	3,387.2	5.5	187.10	39.80	90.20	45.30	[4]3.86	11.97	Nil	10¼ - 3¼	4- 1
1974--	3,279.10	5.2	168.90	42.40	34.90	23.20	2.04	5.78	Nil	5½ - 3¼	3- 2
1973--	2,756.79	4.6	127.32	45.22	19.62	14.08	1.24	5.22	Nil	9⅜ - 2¾	8- 2
1972--	2,372.73	4.7	116.27	47.77	27.73	13.03	1.15	5.35	Nil	15⅜ - 8¾	13- 8
1971--	2,852.37	3.7	106.77	54.58	25.38	11.61	1.02	5.83	Nil	15¼ - 7½	15- 7
1970--	2,535.60	def	d83.76	56.36	d160.00	d86.28	d7.60	d2.63	Nil	21⅜ - 7	-----
1969--	2,074.64	def	d27.32	43.94	d76.82	d32.64	d2.90	0.99	1.70	50 - 17	-----
1968--	2,217.37	5.2	114.87	38.09	78.27	44.48	[5]3.96	5.20	2.20	60⅜ - 40½	-----
1967--	2,335.46	5.6	131.88	30.99	99.42	54.36	4.86	8.37	2.20	73⅞ - 48⅜	15-10
1966--	2,084.76	6.4	132.74	25.35	107.28	58.88	5.29	7.14	2.20	73 - 49	14- 9

[1]PERTINENT BALANCE SHEET STATISTICS (Million $)

Dec. 31	Gross Prop.	Capital Expend.	Cash Items	Inventories	Receivables	——Current—— Asset	Liabs.	Net Workg. Cap.	Cur. Ratio	Long Term Debt	Shareholdrs. Equity	$ Book Val. Com. Sh.
1975--	732.6	39.4	58.3	387.5	209.8	766.4	669.4	97.0	1.1-1	813.0	75.3	6.63
1974--	709.1	23.1	122.2	892.5	174.9	1,277.7	775.9	501.8	1.6-1	831.7	26.5	2.33
1973--	707.8	62.2	76.1	1,291.8	170.0	1,563.2	718.1	845.1	2.2-1	853.2	283.2	24.93
1972--	661.6	21.8	89.0	1,065.8	174.9	1,361.2	605.2	756.0	2.2-1	760.6	266.4	23.45
1971--	660.5	17.7	101.7	851.4	181.5	1,165.1	513.5	651.6	2.3-1	707.5	250.2	22.03
1970--	662.9	63.5	79.5	693.9	179.1	971.9	503.5	468.4	1.9-1	584.4	234.8	20.67
1969--	608.8	119.0	52.1	500.4	359.1	926.9	614.2	312.7	1.5-1	336.3	321.0	28.26
1968--	500.7	93.2	106.7	285.7	258.4	663.2	428.0	235.3	1.5-1	138.1	370.7	32.94
1967--	419.3	69.8	91.7	274.7	264.2	660.2	367.2	293.0	1.8-1	140.0	349.8	31.17
1966--	355.6	71.4	25.2	285.5	206.5	546.8	377.0	169.7	1.5-1	16.9	317.6	28.48

[1]Data for 1973 & thereafter as originally reported; data for each yr. prior to 1973 as taken from subsequent yr.'s Annual Report; reflects acctg. change for TriStar program development costs aft. 1973. [2]In 1972-74 based on assumption of 300-plane TriStar program; bef. spec. crs. of $0.24 a sh. in 1973, $0.28 in 1972 & $0.34 in 1971. [3]Primary earns.; fully diluted sh. earns. were $3.49 in 1975 & $3.64 in 1968. [4]Excl. TriStar initial planning & tooling costs & unrecovered production start-up costs of delivered aircraft aft. 1974. [5]Deficit. *As computed by Standard & Poor's.

