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AN EMPIRICAL STUDY OF EVALUATING "SUCCESSFUL EFFORTS" AND "FULL COST" METHODS OF ACCOUNTING FOR FINDING COSTS OF OIL AND GAS INDUSTRY FROM THE INVESTOR'S POINT OF VIEW

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APPROVED BY

DISSERTATION COMMITTEE

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ABSTRACT

Two alternative accounting methods of handling finding costs in oil and gas producing companies were evaluated in this study from the investor's point of view. These alternatives were the "successful efforts" method which capitalizes expenditures on successful ventures and expenses costs of unsuccessful ones, and the "full cost" method which capitalizes both productive and nonproductive expenditures and amortizes them on a composite rate based on aggregate reservoirs.

A mail survey was conducted to all financial analysts whose specialty was oil and gas securities. The following findings were based on the opinions of 310 participants (40.3% of the total).

1. The "successful efforts" method was highly favored over the "full cost" method (73% vs. 27%).

2. "Cash flow"--net operating income after adding back expenses which did not require the outlay of funds--was preferred for comparability of annual reports and projections to net income reported under both methods.

3. Difference of opinion between participants who favored the "successful efforts" or the "full cost" method for predicting earnings per share and rate of return on total assets was statistically insignificant.

4. Additional information were desired for inclusion in the annual reports of oil and gas producing companies. Among these were current expenditures on unsuccessful ventures, details of amortization of capitalized costs, value of recoverable reserves and deferred taxes.

5. Uniformity under the "successful efforts" method was highly desired. Such uniformity was recommended to be achieved through a uniform "successful efforts" method or a "Uniform Minimum Disclosure" statement prepared under a uniform "successful efforts" method.

6. When the participants were classified as CFAs or Non-CFAs, or by employment, position, or length of experience, their opinions under all classifications were in line with the overall opinions indicated above.

The following findings were based on the examination of the 1973 annual reports of 114 (of 186) oil and gas producing companies:

1. Both methods were equally popular among these companies.

2. The variety of practices under each method makes comparability between the annual reports of these companies too difficult, if not impossible.

3. All the information desired by the financial analysts, except for current expenditures on finding costs, were not adequately disclosed.

Given the paucity of comparable data, an exploratory study on the predictive power of both methods was based on data obtained from a few companies which reported their results under both methods for a five-year period. Accordingly, possible samples were only two. One of these consisted of 5 companies with contemporaneous reporting period (1964-1968), and the other sample consisted of 10 companies with non-contemporaneous reporting periods (between 1963 and 1973). Analysis of the data obtained for these samples tended to suggest the following tentative findings, which should be subject to future research:

1. The "full cost" method provided greater predictive power when dealing with reported earnings per share and rate of return on total assets.

2. The "successful efforts" method, however, provided the greatest predictive power when dealing with "cash flow" per share.

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CHAPTER I

INTRODUCTION

The oil and gas industry imposes a multitude of difficult and unique problems for the accounting profession. The oil and gas producing company is seeking a natural resource having an intrinsic value unrelated to the cost of finding or development.[1] A large amount of money may be spent to find a small quantity of oil and gas or, more likely, no oil or gas at all. On the other hand, a huge reservoir might be found with a relatively small expenditure. In either event, the value of the oil and gas discovered by a company has no predictable relationship to the costs of exploration and development. The problem of allocating costs of exploration and development is apparently acute in the petroleum industry where large amounts of money must be spent in exploration and development of a particular mineral deposit well in advance of the knowledge whether any oil and gas will be found.

The principal asset of an oil and gas producing company is its underground oil and gas reserves. The search for oil and gas is a high risk operation. Despite all the elaborate exploration methods in use today, uncertainty is still the most predictable characteristic of any oil and gas exploration activity. George S. Buchanan, Senior Vice-President of Husky Oil Company, stated:

> It is still possible with all the tools and techniques which today's exploration manager has at his call that he would not be fortunate enough to make a discovery.[2]

Uncertainty associated with costly exploratory activities in the oil and gas industry gave rise to different accounting practices, especially for unsuccessful exploration and development expenditures. The differences were enlarged with the emergence of the "full cost" accounting practice in 1959.[3] This practice has gained some popularity among the independent producers, but it has not been welcomed by most of the big integrated companies. The "full cost" method is apparently an addition to the "generally accepted accounting principles" and thus created problems for the petroleum industry.[4] Some accountants believe that the existence of alternative accounting practices for similar transactions and economic events may be confusing to the users of financial statements and, therefore, such differences need to be narrowed. Randal B. McDonald, Partner of Arthur Andersen & Co., stated:

> In recent years not only the accounting profession but many other interested groups have made a sincere effort to reduce these alternatives and, while some progress has been made, much remains to be done.[5]

Statement of the Problem

There is a long-standing controversy relative to which accounting treatment is more appropriate for finding costs in the oil and gas industry. Finding costs are defined, for the purpose of this study, as those expenditures incurred for the exploration and development of oil and gas. These expenditures include the costs attached to prospecting, geological and geophysical surveys, acquisitions, carrying properties, and exploratory drilling. Based on the review of contemporary literature concerning this subject, the problem appears to be causing increasing concern in the industry and in accounting. Currently, there are mainly two methods for handling finding costs: the conventional method, and the one most widely used, is known as the "successful efforts" costing method; and the alternative which appears to be gaining some acceptance. is the "full cost" method. The conventional method capitalizes successful ventures and currently expenses costs attached to unsuccessful ones. The "full cost" method capitalizes both productive and non-productive expenditures--as long as the total expenditures do not exceed the value of recoverable reserves--and amortize them on a composite rate based on the aggregate reservoirs. The purpose of this research is to

evaluate which of the two methods best serves present and potential investors.

Few research studies have been done in this area for a number of reasons. One of these reasons could probably be that the oil and gas industry, especially where finding costs are involved, is viewed by many as a complicated area. Based on the review of relative literature, and the growing magnitude of the problem, a research study of this nature appears to be timely.

Objective of the Study

The primary purpose of this study is to evaluate current practices of reporting finding costs of oil and gas producing companies from the point of view of the investor. In particular, the two controversial methods of accounting for finding costs: "successful efforts" costing method and "full cost" method were the main concern of this research. This objective is more narrowly defined as follows:

1. To perform an empirical field survey by utilizing the opinion of present financial analysts, whose specialty is oil and gas securities, as to which of the two methods is perceived as best for the investor and what additional information on finding costs should be published to improve financial reporting of the oil and gas producing companies.
2. To examine and evaluate present reporting procedures of finding costs of oil and gas producing companies.

Evaluation of these procedures was made to determine if such procedures adequately met the needs of investors in terms of financial statements comparability within the industry.

3. To perform an exploratory examination on the basis of historical data in order to study the ability of alternative finding costs accounting methods to produce data predictive of future earnings.
4. To present the findings of preceding investigations and suggest a solution for meeting the needs of the investor.

In summary, the above immediate and growing problem as to which finding costs accounting method is best for the investor was examined. This examination focused on what is presumed best for inclusion in present financial statements according to those who regularly recommend investment decisions.

Scope of the Study

Since the big integrated, multinational oil companies are engaged in many activities, the proportion of their exploration and development expenditures is not large enough to have significant impact on their financial statements. For example, Texaco, Inc., announced a release on February 13, 1973, to show the effect on its earnings by using the "full cost" method and deferring the effect of deducting intangible drilling costs for income tax purpose. In this release, the company stated:

> The net effect on the Company's earnings of these accounting policies from their inception, as compared with assumed alternative policies, has been minor. . . . The comparison shows that the effect has been a net reduction in reported earnings totaling $14.9 million over the entire period of 24 years during which the accounting policies involved have been followed.[6]

Therefore, such companies are not included in this study. The focus was on the companies whose major activity is exploring for and producing oil and gas. By limiting the scope of this study alternative accounting treatments of finding costs are likely to have greater impact on the annual reports of these companies.

The scope of this study was further delimited by focusing on financial analysts whose specialty is oil and gas securities. Thus, a large problem area was reduced to a more manageable proportion.

Hypotheses and Assumptions

In attempting to evaluate the two accounting methods within the scope of this study, primary hypotheses were:

1. In the opinion of oil and gas financial analysts, the "successful efforts" method of reporting finding costs of oil and gas producing companies is better for the investor than the "full cost" method.
2. Finding costs of oil and gas companies are adequately disclosed in a manner that meets the needs of oil and gas financial analysts for comparability between financial statements prepared under the "successful efforts" method or the "full cost" method.

3. When comparing the two methods in terms of their predictive ability of earnings per share and rate of return on total assets, the "full cost" method provides better predictive ability.

Some detailed hypotheses were tested in the process of analyzing the financial analysts opinion. Such hypotheses were indicated when deemed necessary in the course of this study.

One assumption of this research was that investors rely on published annual reports as their principal source of information about the company's economic activities and, therefore, data used for investigation were obtained from published financial statements. Another assumption was that individual stockholders are by and large inarticulate on matters of financial reporting and, therefore, financial analysts stand in the place of the investor and have become the most important users of published financial statements. For this reason, investigation in this research was directed to the opinions of the financial analysts in place of the investors.

Need for the Study

Despite all the elaborate exploration methods in use today, uncertainty is still the most predictable characteristic of any oil and gas exploration activity. High risk associated with exploratory activity was indicated by George S. Buchanan, Senior Vice-President of Husky Oil Company.

He stated:

> It is still possible with all the tools and techniques which today's exploration manager has at his call that he would not be fortunate enough to make a discovery.[7]

Latest statistics compiled and published by the American Petroleum Institute show that of all the new-field wildcats 91.51 percent were dry.[8] Also, less than 1% of new-field wildcat oil wells resulted in reserves of a million barrels or more.[9] Such risks may drive many investors away taking with them needed investment money. This problem may be amplified by being offered inconsistent financial measuring methods. In addition, the problem of alternative accounting treatments of finding costs may grow if the oil and gas companies increase their spending on the search for reservoirs.

Investors are, however, not the only recipients of the benefits of adequate financial reporting. The petroleum industry itself, if it is to increase its supply of oil and gas to meet projected demands, requires additional investment capital. This investment capital will, to a large extent, come from public investors, but only to the degree these investors feel confident in their investment. The results of this study are of primary importance to the Financial Accounting Standard Board (FASB) of the American Institute of Certified Public Accountants. Should the FASB address itself to the full-cost/successful efforts issue, it may decide to choose the practice which appears to

best serve in analyzing the oil and gas securities. The opinions and recommendations of the oil and gas financial analysts have been focused upon in this study.