Fundamental Position

Lockheed Aircraft is a broad-based aerospace firm. In 1975 sales and program profits broke down as follows: L-1011 17% and a deficit of 64%, all other aircraft 43% and 131%, missiles and space 37% and 48%, and shipbuilding 3% and a deficit of 15%.

The most important commercial project is the L-1011 TriStar commercial jet. Thus far, orders and options total 203 with 138 deliveries. At June 27, 1976, of $268 million in L-1011 gross inventories (less $130 million in customer advance payments) realization of $158 million (representing production cost of aircraft in inventory or in process of manufacture) was subject to future deliveries.

Significant defense programs include the production of the Navy's S-3A anti-submarine aircraft and P-3 patrol bomber at the California division, the C-130 transport at the Georgia division, missiles for the Poseidon (and its successor Trident) programs and Agena space vehicles at the Missiles and Space subsidiary, and submarine tenders at the Shipbuilding and Construction Co.

Dividends which had been paid since 1948, were omitted in February, 1970.

Employees: 54,900. Shareholders: 44,590.

Finances

On October 27, 1976, after receiving approval of holders of its capital stock and convertible debentures, the company put into effect its new financing plan which increases equity and stretches out debt maturities in exchange for higher interest rates and additional stock purchase warrants. Under the plan, $400 million in bank credit notes was converted into $350 million of term loans extending to March 31, 1981 and $50 million of new 9.5% cumulative sinking fund preferred stock (raising equity as of September 30, 1976 to $159.3 million from $106.6 million). Banks will continue to make guaranteed loans to a $250 million maximum ($100 million currently taken down) through 1977, with a one-year extension possible. The term loans bear interest at prime plus 1% (versus 4% for the bank credit notes) until expiration of the Government guaranteed loans, then prime plus 1¼%; $7 million of deferred interest is payable after expiration of the Government guarantee. The banks also received additional 10-year warrants to buy 1,250,000 shares of LK common at $7 and 500,000 at $10.

Auditors qualified their opinion of the 1975 financial statements subject to the effects of L-1011 program developments, legal proceedings, and disclosure of commissions paid.

CAPITALIZATION

LONG TERM DEBT: $673,500,000, incl. $125,000,000 4¼% sub. debs. due 1992, conv. into common at $72.50 a share.

$9.50 CUM. PREFERRED STOCK: 500,000 shs. ($1 par); 75,000 shs. to be retired annually at $108 a sh. beg. Dec. 31, 1979.

COMMON STOCK: 11,358,610 shs. ($1 par).

WARRANTS: To purchase 1,750,000 shs. at $7.00 a sh thru Nov. 15, 1985 and 1,250,000 shs. at $7.00 and 500,000 shs. at $10, both thru Sept. 30, 1986. (All privately held.)

Incorporated in Cal. in 1932. Office—2555 North Hollywood Way, Burbank, Calif. 91520. Tel—(213) 847-6121. Pres—L. O. Kitchen. Secy—J. J. Ryan. VP-Treas—R. R. McKirahan. Dirs—R. W. Haack (Chrmn), R. A. Anderson, M. Berberian, C. Chappellet, D. M. Cochran, J. E. Cross, J. P. Downer, H. I. Flournoy, C. S. Gross, W. M. Hawkins, E. L. Hazard, J. K. Horton, C. L. Johnson, L. O. Kitchen, J. W. Newman, L. N. Shaw, F. M. Vinion, Jr. Transfer Agents—Company's Office; Chemical Bank, NYC. Registrars—Manufacturers Hanover Trust Co., NYC; United California Bank, Los Angeles.

Information has been obtained from sources believed to be reliable, but its accuracy and completeness, and that of the opinions based thereon, are not guaranteed. Printed in U. S. A.

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APPENDIX D

WORKSHEETS: FINANCIAL RATIOS AND TREND ANALYSIS

The worksheets illustrate the computations of those financial ratios mentioned in Section II of the financial analysis checklist. A trend analysis of those ratios is shown using eight years of financial data. The data source for the ratios is Lockheed Aircraft Corporation's 1976 10-K Report and Standard and Poor's N.Y.S.E. Stock Report on Lockheed (dated 12 January 1977). Lockheed was chosen as the example corporation because the data was on hand.