Methodology

In a broad sense, the primary steps of investigating the problems of this research are summarized as follows:

1. Current literature on the subject was reviewed as indicated in the next chapter.
2. A questionnaire was mailed to all the financial analysts whose specialty was oil and gas securities. Names and addresses of those financial analysts were based on the 1974 membership of all the United States societies of financial analysts. The purpose of the questionnaire was to obtain the opinion of oil and gas financial analysts as to the evaluation of the two methods in terms of comparability of annual reports and their relative predictive ability. The questionnaire was also designed to obtain the financial analysts' recommendations for improving financial reporting of finding costs in the oil and gas industry.
3. Published annual reports of oil and gas producing companies available for the year 1973 were examined. The purpose of such an examination was twofold: to review current reporting practices of finding costs, and to determine the extent to which the items recommended by the financial analysts were disclosed in the financial

statements. Names of the companies were obtained from the 1972 Directory of Companies Filing Annual Reports with the Securities and Exchange Commission under the Securities Exchange Act of 1934.[10] Companies used for this examination were listed in this directory under companies whose major activity is crude petroleum and natural gas extraction.[11]

4. An exploratory study was made by using historical data of earning per share, "cash flow" per share, and rate of return on total assets to test the relative predictive ability of "successful efforts" and "full cost" methods. Given the paucity of comparable data, three samples of oil and gas producing companies were selected for this purpose. The first sample consisted of five companies which provided data under both the methods over a contemporaneous five-year period (1964-1968). The second sample consisted of ten companies which provided data under both the two methods but the five-year period was non-contemporaneous (between 1963 and 1973). These were all the companies which provided data under the two methods for a period of five years. This is because the practice of reporting the retroactive effect of shifting from one method of accounting to another was not commonly in use before 1968. The third sample consisted of 31 annual reports prepared under "successful efforts" method and 37 reports prepared under "full cost" method

for a contemporaneous five-year period (1969-1973).

Statistical techniques such as Chi-square tests, variance analysis, and simple and multiple regression analyses were used in the process of examining and evaluating results for this study. Details of the methodology will be described before discussing the results in later chapters.

Organization of the Study

In order to place the subject in proper setting, Chapter II presents a brief theoretical background of the study. Since this study is concerned with the evaluation of two alternative accounting methods from the investor's viewpoint, the presentation of the theoretical background starts with illustrating the significance of the investor's needs in determining accounting principles and practices, and the role of financial reporting in conveying the accounting message to the investor. This is followed by summarizing the arguments for and against the two alternative methods and the position of the accounting organizations. Chapter III outlines the methodology and results of the survey questionnaire sent to oil and gas financial analysts. Chapter IV outlines recent surveys of current accounting practices of finding costs of oil and gas. Disclosure of finding costs in the 1973 annual reports available for oil and gas producing companies is also examined and evaluated in Chapter IV. Chapter V presents the exploratory work on the evaluation of predictive ability of the two

alternative methods. Conclusions and recommendations of the study are included in Chapter VI.

Chapter I Footnotes

[1]Robert E. Field, "Financial Reporting in the Oil Industry," Price Waterhouse & Co. Review, vol. 19, no. 1 (1974), p. 7.

[2]George S. Buchanan, "Purpose and Obligation of Exploration," in Graham B. Moody, ed., Petroleum Exploration Handbook (New York: McGraw-Hill Book Company, Inc., 1961), pp. 2-4.

[3]John Paul Klingstedt, "Full Costing in the Petroleum Industry and Its Implications for Accounting Principles and Practices" (Ph.D. dissertation, North Texas University, Denton, 1969), p. 64.

[4]Ibid., p. 5.

[5]Randal B. McDonald, "Comparability of Corporate Financial Statements--Petroleum Industry," unpublished testimony before The Committee on Interior and Insular Affairs of the United States Senate, for presentation before Special Subcommittee on Integrated Oil Operations on February 21, 1974, p. 1.

[6]News from Texaco, Inc., published by Texaco Public Relations, New York (February 13, 1975), p. 1.

[7]Buchanan, "Purpose and Obligation of Exploration," pp. 2-4.

[8]American Petroleum Institute, Petroleum Facts & Figures, 1971, p. 28.

[9]Ibid., p. 29.

[10]Directory of Companies Filing Annual Reports with the Securities and Exchange Commission (Washington, D.C.: Securities and Exchange Commission, December, 1972).

[11]Ibid., pp. 219-223.

CHAPTER II

BACKGROUND OF THE STUDY

The purpose of this chapter is to present a brief review of accounting literature for illustrating the environment in which this study was involved. Since this study is mainly concerned with the point of view of the investor, this chapter focuses on the recognition of the investor's needs in accounting literature and pronouncements. Then, the chapter discusses the accounting concepts involved in accounting for finding costs of oil and gas. Finally, arguments for and against "successful efforts" and "full cost" methods, and the position of the accounting organizations were summarized.

The Significance of the Investor's Needs

The tendency to separate ownership and management has been a phenomenon of the modern corporate form of large enterprises. With a condition of detached and scattered investor-interests, Paton and Littleton stated that the service of accounting had necessarily been expanded; the function of reporting information to absentee investors had been added to that of recording and presenting data for owner-operator use.[1] Obligation which rests upon

corporation accounting to furnish dependable and relevant information is greatly increased by the extent of public interest in corporate affairs.

Herman W. Bevis, Partner of Price Waterhouse & Co., stated that the corporate financial report, nominally addressed to stockholders, also maintains a healthy corporation-society relationship. In his opinion, corporate profit is the strong connecting element, and the principle of full and fair disclosure underlying the corporate financial report is deeply imbedded in both corporate and social thinking.[2]

The utility of accounting data has been accepted tacitly, and perhaps intuitively for many years. George O'May stated in 1938:

> Accounting is "utilitarian" and the relative importance of different uses of accounts is subject to great and sometimes rapid changes.[3]

In his opinion, both the present and the potential investor are interested in corporate financial reporting. He stated:

> Investors are interested in reports of accountants on the affairs of business in which they already are, or contemplate becoming, security holders.[4]

Significance of the investors' needs was clearly indicated in Paton and Littleton's definition of a framework for the purpose of accounting:

> The purpose of accounting is to furnish financial data concerning a business enterprise, compiled and presented to meet needs of management, investors, and public.[5]

More attention has been given to the needs of the users of financial reports, especially those who have limited

access to information. In its report submitted to the American Institute of Certified Public Accountants in October 1973, the Study Group on the Objectives of Financial Statements concluded:

> An objective of financial statements is to serve primarily those users who have limited authority, ability, or resources to obtain information and who rely on financial statements as their principal source of information about an enterprise's economic activities.[6]

Management, creditors and government can obtain more information about the company than equity investors, except in such cases when the investors are dealing with equity on large scales. So, the above objective, which is the first one stated by the Study Group, is mainly intended to serve the investors with the least ability to obtain information and, consequently, the needs of others will be served as well.

Investors in equities endeavor to determine relative values among alternative investment opportunities. An investment is most attractive if it shows the greatest total return, allowing for the degree of risk relative to other alternatives. A wide variety of techniques are employed for investment analysis but the starting point is reported financial data which are primarily used to analyze the comparative historical trend of earnings. In a symposium trend in 1968 on Corporate Financial Reporting, William C. Norby, Past President of the Financial Analysts Federation and representing it in the symposium stated:

> Financial information is the heart of an analysis of a company's current position and of a projection of future earning power. While financial analysts may use these data in different ways, they all start on the presumption that the financial reports are accurate and consistent. To the extent that financial reports fall short of this standard, there can be no question that improved financial data can provide a better base for appraisal and projection of a company's earning power which in the long run should narrow the range of forecasts and hence investment values.[7]

Obviously, there is a complicated set of wide range variables--other than the raw magnitude of accounting numbers per se--that influence investment decision-making. However, despite the shortcomings of present financial reporting, the financial analyst normally begins his analysis with historical and current earnings, apparently with some adjustment to compare alternative investments. Some of these adjustments may be related to general and industry economic factors, or to investor psychology and subjective judgment and expectations.

The above background demonstrates the importance of the investor as a major user to whom the accounting message is communicated through published financial statements. Such importance requires that the investor's information needs be considered in preparing corporate annual reports. This emphasis has been indicated by Professor Nils H. Hakansson (of Yale University) in his article on "Normative Accounting and Theory of Decision."[8] He described the task of normative accounting theory:

> The task of normative accounting theory . . . is to specify, so to speak, what information should be communicated to what audience.[9]

After discussing the construction of normative accounting theory--focusing on the accounting aspects which are concerned with furnishing of information for decision-making purposes--Professor Hakansson concluded:

> The stage is now set for meaningfully defining the notion of reporting--relevant information. Essentially it is taken to be that subset of the decision-relevant information of the shareholder, present or prospective, the reporting of which (by the firm) is either "necessary" or "efficient" with respect to his computation of an optimal decision. . . . Finally, the reporting-relevant information of this model is examined and compared to the contents of reports based on the conventional accounting model.[10]

Thus, the needs of the receivers may well indicate the form and content of the accounting message. The questionnaire survey conducted in this research was developed to explore the expressed needs of the financial analysts who are dealing with oil and gas securities (see Chapter III). Such needs were then compared to the contents of recent published financial statements of the oil and gas producing companies (see Chapter IV).

Accounting Concepts Involved in Reporting Finding Costs of Oil and Gas

Financial reporting of oil and gas producing companies is subject to the Generally Accepted Accounting Principles. However, some accounting concepts are especially applicable to the petroleum industry and are important in evaluating accounting practices for finding cost of oil and gas. A

brief description of these concepts would be necessary as a background for this study. The description is not intended to discuss whether they are postulates, principles, concepts, conventions, or theories, but emphasis will be given to the meaning and the application of each. In particular, the following basic concepts will be described below: matching, expiration of cost, disclosure, and conservatism.

The Matching Concept

In business operations, expenditures are incurred with the anticipation that revenues in excess of the outlays will provide satisfactory return on investment. Within a reporting period, costs represent one measure of the enterprise's efforts and revenues represent the results of this effort. The Committee on the Matching Concept of the American Accounting Association stated:

> Costs constitute one measure of business efforts, and revenues represent accomplishments coming from those efforts. Appropriate reporting of costs and revenues should therefore relate costs with revenues in such a way as to disclose most vividly the relationship between efforts and accomplishments.[11]

The term "matching" is often applied in accounting to indicate the process of associating costs with revenue on a cause-and-effect basis. Such association can be direct or indirect. Examples of direct association with specific revenue are sales commissions and costs of products. Some assumptions regarding relationships are often made to accumulate costs. For example, manufacturing costs are attached

to products on bases of association such as labor hours, machine hours, or other bases. In the absence of a direct means of associating cause and effect, costs may be systematically and rationally allocated among specific accounting periods in which benefits are provided. Examples of these costs are depreciation, amortization and depletion. Other costs incurred during the current accounting period or capitalized in prior periods are immediately recognized and associated with the current period if they provide no discernible future benefits.[12]

Cost centers are established to provide a medium through which costs and revenues are accumulated and matched. The association of costs with benefits can then be determined in terms of completed product. The selection of a cost center depends on the management's objectives and information needs regarding the business operations. Once the cost center is selected, all expenses, direct and indirect, identified with that center can be reflected in the cost of the final product. Other indirect expenses, which cannot be rationally identifiable with one of the cost centers, are associated with the overall business enterprise and, consequently, such expenses are currently expensed unless they provide benefits for other periods as well.

Costs assigned to some units of the final products are deferred to future periods as long as these units are

not sold. Also, the costs absorbed by a unit of production in a large cost center is likely to be more than the costs allocated to the same unit if the cost center is smaller.[13] The reason for this difference of the cost per unit is largely because the costs associated with the overall business enterprise would be more when the cost center is smaller. Consequently, the larger the cost center and the number of unsold units of production at the end of the accounting period the greater the amount of expense are deferred to future periods. This problem is significant in reporting the results of oil and gas producing companies where large amounts of exploration and development costs are associated with underground reserves which are normally produced during a long period of time.

Expiration of Cost

One of the important problems of accounting is found within the asset-expense dichotomy. The central issue of this problem is based on the question of whether costs should be carried forward as assets or should they be recorded as an expiration--i.e., expenses or losses. Future benefits are conceived of as a yardstick for distinguishing expired from unexpired costs. The Committee on Concepts and Standards Underlying Corporate Financial Statements defined assets:

> They are aggregates of service potential available for or beneficial to expected operations.[14]

Assets are expired when they have "no discernible benefit to future operations."[15] Accounting Research Bulletin No. 43 also stated:

> When a cost is incurred the benefits of which may reasonably be expected to be realized over a period in the future, it should be charged against income over such a period.[16]

The problem of whether the cost has expired or not is especially applicable to the costs of finding oil and gas. When this concept is applied, it would not be acceptable to defer costs of unsuccessful activities for which no future benefit is anticipated.

Disclosure

The role of financial statements in communicating accounting data requires that full disclosure of all important and material accounting information be made. Including too much details in the financial statements may confuse the reader. On the other hand, condensation may be carried to an extreme that the financial statements lose much of its usefulness.[17]

The investor's information need should be reflected in the published financial statements as far as possible. Stockholders, as the addressee of corporate financial reports, and financial analysts have interests and information needs that should influence the nature and content of the published data. Herman W. Bevis, Partner of Price Waterhouse & Co., stated:

> The willingness of the multitude of distant investors to supply the capital must rest to a large extent on their confidence that, when the corporate financial report arrives, it will contain a full presentation of the financial position of the corporation and the results of its operations.[18]

The need for more disclosure in financial statements of oil and gas industry was pointed out by Robert E. Field, Partner of Price Waterhouse & Co. He stated:

> But even if full-cost companies were to switch to successful efforts accounting or successful efforts companies to full-cost, true comparability of reported operating results would not exist unless the annual reports include more information than is now given.[19]

Conservatism

Accounting principles and practices are often justified upon the ground of the convention of conservatism. The rule in this respect is "Never anticipate profit but provide for all loss."[20] The risks inherent in business, especially in the oil and gas industry, result in uncertainties surrounding the preparation of financial reports. These uncertainties are reflected in a general tendency toward early recognition of unfavorable events such as dry holes in the oil industry. Conservatism, however, should not appeal to intelligent individuals as a valid argument for defending untruths.[21] Thus, conservatism is not a justification of deliberate understatement. Rather, it is viewed as a modifying convention to assure that reasonable provisions are made for potential losses. Paul Grady stated:

> It is rather a quality of judgment to be exercised in evaluating the uncertainties and risks present in a

> business entity to assure that reasonable provisions are made for potential losses in the realization of recorded assets and in the settlement of actual and contingent liabilities.[22]

Statement No. 4 of the Accounting Principles Board also considered conservatism as a "modifying" convention of pervasive accounting principles.[23]

A research report of the National Association of Accountants (NAA) concluded that there was strong evidence of an attachment to accounting conservatism on part of both users and preparers of financial statements. The NAA report indicated that security analysts, who are also the main concern of this study, preferred to rely on conservatively constructed income base as a guide to future income projection, and they regarded the risk of a possible overstatement of income to be greater than an understatement.[24]

Arguments for and against "Successful Efforts" and "Full Cost" Methods

Proponents of either the "successful efforts" method or the "full cost" method contended, in general, the method they favor is more meaningful and yields greater comparability of annual reports than the other.[25] Specifically, main arguments of the proponents of each method are listed below.

Arguments of Proponents of the "Successful Efforts" Method

The views of those who advocate the "successful efforts" method are summarized as follows:

1. The "successful efforts" method is consistent with

conventional accounting because it capitalizes only finding costs which result in reservoirs. Thus, it upholds the traditional concept of assets--that they are economic resources which contribute to future earnings. Consequently, no basis exists for assuming that nonproductive finding costs have value which should be reflected on the balance sheet.[26] This is because such costs cannot be associated with future revenues. The "full cost" method, by capitalizing such costs, deports from traditional concepts of historical cost and move in the direction of a value system. This partial value system is not comparable to any other costing method in the oil and gas industry or, for that matter, in any other industry.[27]

2. There is a better matching of costs and revenues under the "successful efforts" method than under the "full cost" method whereby all costs lose their identification with specific oil and gas revenues. This is due to the lack of a cause and effect relationship under "full cost" accounting. Consequently, the "full cost" method, by capitalizing both productive and unproductive expenditures, tends to obscure relative success and failure of exploration and development efforts.[28]
3. Under the "successful efforts" method, losses from unproductive ventures are currently reflected in the company's financial statements. Such losses are obscured

by capitalizing them together with the costs of productive ventures under the "full cost" method.[29]

4. To capitalize and amortize unsuccessful exploratory costs results in the postponement of reporting the effects of such losses. By obscuring such losses, the "full cost" method inappropriately inflates current reported net income.[30]

Arguments of Proponents of the "Full Cost" Method

Those who advocate the "full cost" method support their position as follows:

1. Results of operations under the "full cost" method are not depressed, as they may be under the "successful efforts" method, by exploratory costs which are not related to current revenues.[31]
2. The oil company makes investments in widespread areas with expectation that many individual ventures will be fruitless and will eventually be abandoned. The costs incurred in all of those ventures are as necessary to the discovery process as are the costs necessary to manufacture a product.[32] Therefore, the "full cost" method--by capitalizing and amortizing both productive and unproductive exploratory costs--provides proper matching of costs with related revenues. If unproductive exploration costs are currently expensed, companies concentrating their efforts toward exploration rather than development of reserves may well report substantial losses. In this

case, such losses are reported under the "successful efforts" method when in fact the tangible worth of the company may be increasing by adding new oil and gas reservoirs.[33]

3. Financial statements under full-cost accounting show cumulative unamortized costs of exploration and development of existing reservoirs. Therefore, when such costs are presented with changes of reservoirs, ready comparison of cumulative and current results of exploration programs is permitted.[34]
4. By capitalizing and amortizing all exploration costs under the "full cost" method, the balance sheet reflects actual costs of mineral reserves. Assets, therefore, become closer to the value of reserves at the time of discovery than under conventional accounting.[35]
5. Elimination of "full cost" method would seriously curtail the exploratory efforts of small and medium-sized oil companies. This is because such companies would be unable to compete with major companies for funds in the securities market.[36]

The Position of Major Big Accounting Firms and Organizations Concerned with the Problem

Major Big Accounting Firms

There is disagreement among the big accounting firms as to which method is preferred. This can be seen from the position papers submitted by some of the big accounting

firms to the Committee on Extractive Industries of the Accounting Principles Board (of the AICPA) at the Public Hearing on November 22-23, 1971. Arthur Andersen & Co. strongly supported the "full cost" method. Their position is that the "full cost" method improves financial reporting of oil and gas exploration and development costs to investors and other users of financial statements in this industry.[37] Arthur Young & Company, on the other hand, indicated its general argument with the APB tentative approach of favoring the "successful efforts" method.[38] In its position paper, Touche Ross & Co. favored the "full cost" method as the appropriate method of accounting for oil and gas exploration costs.[39] Touche Ross & Co. justified its position by stating that the "full cost" method "embraces the economic realities of the industry, and it conceptually is the best possible approach in the proper matching of costs and revenues on an accrual basis."[40] But Price Waterhouse & Co. strongly supported the "successful efforts" method because it provides for greater comparability among individual companies by reflecting the relative success or failure of exploration and development efforts. The latter firm argued that the conservative results obtained under the "successful efforts" method are particularly appropriate in an industry where high risk and uncertainty are associated with capital expenditure. The position of the above firms should not be interpreted that they qualify their opinion on the annual

reports of companies following other than the method favored by them. To the contrary, such annual reports are certified with no qualification regarding the effect of the method used. This is simply because both methods are generally accepted.