		INDUSTRY AVERAGE
I.	**LIQUIDITY RATIOS**	
a.	Current Ratio = $\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{838.8}{853.6} = .983$ times	1.9 times
b.	Quick Ratio = $\frac{\text{Current Assets - Inventory}}{\text{Current Liabilities}} = \frac{838.6 - 405.4}{853.6} = .51$ times	.9 times
c.	Working Capital = Current Assets - Current Liabilities = 838.8 - 853.6 = -14.8	NMF[a]
II.	**LEVERAGE RATIOS**	
a.	Debt Ratio = $\frac{\text{Total Debt}}{\text{Total Assets}} = \frac{853.6 + 436 + 436.2 + 125}{1585.9} = 89\%$	65%
b.	Current Debt to Net Worth = $\frac{\text{Current Liabilities}}{\text{Tangible Net Worth}} = \frac{853.6}{166.7} = 512\%$	59.5%
c.	Total Debt to Net Worth = $\frac{\text{Total Debt}}{\text{Tangible Net Worth}} = \frac{853.6 + 436.2 + 125}{166.7} = 84.9\%$	116.8%

[a]NMF is to designate no meaningful figure for comparison. In the case of working capital, the requirement for working capital will vary with the size of the firm.

III. EFFICIENCY RATIOS

		INDUSTRY AVERAGE
a.	Inventory Turnover = $\frac{\text{Net Sales}}{\text{Inventory}} = \frac{3202.7}{405.4}$ = 7.9 times	3.6 times
b.	Receivables Turnover = $\frac{\text{Net Sales}}{\text{Receivables}} = \frac{3202.7}{195.8}$ = 16.36 times	7.0 times
c.	Working Capital Turnover = $\frac{\text{Net Sales}}{\text{Working Capital}} = \frac{3202.7}{-14.8}$ = NMF[b]	3.9 times

IV. PROFITABILITY RATIOS

a.	Profit Margin = $\frac{\text{Net Profit after Taxes}}{\text{Net Sales}} = \frac{37.6}{3202.7}$ = 1.2%	4.5%
b.	ROI = $\frac{\text{Profit before Interest and Taxes}}{\text{Total Assets}} = \frac{147.7}{1585.9}$ = 9.3%	11.1%
c.	ROE = $\frac{\text{Net Profit after Taxes}}{\text{Net Worth}} = \frac{37.6}{166.7}$ = 22.6%	11.7%

[b] Lockheed has no meaningful working capital turnover value because the value is negative.

RATIO	YEAR 76	75	74	73	72	71	70	69
Current	0.98	1.1	1.6	2.2	2.2	2.3	1.9	1.5
Quick	0.51	0.57	0.50	0.38	0.49	0.61	0.55	0.69
Working Capital	-14.8	97.0	501.8	45.1	756.0	651.6	468.4	412.7
Debt	0.89	0.95	0.98	0.85	0.84	0.83	0.83	0.75
Current Debt to Net Worth	512%	889%	2928%	253.6%	227%	205.2%	214.4%	191.3%
Total Debt to Net Worth	849%	1969%	6066%	505%	513%	488%	436%	296%
Inventory Turnover	7.9	8.74	3.67	2.13	2.22	3.35	3.65	4.15
Receivables Turnover	16.36	16.14	18.75	16.22	13.57	15.72	14.16	5.78
Working Capital Turnover	NMF	34.92	6.53	3.26	3.14	4.38	5.41	6.63
Profit Margin	1.2%	1.34%	0.7%	0.5%	0.5%	0.4%	3.4%	1.6%
ROI	9.3%	5.8%	2.1%	1.1%	1.7%	1.7%	12.1%	6.0%
ROE	22.6%	60.1%	87.5%	5.0%	4.9%	4.64%	36.7%	10.2%

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