The American Institute of Certified Public Accountants

Being aware of the significance of this problem, the American Institute of Certified Public Accountants devoted sizable effort to study reporting practices of oil and gas companies. In 1969, the Institute published its Research Study No. 11 on Financial Reporting in the Extractive Industries.[41] This was the first Accounting Research Study on reporting practices of a specific industry. This research study was concluded with nineteen recommendations based generally on the "successful efforts" method. The individual mineral deposit was chosen as the cost center by which costs are identified with specific minerals in place.[42] The Committee on Extractive Industries of the Accounting Principles Board, based on those recommendations and the comments received in response to the above research study, issued tentative conclusions to serve as a public hearing on November 22 and 23, 1971. Again, the above APB Committee tentatively concluded that the field should be selected as the recommended cost center.[43] APB Opinion No. 23 stated: "The Board continues to defer conclusions on intangible development costs in the oil and gas industry pending the issuance of an Opinion on extractive industries."[44]

The Financial Accounting Standards Board (FASB) continued to defer conclusions on these costs. Statement No. 2, issued by the FASB in October 1974 on accounting for research and development costs, indicated that it did not apply to finding costs of the extractive industries.[45] No subsequent opinion has yet been issued on the extractive industries. Thus, both the "successful efforts" and the "full cost" methods still qualify as generally accepted accounting procedures.

Securities and Exchange Commission

The Securities and Exchange Commission proposed Rule 3-8(a)4 to require that companies, which use generally accepted accounting principles other than the principle "in prevailing use among other companies in the same industry," publish the estimated dollar impact on net earnings of using the prevailing principle whenever the impact is significant. Release No. 5343 indicated that the individual property unit costing (successful efforts costing) is the prevailing principle in the petroleum industry. But the full-costers were opposed to this requirement because it favored the "successful efforts" method. They recommended that it would be better to require all petroleum companies to disclose additional information based on actual accounting practices.[46] The proposed rule, therefore, is still under consideration.

Federal Power Commission

The Federal Power Commission (FPC) was the first and the only authoritative body to make a choice between the two

methods. The FPC favored "full cost" method for financial reporting of pipeline companies only. Order No. 440-A, issued by the FPC on January 5, 1972, stated:

> In reaching our decision to adopt full-cost accounting, however, we compared the merits of the two concepts of accounting and concluded that full-cost accounting is more consistent with the economics of exploration and development over a period of time than current expensing of costs. . . . Further, having decided that full-cost accounting is the preferable method of accounting, it would be inappropriate for us to provide optional accounting.[47]

Although the FPC favored the "full cost" method for financial reporting of the pipeline companies, this method is not used for rate-making purposes.

Canadian Institute of Chartered Accountants

The Canadian Institute of Chartered Accountants did not take a position with respect to the two methods. Instead, it published in 1963 a research study by Professor W. B. Coutts, of the University of Toronto, on Accounting Problems in the Oil and Gas Industry.[48] This research study recommended the "area of interest" as the appropriate cost center.[49] This is normally a larger cost center than the "field" as tentatively recommended by the Committee on Extractive Industries of the Accounting Principles Board of the American Institute of Certified Public Accountants.

Predictive Ability Criterion for Evaluating Alternative Accounting Methods

The problem of using alternative accounting methods for similar transactions has been a phenomenon of financial

reporting. Controversies in accounting are mostly disputes over relative merits of one alternative over another. Yuji Ijiri, Professor of Industrial Administration at Carnegi-Mellon University, and Robert K. Jaedicke, Professor of Accounting at Stanford University, stated:

> Accounting is a measurement system which is plagued by the existence of alternative measurement methods. For many years accountants have been searching for criteria which can be used to choose the best measurement alternative.[50]

The idea that accounting data ought to be evaluated in terms of their usefulness for decision making is one of the most prevalent thoughts in accounting. The American Accounting Association viewed "usefulness of the information" as "the all-inclusive criterion."[51] Recently, the Accounting Objectives Study Group of the American Institute of Certified Public Accountants agreed with a fundamental function of financial accounting:

> The basic objective of financial statements is to provide information <u>useful</u> for <u>making economic decisions</u>.[52]

For accounting data to be useful for the investor's decision making, financial reports should provide information to aid him in predicting the enterprise's future earnings. Traditionally assumed in accounting, there is a relationship between the enterprise's historical data and its future performance.[53] Recent trend in accounting emphasizes the notion that financial reporting to investors ought to aid in predicting future performance of the business. This emphasis was expressed by the American Accounting

Association in its 1966 publication: "A Statement of Accounting Theory:"

> Almost all external users of financial information reported by profit-oriented firms are involved in efforts to predict the earnings of the firm for some future period. . . . The past earnings of the firm are considered to be the most important single item of information relevant to the prediction of future earnings. It follows from this that past earnings should be measured and disclosed in such a manner as to give the user as much aid as practicable in efforts to make this prediction with a minimum uncertainty.[54]

Robert T. Sprouse, Professor of Accounting at Stanford University, reiterated the belief that income reported to investor is primarily to aid him in projecting future income. He stated:

> The primary purpose of the measurement of last year's income reported to investors is to provide a basis for predicting future years' income.[55]

The Accounting Objectives Study Group of the American Institute of Certified Public Accountants concluded:

> An objective of financial statements is to provide users with information for predicting, comparing, and evaluating enterprise earning power.[56]

This conclusion, among others, was evaluated by the Committee on Concepts and Standards for External Financial Reports and was perceived to be a step forward that is worthy of general support.[57]

Investment decisions are not made within the framework of a formally specified decision model.[58] With this fact in mind, evaluating alternative accounting measures in terms of their predictive ability is considered an appealing idea because the predictive ability of accounting data can be

explored without waiting for further specification of the decision models. Thus, Professors William H. Beaver, John W. Kennelly, and William M. Voss, at the Universities of Chicago, Iowa, and Arkansas, respectively; drew an important relationship between predictions and decision-making:

> A prediction can be made without making a decision, but a decision cannot be made without, at least implicitly, making a prediction.[59]

Fundamental to the determination of the future potential of a corporation's stock and its quality and value relative to other securities is an appraisal of the enterprise earning power. Professor Philip A. Shade, at Colorado University, stated that the investor:

> . . . bases his opinions of the returns he can expect from the investment in the future on what others have earned in the past.[60]

The valuation of common stock generally involves two basic steps: the first is the preparation of some estimate of the probable range of earnings potential for the future, and the second step is the establishment of a reasonable price for the estimated earning power. Essential to the investors' evaluation of the enterprise earning potential for the future is the focus on some basic figures obtained from published annual reports. Most important of these figures are these: earnings per share, cash flow from operations per share, and rate of return on total assets.

The significance of earnings per share figure to investors' decisions regarding investment in common stock is

widely recognized in both the finance and the accounting literature. In the finance literature, for example, Norby, in a symposium on Corporate Financial Reporting (1968), stated:

> For the investor, of course, net earnings per share is the significant figure since his participation is proportionate. It is a small number which is more easily remembered and it permits a more ready comparison between companies of different sizes.[61]

Shade also stated:

> Any type of fundamental analysis of corporate earnings starts with obtaining the necessary accounting data on that company. . . . The investor must know, for example, what past earnings per share have been.[62]

In the accounting literature, Leonard Spacek views the earnings per share figure as the most significant single quantity measurement even to sophisticated investors:

> . . . reported profits are the factor which has the greatest influence on the public investor's judgement and is the one financial fact on which there is the greatest understanding of what the terminology mean. "Profit per share" is the most important single quantity measurement even by sophisticated investors.[63]

Cash flow from operations is another important figure to the financial analysts. The term "cash flow" is commonly used by the financial analysts to mean reported net income plus items on the income statement which do not require the outlay of funds--such as depreciation, depletion, and amortization. The term, as used in this manner, is likely to be the funds provided by operations which normally appears on the fund statement published with the other annual reports. Because of the popularity of the term "cash flow" and "cash flow per

share" among the financial analysts, these terms are frequently used in the corporation's annual statistics and information published with the financial statements. Perhaps this is done for the sake of simplicity or because the term is understood by the users of the data. The term, however, is a misnomer because "cash flow" encompasses both the inflows and outflows of cash. All noncash transactions should be excluded if accounting is based on the cash basis, and therefore, the simplified term "cash flow," as defined above, is not found in the financial statements certified by CPAs. However, discussing whether the term "cash flow from operations" or "cash flow" should be used is beyond the scope of this study. Since this study is concerned with evaluating the two alternative methods from the point of view of the investors, the term "cash flow" used in financial analysis was considered more convenient.

Under the "successful efforts" method, items which do not require the outlay of funds include in addition to depreciation such items as depletion, amortization, abandoned leases, and deferred intangible development, and dry hole expenses.[64] But under the "full cost" method, since no intangible development expenses, abandoned leases, or dry hole expenses are currently recognized, the amount added back to reported net income is normally limited to depreciation, depletion, and amortization calculated under this method.

In no sense can the amount of "cash flow"--as

defined above--be a substitute for "net income" properly measured. Alternative accounting methods applied to expenses which require no fund outlays may have induced the financial analysts to believe that the amount of "cash flow" is more indicative of the earning power than the reported "net income." This may be especially true when the total of such items is significant as in the case of the oil and gas industry. In his research study on "cash flow" and analysis quoted:

> In analyzing and comparing particular companies with one another, the investor should pay attention to the very useful yardstick known as cash earnings. . . . The use of cash earnings figures helps to iron out differences in accounting procedures among oil and gas companies.[65]

> Oil-industry analysts tend to base their real comparisons on "cash" earnings rather than reported net income because of the variation in the handling of property extinguishment costs. To facilitate such comparisons it is recommended that exploratory costs, amortization of intangible drilling costs, and depreciation and depletion be shown separately.[66]

In his article on "Preparing an Oil Share Analyzer," Michael Kourday stressed on the superiority of reported amount of "cash flow" over reported earnings:

> Perhaps the most revealing item to be derived from an oil company's income statement is "cash flow." As generally defined, this figure represents net income plus items on the income statement which require no cash outlay. . . . It is a better reflection of earnings power than is net income.[67]

Thus, the amount of "cash flow" per share was considered to be useful in evaluating the two alternative methods in terms of their predictive ability.

Rate of return on total assets is an important ratio derived from the relationship between reported net income and

total assets. This ratio is sometimes called the "profitability rate." It is widely used to measure management performance in terms of profitability of investing the assets under the management control. Shade considered the rate of return on total assets the best indicator in that respect:

> Since profitability is the best single measure of management efficiency . . . profitability is the ratio showing the percentage return that the firm is earning during a year on its asset base, i.e., it is the percentage of profit on total assets.[68]

Emphasis on the three items, earnings per share, cash flow per share, and rate of return on total assets, should not imply that these are the only useful items of information to the investor. The amount of return to investor, defined as dividends plus appreciation of stock, may be of equal importance. But, the effect of the two alternative methods on the market price of the stock was examined by others.[69] Therefore, returns to investors was not included in the scope of this study.

The "smoothing" effect of the "full cost" method on reported net income attracted the attention of a number of scholars. By spreading the losses from unsuccessful ventures over a long period of time, the "full cost" method may smooth reported net income in some instances. In his pioneer research on full costing in the petroleum industry, Dr. John Paul Klingstedt, Professor of Accounting at the University of Oklahoma, stated in 1968:

> In the growing company, just as in other classifications, the effect of a change to the full cost method of

> accounting is a significant raising and smoothing in reported income.[70]

In supporting this generalization, he emphasized that:

> A change to the full cost method of accounting for finding costs results in usually a material increase in the earnings of the concern. A similar absolute increase will occur in the carrying value of the oil and gas properties. An additional change is a definite smoothing or normalizing of reported earnings over a period of years.[71]

The question of why some oil and gas corporations favored the "full cost" method was well explained by his statement:

> The investors, however, will support corporate management only when it appears that the company is doing well. The raising and smoothing of reported income and the increasing asset values made possible through the use of the full cost method aid in presenting more favorable financial statements. Thus, the adoption of the full cost method of accounting for finding costs is the logical step for management to take in fulfilling its goals.[72]

A simulation analysis was made by Dr. Robert Kendrick Eskew in his doctoral dissertation completed in 1973.[73] The purpose of this simulation was to demonstrate the ways in which oil and gas expense stream, reported under either full costing or successful efforts costing, differ in the same simulated economic environment under a variety of conditions. Number of wells drilled annually, percentage of successful wells among those drilled each year, and life of a production well were systematically altered to produce information on the effect of the variables on the magnitude and variance of the reported expense stream. Eskew's conclusion from his simulation results that the "full cost" expense stream when compared with the "successful efforts" expense stream was

smaller and less variable.[74] Obviously, when exploration and development expenses is relatively significant in the income statement, the profit stream under "full cost" method would be larger and less variable when compared with the same stream under "successful efforts" method.

In his study made in 1974, Dr. John H. Myers, Professor of Accounting at Indiana University, constructed two hypothetical oil companies.[75] This was to determine the effect of choice of the "successful efforts" method or the "full cost" method upon their financial statements. The two companies were built up to maturity by identical economic transactions, then various changes were introduced to observe the results on the financial statements on the basis that one of the two companies was using the "successful efforts" method (with small cost centers), and the other company was using the "full cost" method (with a single, company-wide cost center). Among the major findings of Professor Myers simulation were:[76] (1) when the rate of success was held constant, decreased exploration resulted in increased net income of the "successful efforts" company, whereas the "full cost" company did not have declined net income in the period of declining exploration activity; (2) when the success rate of exploratory wells was changed with the same average amount per well, the income of the "successful efforts" company was strikingly different from what it was when the extra oil was found in the same number of wells; and (3) when an

offshore large activity was simulated, the successful efforts company showed a drastic reduction in income in the year of its biggest success. However, the results were inconclusive when several combinations of elementary changes were made. The net direction of annual profits was a result of the weight implicitly given to the various factors.

Predictive ability, however, is only one criterion, among others, for evaluating accounting alternative method. Therefore, if one of the two methods provided better predictive ability, it should not be implied that this is the best of the two methods. Moreover, general and specific limitations of projections should be kept in mind before drawing unwarranted conclusions. In terms of general limitations of predictive ability evaluation, one should agree with the concluding remarks of Beaver, Kennelly, and Voss:

> (1) The preference for an accounting measure may apply only to the context of a specific predictive purpose or prediction model. It may be impossible to generalize about the "best" measurement alternative across different context. (2) Even within a specific context, the conclusion must be considered as tentative.[77]

Summary

Accounting practices of reporting finding costs of the oil and gas industry are subject to the Generally Accepted Accounting Principles. With the emergence of the "full cost" method, accounting and other organizations concerned with the oil industry are attempting to solve the problem of the divergent practices in accounting for finding costs. But the

problem has not yet been solved. Whereas the American Institute of Certified Public Accountants and the Securities Exchange Commission tended to favor the "successful efforts" method, the Federal Power Commission ruled that the "full cost" method should be used for financial reporting of pipeline companies (but not for rate-making purposes).

Published position papers indicated that there is no agreement among the big accounting firms about favoring either the "successful efforts" method or the "full cost" method. Proponents of each method contended, in general, that the method they favor is more meaningful and yields greater comparability of the annual reports of oil and gas producing companies. The major arguments for each method are summarized as follows. Those who advocated the "successful efforts" method argued that:

1. The successful efforts method is consistent with traditional accounting.
2. The "successful efforts" method provides a better matching of costs with related revenues.
3. Loss from unsuccessful ventures are currently reflected in the annual reports.
4. The "full cost" method inappropriately inflates current reported income.

Those who favored the "full cost" method supported their position as follows:

1. The results under the "full cost" method are not depressed

by exploratory costs which are not related to current revenues.

2. The "full cost" method provides a better matching of costs with related revenues because discoveries are unlikely without incurrence of unsuccessful ventures
3. When presented with changes of reservoirs, the "full cost" method permits ready comparison of cumulative and current results of exploration programs.
4. Under the "full cost" method, the balance sheet reflects actual costs of mineral reserves.
5. The "full cost" method encourages exploration and development of reservoirs.

For the purpose of this study, the opinions of the financial analysts on the preceding arguments were obtained through a questionnaire as indicated in the following chapter. The questionnaire included other questions such as whether the financial analysts favor "cash flow" figures over net income reported under one of the two alternative methods. Other questions were designed to obtain their opinions as to which of the two methods provides relative projections of earnings per share and rate of return on total assets, and their recommendations for improving the present financial reporting of finding costs of oil and gas. Comparison of the expressed needs of the financial analysts to the contents of current published of the oil and gas producing companies will be shown in Chapter IV of this study.

The predictive ability has been indicated as one of the criterion for evaluating the alternative accounting method. An attempt was made to evaluate the predictability of earnings per share, "cash flow" per share, and the rate of return on total assets under each of the "successful efforts" method and the "full cost" method. Such an exploratory work will be summarized and discussed in Chapter V of this study.

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[53]Werner Frank, "A Study of the Predictive Significance of Two Income Measures," Journal of Accounting Research (Spring, 1969), p. 123.

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[55]Robert T. Sprouse, "The Measurement of Financial Position and Income: Purpose and Procedure," in Robert E. Jaedicke, Yuji Ijiri, and Oswald Nielson, eds., Research in Accounting Measurement (American Accounting Association, 1966), p. 106.

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[67]Michael Kourday, "Preparing an Oil Share Analyzer," The Analysts Journal (February, 1957), p. 39.

[68]Shade, Common Stocks, p. 97.

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[70]John Paul Klingstedt, "Full Costing in the Petroleum Industry and Its Implication for Accounting Principles and Practices," doctoral dissertation, North Texas State University, 1969, p. 176 (emphasis supplied).

[71]Ibid., p. 177.

[72]Ibid., pp. 177, 178 (emphasis supplied).

[73]Eskew, An Empirical Examination of the Interaction between Accounting Alternatives and Share Price in the Extractive Petroleum Industry, pp. 60-98.

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[75]John H. Myers, Full Cost vs. Successful Efforts in Petroleum Accounting, An Empirical Approach (Ad Hoc Committee, Petroleum Companies, on Full Cost Accounting, 1974).

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CHAPTER III

THE QUESTIONNAIRE USED IN THE STUDY

The significance of published annual reports as a starting point of investment decision-making, it was of primary importance, in the process of evaluating reporting practices of finding costs of oil and gas, to consider the opinion of those who make the investment decisions. One of the purposes of this research was to conduct a survey by mailing a questionnaire to the financial analysts to obtain their opinions as to which of the two methods of accounting ("successful efforts" and "full cost" methods) best served the investors needs, and what information should be published to improve current practices of reporting finding costs. The first part of this chapter describes the methodology used in conducting the survey and summarizing its results. In the second part, results are analyzed and discussed.

Methodology

The methodology of conducting this survey and analyzing its results is described under the following titles: sample selection, development of the questionnaire, mailing the questionnaire, contents of the questionnaire, methodology of data analysis, and reliability of the results.

Sample Selection

An oil share analyst needs to be aware of the problematic areas of this industry, especially those of financial reporting. A questionnaire directed to a non-specialist financial analyst on the evaluation of reporting practices of finding costs would be meaningless. Such a questionnaire might not be answered because the financial analyst may not be qualified to do so. If it were answered, results would most likely be misleading.

It was decided, therefore, to send the questionnaire to those financial analysts whose specialty was in oil and gas securities. Whether the financial analyst was certified (CFA) or not was insignificant for the purpose of this research. The response of a non-certified specialist would felt to be more reliable than a guess made by a non-specialist certified financial analyst (CFA). This was found to be the case when a number of personal interviews with some financial analysts were made in New York City to discuss the proposed questionnaire. During these interviews, the Membership Directory of The Financial Analysts Federation was suggested as a source for obtaining names and addresses of the specialists on oil and gas securities.

The 1974 Directory of the Financial Analysts Federation[1] was used for selecting the analysts to be surveyed in this research. In this Directory, the members of 39 American financial analysts societies were listed. Letters in

parentheses following names of members signified their industry specialty. It was noticed that the majority of oil and gas specialists were associated with The New York Society of Security Analysts. Therefore, an updated list of oil and gas specialists who were members of this society in December, 1974, was obtained and used for the survey.

The total number of members who indicated a specialty in oil or gas securities in the Directory was 880 in all the United States societies. Members of the New York Society only indicating such a specialty represented 647 of this total. Findings of other research studies based on a mailed questionnaire revealed that low response had been received from financial analysts:

> Thomas Glenvall Estes, Jr., was successful in getting 32.7 percent (98/300) return from the members of the Financial Analysts Federation (Estes, Autumn, 1968, p. 202). Stallman got only 12 percent (121/1068) usable replies from a similar sample (Stallman, 1969, pp. 35-36.[2]

These experiences were considered in determining the sample size for this research. In order to maximize the number of responses, it was decided to mail the questionnaire to all the 880 financial analysts whose specialty was oil and gas securities. A carefully designed questionnaire and a timely follow up was used to obtain a fairly good response.

Development of the Questionnaire

The questionnaire used in this research was in fact one of the important channels through which empirical data could be obtained. Developing an effective communication

through this channel was far from easy. The final questionnaire was prepared after a number of revisions. A pilot study was made to ascertain the content validity of the questionnaire. In particular, personal interviews were made with oil and gas financial analysts in New York City to discuss the questions included. Also, some professors of accounting and finance at the University of Oklahoma reviewed the questionnaire and their comments were very helpful. The last revision was made to minimize the number of questions and still cover the subject (see Appendix A, Exhibit 5). Undoubtedly, well designed and printed questionnaire, combined with contents of primary interest of the respondents, contributed to the success and effectiveness of this channel of communication. This is especially true because previous experience with mailed questionnaire to financial analysts indicated that low response could be expected.

Mailing the Questionnaire

The questionnaire was mailed to the 880 financial analysts specialized in oil and gas securities on December 27, 1974. A covering letter was attached to introduce the questionnaire and to solicit a prompt response (see Appendix A, Exhibit 1). This letter was sent to avoid any confusion regarding the meaning of the two accounting methods which were the subject of the questionnaire. Therefore, the letter identified the broad lines which distinguished each of these

methods. For the convenience of respondents, a self-addressed and stamped return envelope was enclosed with the questionnaire. Forty days were allowed to receive the responses, to the first questionnaire. A follow-up letter including another questionnaire was mailed on February 5, 1975, to those who did not respond to the first request (see Appendix A, Exhibit 2). Two months were allowed for receiving responses to the second request. April 7, 1975, was considered the cut-off date for including the responses in the results of the survey. This date was determined after no response had been received for fifteen days.

Contents of the Questionnaire

Some classifications were included at the top of the questionnaire to identify the respondent (see a copy of the questionnaire--Appendix A, Exhibit 5). These classifications were: (1) in terms of his present employment; whether he worked for a national, a regional, or a local firm, (2) in terms of his position; whether he was a partner, a manager, an analyst, or had another position, and (3) in terms of his experience; whether he had 0-5 years, 6-10 years, or over 10 years of experience. When the respondent did not indicate whether the firm for which he worked was a national, a regional, or local firm; a classification was given according to the kind of the firm's business. International and big oil companies such as Exxon Co., and Federal Agencies such as U.S. Treasury Department, were

included under national firms. Banks and other companies were considered regional firms. When the respondent's personal address was only indicated in the Directory, the firm was classified as local.

The questionnaire consisted of three parts. The first part was concerned with the analysts views of the comparability of annual reports prepared under one of the two accounting methods ("successful efforts" or "full cost"), the second part focused on the analysts views of the relative predictive ability of the two methods, and the third part included the analysts recommendations for improving financial reporting of finding costs and oil and gas reserves. In the first part, comparability of annual reports, the major question was intended to explore the financial analysts opinion as to which of the two methods yields relatively greater comparability and what are the reasons supporting such an opinion. It was necessary to test the truth of the popular notion that the financial analysts prefer the "cash flow" figure (cash flow from operations) to the reported net income for their analysis. Therefore, an important question was included as to whether "cash flow" figure is more reliable for comparability and predictions than reported net income under either or both the two methods. Questions in the second part were aimed at comparing relative predictive ability of the two methods in terms of earnings per share, rate of return on total assets, and returns to investor (dividends

plus appreciation of stock).

Recommendations included in the third part focused upon two groups of questions. The first group was concerned with the kind of additional information which the financial analyst would recommend for inclusion in published annual reports of oil and gas producing companies. Opinions of the financial analysts were requested as to the extent to which the inclusion of six items in the annual reports would be necessary. These items are: current expenditures on finding activities, amount currently expensed for costs of unsuccessful ventures, details of computing current amortization of capitalized finding costs, the value of recoverable reserves, and deferred income tax for differences between book and tax treatment of finding costs. The second group of questions focused on the uniformity of published annual reports.

It was important to know the opinion of the financial analysts, who are the major users of published annual reports, as to whether they recommend that financial statements of oil and gas producing companies should be reported under a uniform "successful efforts" method or a uniform "full cost" method. The financial analysts were also asked whether they recommend a "uniform minimum disclosure" statement prepared under a uniform "successful efforts" method or under a uniform "full cost" method. The attractive idea of the "uniform minimum disclosure" statement, as a solution to problem of

uniformity vs. flexibility, was borrowed from Dr. Homer A. Brown's research on Financial Statements for External Analysts.[3] This type of statement maintains the flexibility of reporting under generally accepted accounting principles, but requires that only one standard method would be acceptable in the firm's "uniform minimum disclosure" statement.

Methodology of Data Analysis

The total number of oil and gas financial analysts listed in the 1974 Directory of the Financial Analysts Federation was 880, as previously indicated. Of this total, 110 letters were returned for such reasons as the financial analyst no longer follows oil and gas securities, had left the firm with which he was associated, or deceased. The population was, therefore, reduced to 770 oil and gas financial analysts.

Data obtained from the responses were summarized and tabulated (see Appendix B, Exhibits 2, 3, and 4). Respondents were classified as follows: (1) by certification: Certified Financial Analysts (CFA) and those who are not certified; (2) by employment: respondents working for national, regional, and local firms; (3) by position: partners, managers, analysts, and other positions; and (4) by length of experience as analysts: respondents having 0-5 years, 6-10 years, or over 10 years of experience. Under each of these classifications, the data obtained from the questionnaire were tabulated as shown in Appendix B,

Exhibits 5 through 12.

Descriptive statistics such as percentages used for tabulating the result were self-explanatory of the opinion of the majority of the respondents on all important questions. For example, 73 percent vs. 27 percent favored the "successful efforts" method over the "full cost" method (Question #1), or 99 percent recommended publishing current expenditure of finding activities, etc. However, it was decided to use the Chi-square test for evaluating the results as to whether the response with greater proportion would be acceptable, at a reasonable level of significance, as representing the respondents' general opinion. In particular, the test was made to determine whether to accept or reject the hypothesis that there is no significant difference between proportions of "Yes" and "No" responses at 0.05 level of significance. In place of "Yes" or "No", this test was applied to the second part of the questionnaire for proportions of responses favoring "successful efforts" or "full cost" method in terms of its relative predictive ability. For recommendations in the last part of the questionnaire, responses were tested as between two groups. One group consisted of responses which strongly recommended or recommended the item indicated in the questionnaire, and the other group consisted of responses which considered the item not particularly useful or unnecessary.

It was also necessary to determine whether the general results of each question obtained from the previous step was not significantly affected by one or more of the respondents groups. The question, for example, could be raised as to whether the opinion of the certified financial analysts was significantly different from the opinion of those who were not certified, whether the opinion of the respondents working for a national firm is significantly different from the opinion of those working for regional or local firms, and whether the opinion of the respondents were dependent on the period of experience, etc. Variance analysis technique was considered more appropriate than Chi-square test in this respect. The analysis of variance was accomplished by using the computer program BMD 07D, "Description of Strata with Histograms."[4] Accordingly, means and standard deviations for each group, and an analysis of variance table were computed. When mean differences were explored, the "F" ratio was computed to determine the significance. In particular, the "F" test was made for each question to show differences in opinions of different classifications within each of the following groups: (1) certified and non-certified financial analysts; (2) respondents working for national, regional, and local firms; (3) partners, managers, analysts and other; and (4) respondents with 0-5 years, 6-10 years, and over 10 years of experience. Thus, analysis of variance procedures were used to test the hypothesis that there is no

significant difference between the opinion of respondents under each of the above classifications within each group. When computed "F" is below the critical "F" value with appropriate degrees of freedom at 0.05 level of significance, the hypothesis was accepted. In other words, the general opinion of the respondents would be the same despite differences in their classification.

Reliability of the Results

A common problem which faces every researcher using mail questionnaire is the possible bias resulting from nonresponse. But this does not necessarily mean that no intelligent judgments can be derived from a questionnaire with some nonresponses. Some facts or characteristics normally enhance the confidence in questionnaire results. First of all, large percentage of responses is essential in evaluating the results. Paul E. Green and Donald S. Tull stated that the modal response rate of mail questionnaire is of the order of 20 to 40 percent.[5] Morton Baker, Professor of Accounting at the University of Massachusetts, and Walter B. McFarland, Research Director at the National Association of Accountants, selected from the financial analysts only 72 for interview in 1968. They stated: "It seems reasonable to expect that the interviewees are representatives of skilled professional users of financial reports of investment decisions."[6] David M. Robinson argued that a 30 percent response would be representative if combined with the homogeneity of

the population. He stated:

> The fact that mail survey is of a sample of a homogeneous population may be a sufficient reason for the researcher to make the practical assumption that returns of 30 percent are at least representative enough for the information gathered to be used.[7]

In terms of size, responses received for this research were considered to be ample in both number and proportion. The number of usable responses was 310 which represented 40.3 percent of the population. The questionnaire was administered to a special group of financial analysts within the same specialty (oil and gas securities). Homogeneity of the population is, therefore, obvious.

The distribution of responses was also examined so that a judgment could be made about whether these responses were likely to be representative of the population. Geographically, Table 3-1 shows the number of responses received from members of each U.S. financial analysts society compared with total number of the society members whose specialty is oil and gas securities. This tabulation was made primarily to show how each society having more than one oil and gas specialist was represented by responses. It can be seen that the responses were received from members of all the societies except four which had only one oil and gas specialist in each.

In addition, the composition of respondents was examined. A tabulation was made to show the number of respondents in terms of their certification (CFA and

TABLE 3-1

DISTRIBUTION OF OIL AND GAS SECURITY ANALYSTS AND THEIR RESPONSES TO THE QUESTIONNAIRE

U.S. Society* at	Total No. of Oil Analysts**	No. of Analysts Not Qualified***	Net	No. of Usable Responses	Percentage of Usable Responses
Atlanta	3	(1)	2	1	50%
Austin/San Antonio	4	(1)	3	1	33%
Baltimore	1		1	1	100%
Boston	35	(4)	31	11	35%
Chicago	25	(6)	19	10	53%
Cincinnati	1		1	0	0
Cleveland	6		6	5	83%
Columbus	0		0	0	0
Dallas	12	(3)	9	5	56%
Denver	3		3	1	33%
DeMoines	3		3	2	67%
Detroit	8	(1)	7	1	14%
Hartford	17	(2)	15	8	53%
Houston	12	(1)	11	5	45%
Indianapolis	2		2	1	50%
Jacksonville	0		0	0	0
Kansas City (Missouri)	3	(1)	2	2	100%
Los Angeles	14	(7)	7	6	86%
Milwakee	1		1	0	0
New Orleans	2	(1)	1	0	0

TABLE 3-1 (Continued)

U.S. Society* at	Total No. of Oil Analysts**	No. of Analysts Not Qualified***	Net	No. of Usable Responses	Percentage of Usable Responses
Nashville	0		0	0	0
New York	647	(69)	578	217	38%
North Carolina	0		0	0	0
Oklahoma City	2		2	1	50%
Omaha-Lincoln	4		4	2	50%
Philadelphia	18	(4)	14	5	36%
Phoenix	2	(1)	1	0	0
Pittsburgh	5	(1)	4	1	25%
Portland	0		0	0	0
Providence	1		1	0	0
Richmond	4		4	2	50%
Rochester	2		2	2	100%
St. Louis	6	(1)	5	3	60%
San Diego	2	(1)	1	1	100%
San Francisco	15	(2)	13	5	38%
Toledo	2		2	1	50%
Twin Cities (Minneapolis & St.Paul)	5	(1)	4	2	50%
Washington D.C.	10	(1)	9	7	78%
Wilmington	3	(1)	2	1	50%
Total	880	(110)	770	310	40%

TABLE 3-1 (Continued)

*All U.S. Societies of financial analysts, members of The Financial Analysts Federation (39 Societies).

**Source: 1974 Membership Directory of The Financial Analysts Federation; and a list of oil and gas security analyst, members of The New York Society of Security Analysts in December, 1974.

***Questionnaires returned without completion because analyst no longer follow securities of oil and gas producing companies, left his job, retired or deceased.

non-CFA), the type of the firm with which they were associated (national, regional, or local), their positions, and the period of their experience as analysts. Accordingly, the composition of the 310 responses was as follows:

1. in terms of the respondent's certification: 81 respondents were Certified Financial Analysts and 299 were not certified, and
2. in terms of the type of the firm: 162 respondents were associated with national firms, 92 with regional firms, 54 with local firms, and two did not indicate the type of their firms, and
3. in terms of the respondent's position: 43 respondents were partners, 48 were managers, 141 were analysts, 31 were in other positions, and 41 did not indicate their positions, and
4. in terms of the respondent's experience: 40 respondents had experience of five years or less, 77 had 6 to 10 years of experience, 156 had more than 10 years of experience, and 37 did not indicate the length of their experience. Thus, 233 (75%) of total responses were received from financial analysts who had more than five years of experience.

Important observations were obtained from Table 3-1 and the above tabulations. The first observation was that responses were received from members of all the societies having more than one oil and gas specialist. Second, the

percentages of responses from members of each of the societies having more than ten oil and gas specialists were within a narrow range (between 35% and 53%). The average percentage of these responses was 44% which is very close to the 40% overall response rate. Responses from New York Society, which have 75% of the total number of oil and gas security analysts, were 38% of the members of this society which is also very close to the overall rate of response. Such a distribution indicated that the responses can be considered fairly representing the U.S. societies of financial analysts in terms of geographic areas and size of membership. Thirdly, responses included a diversity of qualifications and levels of financial analysts which made the results of the questionnaire more meaningful. The responses came from both certified and non-certified financial analysts; from those who were working with national, regional, or local firms; from those who occupied different positions such as partners, managers, or analysts; and from those with different length of experience. But more important was the distribution of the responses among these variety of groups. Fourthly, the majority of responses were received from financial analysts with experience of more than ten years, and more than 75% were received from those with more than five-year experience. Based on these observations, it can be stated that the fair distribution and size of responses received from highly qualified and experienced oil and gas financial

analysts with homogeneity in nature contributed to a high reliability and success of the questionnaire conducted in this research. Therefore, it was assumed that the responses were representative of the population.

Although one should have confidence in the reliability of responses received from such skilled professionals as oil and gas financial analysts, it was decided to examine the consistency of the responses for the sake of strengthening such confidence. A reliability test of the questionnaire was made on a random sample of 30 responses (10% of the total). Responses were arranged as listed in the 1974 Directory of the Financial Analysts Federation. The sample was selected by using the first three digits from the left obtained from Kendall and Smith Tables of Random Sampling Numbers,[8] starting from the beginning of the First Thousand table. In order to select a sample size of 30 responses, repeated random numbers were replaced. The random number 128 was also replaced because respondent did not mark the questions selected for this examination.

Two tests were made on the sample selected. The first test was made to ascertain that the respondent read the questionnaire carefully before answering the questions. Question number 1 of the questionnaire instructed the respondent to skip question #3 (reasons for favoring "full cost" method with Yes or No response) if he favored "successful efforts" method. On the other hand, the question

also required skipping question #2 (reasons for favoring "successful efforts" method with Yes or No response) if the "full cost" method was favored. Obviously, reliability of the questionnaire was considered satisfactory if the respondent favored "successful efforts" method and did not respond to all parts of question #3, or if he favored "full cost" method and did not respond to all parts of question #2. The second test was made to examine the consistency of the sample responses. The last question (number 7) was the most appropriate one for that purpose. A response should be considered inconsistent if "successful efforts" method was favored under question #1 and a "uniform full cost" method was recommended under question #7; or if "full cost" method was favored under question #1 and a "uniform successful efforts" method was recommended under question #7. It was found that the results of the two tests made on the sample responses were satisfactory (see Appendix B, Exhibit 1).

With the knowledge of adequacy and reliability of the responses combined with the high quality of the respondents, it was possible to proceed confidently toward further steps in the analysis of the results in hand. Obviously, this was based on the assumption that the responses were representative of the population (oil and gas financial analysts).

Results of the Survey

Results of the survey will be summarized and discussed in the remaining part of this chapter under the following titles: assumptions, hypotheses, and results and discussion.

Assumptions

The empirical part of this research, concerning the opinions of the financial analysts toward the problem of the two methods of accounting for finding costs of oil and gas, began with some preliminary assumptions and expectations derived from studying relative literature on the subject matter. In particular, six major assumptions were relative to this research.

The first assumption was that the financial analysts are inclined to favor conservative financial reports for the purpose of their evaluation decisions and recommendations. This attitude was clearly expressed in the position paper on Reporting Practices in the Petroleum Industry submitted by the Financial Accounting Policy Committee of The Financial Analysts Federation to the American Institute of Certified Public Accountants on November 18, 1971:

> Our comments and suggestions are designed to further our twin objectives. First is our concern with conservatism in accounting. Given a choice we prefer understatement to overstatement.[9]

Thus, one would expect that financial analysts favor expensing the costs of unsuccessful activities rather than deferring

such costs to future periods. In other words, they would generally prefer the "successful efforts" method than the "full cost" method. Although some financial analysts favored the "full cost" method,[10] others claimed a more conservative "successful efforts" method:

> I do not see how any dry hole can be capitalized, regardless of where it is located. If it has no economic usefulness its value is zero and its cost is an ordinary operating expense.[11]

David Norr, a research partner at First Manhattan Co. (members of the New York Stock Exchange), who was displeased with the full-cost accounting, stated:

> In oil accounting one cannot convert from full costing results to successful effort. How can the market be efficient in such circumstances? How can resources be allocated efficiently if some companies capitalize dry holes.[12]

The significance of Mr. Norr's opinion stemmed from being known for his research in security analysis and he is a member of the American Institute of Certified Public Accountants as well.[13] In his recent speech before Houston Society of Financial Analysts, Norr called for the attention to the danger of full costing:

> There is no single footnote in the oil industry which will unravel the mysteries. Trouble can come in many forms. The greatest single problem surrounds the rise of full costing.[14]

After he described some of the full-cost pitfalls, he commented: "I submit that Full Costing has lost the war without even the opportunity to fight a battle."[15]

The second assumption was that the oil and gas financial analysts favor "cash flow" figure to net income reported

under either the "successful efforts" method or the "full cost" method. This may be a result of the wide differences in reporting net income under alternative methods of accounting for finding oil and gas. Undoubtedly, such differences would have a significant effect on comparability of reported net income even within the petroleum industry alone. In his comment in Forbes magazine, Randal B. McDonald, Partner of Arthur Andersen & Co., described the difficulty of comparing the annual reports of the oil companies. He stated: "I think I could piece it together, but the normal CPA and the normal financial analyst would not have a ghost of a chance."[16] In calculating the "cash flow" amounts for oil and gas companies, the cost of unsuccessful activities--i.e., dry holes and abandoned leases, etc.--are added back to reported net income. Such costs are not added back for "full cost" companies, except for an amount equal to depletion and amortization thereof, because they are not included among the charges against current revenue in the income statement.

The third assumption was derived from the "smoothing" effect of the "full cost" method. Obviously, when the unsuccessful costs of exploration and development are spread over a long period, annual profits are likely to have less fluctuation than if such costs are currently expensed.[17] Given a smoother periodic income, one would expect better projections of future net income if past net income is used as a basis for such projections. Consequently, the opinion of the financial

analysts should favor full cost accounting in terms of its predictive ability of net income per share; but that should not mean that the "full cost" method is preferred to the "successful efforts" method. Smoothing effect cannot stand by itself as a decisive criterion for favoring one method over another. A current expense, for example, may not be deferred only because such a deferral can smooth reported annual profits.

The fourth assumption was that the financial analysts recommend the disclosure of the items listed in the questionnaire under number (6). This is to express their need for more disclosure in the pu[redacted] reports. In its position paper on Acc[redacted] Practices in the Petroleum Industry, [redacted] Policy Committee of the Financial An[redacted]g on the necessity of more disclo[redacted]

> We believe that [redacted]ions should be attested to annua[redacted] consultant as part of the audit p[redacted]
>
> Further, we belie[redacted] should be segmented by field, basin, trend, country. This could be on more than one logical basis. The differing political and economic risks requires that this information be made available to the investor for intelligent decisions.
>
> We believe that the problem of income tax allocation ought to be included in any opinion issued by the Committee. A rationalization of oil and gas accounting would not be complete without it.[18]

In summary, this paper indicated that financial analysts needed more disclosure of information such as current expenditure on finding activities and how much was currently

analysts should favor full cost accounting in terms of its predictive ability of net income per share; but that should not mean that the "full cost" method is preferred to the "successful efforts" method. Smoothing effect cannot stand by itself as a decisive criterion for favoring one method over another. A current expense, for example, may not be deferred only because such a deferral can smooth reported annual profits.

The fourth assumption was that the financial analysts recommend the disclosure of the items listed in the questionnaire under number (6). This is to express their need for more disclosure in the published annual reports. In its position paper on Accounting and Reporting Practices in the Petroleum Industry, the Financial Accounting Policy Committee of the Financial Analysts Federation, focusing on the necessity of more disclosure, said:

> We believe that reserve data and valuations should be attested to annually by an independent consultant as part of the audit process.
>
> Further, we believe that data should be segmented by field, basin, trend, country. This could be on more than one logical basis. The differing political and economic risks requires that this information be made available to the investor for intelligent decisions.
>
> We believe that the problem of income tax allocation ought to be included in any opinion issued by the Committee. A rationalization of oil and gas accounting would not be complete without it.[18]

In summary, this paper indicated that financial analysts needed more disclosure of information such as current expenditure on finding activities and how much was currently

expensed, details of computing current depletion and amortization of capitalized amounts, value of recoverable reserves, and deferred income tax.

The fifth assumption was concerned with the uniformity aspect of published annual reports. It was assumed that financial analysts would be inclined to favor some sort of uniformity over flexibility with respect to accounting treatment of finding costs. David Norr stated that the need for greater uniformity and comparability has by now been impressed upon all.[19] Such uniformity of reporting could be accomplished through the use of a uniform method of accounting for finding costs, or by using a "uniform minimum disclosure" statement in which results should be reported under a uniform method as a minimum requirement.[20]

The sixth assumption was related to difference of opinion among the financial analysts classified by their certification, employment, position, or length of experience. Such difference of opinion was assumed to be insignificant. The financial analysts selected for this survey were specialized in oil and gas securities. For a group of financial analysts having their specialty in such securities, one can assume the homogeneity of the population surveyed. Such homogeneity may be explained by two reasons. Firstly, the population consisted of financial analysts having the same specialty. Secondly, the financial analysts are specialized in the securities of oil and gas industry which is a risky one.

Therefore, they are expected to have a minimum amount of knowledge of both the financial analysis and the oil and gas industry. This knowledge should be sufficient enough for dealing with such securities efficiently as specialists. Meanwhile, the questionnaire focused on basic information needs for financial analysis of oil and gas securities. Thus, opinions of those financial analysts on the questionnaire may not vary significantly.

These logical assumptions lead to the general and other hypotheses regarding the opinions of the financial analysts on the favorability of the two methods and the disclosure needs. These hypotheses will be indicated in the following section.

Hypotheses

Based on the above assumptions a number of null hypotheses were tested according to the results of the questionnaire sent to all the members of U.S. societies of financial analysts whose specialty was in oil and gas securities. The first seven hypotheses indicated below are concerned with the total data obtained from the questionnaire. The first and the second hypotheses were derived from the first assumption. The third, fourth, and fifth hypotheses were derived from the second, third, and fourth assumptions, respectively. The sixth and seventh hypotheses were derived from the fifth assumption. Other six hypotheses for the difference of opinion among respondents of different

classifications were derived from the sixth assumption. The above hypotheses are listed as follows:

A. General Null Hypotheses for Opinion of Oil and Gas Financial Analysts:

H_{01}: There is no significant difference between the proportion of responses favoring the "successful efforts" method and the proportion favoring the "full cost" method.

H_{02}: There is no significant difference between proportions of responses favoring and those not favoring the reasons listed in the questionnaire for preferring one of the two methods to the other.

H_{03}: When the annual reports of the oil companies are reported under either the "successful efforts" or the "full cost" method, there is no significant difference between proportions of responses preferring and those not preferring "cash flow" to reported net income.

H_{04}: When comparing between the "successful efforts" method and the "full cost" method in terms of their relative predictive ability of earnings per share and rate of return on total assets, there is no significant difference between proportions of responses favoring and those not favoring one of these methods over the other.

H_{05}: There is no significant difference between propor-

tions of responses which recommended the disclosure of each of the items listed in the third part of the questionnaire and those which considered the disclosure of these items unnecessary.

H_{06}: There is no significant difference between proportions of responses favoring and those disfavoring a uniform "successful efforts" method or a uniform "full cost" method.

H_{07}: There is no significant difference between proportions of responses favoring and those disfavoring "uniform minimum disclosure" statements under a uniform "successful efforts" method or "full cost" method.

B. Null Hypotheses for the Difference of Opinion among the Respondents' Classifications:

As previously indicated, responses were grouped according to different classifications of the respondents as to their certification (CFAs and non-CFAs), present employment, position, and experience. For each of these groups, opinions of respondents under different classifications were examined under the following hypotheses:

H_{01}: There is no significant difference of opinion among respondents of different classifications with respect to favoring the "successful efforts" method over the "full cost" method.

H_{02}: There is no significant difference of opinion among respondents of different classifications with respect to favoring the reasons listed in the questionnaire for preferring one of the two methods to the other.

H_{03}: There is no significant difference of opinion among respondents of different classifications with respect to favoring "cash flow" over reported net income under either "successful efforts" method or "full cost" method.

H_{04}: There is no significant difference of opinion among respondents of different classifications with respect to the relative ability of each of the two methods (successful efforts and full cost) in terms of predicting earnings per share and rate of return on total assets.

H_{05}: There is no significant difference of opinion among respondents of different classifications with respect to items recommended for disclosure to improve reporting of finding costs of oil and gas producing companies.

H_{06}: There is no significant difference of opinion among respondents of different classifications with respect to type of uniformity recommended for reporting finding costs of oil and gas producing companies.

Results and Discussion

The questionnaire results will be discussed according to the following sequence:

A. General Opinions of Respondents:

In this section, opinions of all the respondents will be summarized and discussed under the following titles:

I. Comparability of annual reports:

1. Opinions of respondents as to which method is more meaningful.
2. Reasons for favoring one of the two methods over the other.
3. Is "cash flow" more reliable than net income reported under either one of the two methods.

II. Opinions of respondents as to which method has relatively greater predictive ability.

III. Recommendations of respondents as to:

1. Disclosure.
2. Uniformity.

B. Difference of Opinion among Respondents:

After finding the opinions of the respondents as a whole, this section will be concerned with the question of whether there is a significant difference of opinion among respondents of different classifications.

It has been indicated that one cannot avoid some possible bias from generalizing the results of responses which are less than the entire population. However, the

quantity and quality of responses analyzed in this research lead to the judgment that useful results can be obtained from the questionnaire. Professor K. Fred Skousen at Brigham Young University used only 68 responses from management, financial analysts, and Certified Public Accountants. He concluded:

> . . . because of the limited number of responses, one cannot draw universal conclusions from this study, but the findings provide reliable indications of the realities surrounding the question. . . .[21]

The following results, therefore, were primarily based on the assumption that the responses were representative of the population of oil and gas analysts.

General Opinions of Respondents

Comparability of Annual Reports

Results of all responses to the first part of the questionnaire, on comparability of annual reports, will be summarized and discussed as follows:

Opinions of Respondents as to Which Method Is More Meaningful. Responses to question number 1 indicated that the respondents highly regarded the "successful efforts" method for providing more meaningful and relatively greater comparability of the annual reports of oil and gas producing companies than the "full cost" method. Responses favoring "successful efforts" method were 221 representing 73% of total responses to this question (304 after excluding 6 did not decide

which method is better). Only 83 or 27% of the respondents favored the "full cost" method of total responses. Chi-square was used to test the null hypothesis (H_{01}) that there was no significant difference between the two proportions. The null hypothesis was rejected because the difference was significant at 0.05 level of significance ($X^2 = 21.6$, d.f. = 1, $p > .05$). This indicated that the respondents favored "successful efforts" method over "full cost" method.

Reasons for Favoring One of the Two Methods over the Other. Respondents were requested to indicate the reasons for favoring one of the two methods over the other one. This was done by answering some questions commonly used in literature and in addition, a space was provided to all the respondent specify other reasons which he felt necessary to support his opinion (see a copy of the questionnaire in Appendix A, Exhibit 5). Table 3-2 summarizes the reasons given by respondents who favored the "successful efforts" method. This table shows that the respondents were highly impressed with two of the reasons provided in the questionnaire in support of the "successful efforts" method. In particular, reason number "c", that losses from unsuccessful ventures are currently reflected in the annual reports; and reason number (d) that "full cost" method inappropriately inflates current income. Percentages of the respondents who agreed upon those two reasons were 96% and 83%, respectively.[22] Respondents, however, were less impressed with the first two

TABLE 3-2

REASONS GIVEN BY RESPONDENTS FOR FAVORING "SUCCESSFUL EFFORTS" METHOD

Reason	No. of Responses		Percentage of		d.f.	X^2	Significant (S) Not Significant (NS)**
	Yes Responses	Total Responses	Total Responses	Responses Favoring This Method*			
a. It is consistent with traditional accounting	129	158	82%	58%	1	40.96	S
b. It improves matching of costs with related revenues	138	173	80%	62%	1	36.00	S
c. Losses from unsuccessful ventures are currently reflected in annual reports	195	203	96%	96%	1	84.64	S
d. Full-cost method inappropriately inflates current income	183	197	93%	83%	1	73.96	S

*Total responses favoring this method was 221.

**At 0.05 level of significance.

reasons provided in the questionnaire, concerning the consistency of this method with traditional accounting and its improving matching of costs with related revenues. Only 58% and 62% of respondents favoring this method, respectively, agreed upon those two reasons. The above percentages were calculated in terms of the total number of respondents who favored the successful efforts method. The decline in positive responses to those two reasons may be a result of having no standard procedures of successful efforts accounting. One of the respondents made it clear in that respect. He stated that he felt "neither method" is meaningful.

Chi-square was used to test the null hypothesis (H_{02}) that there are no significant differences between the proportions of responses favoring and those not favoring the four reasons listed in the questionnaire for preferring the "successful efforts" method to the "full cost" method. The Chi-square tests indicated significant differences between proportions of "Yes" and "No" responses at 0.05 level of significance (Table 3-2). Therefore, the null hypothesis (H_{02}) was rejected. The proportion of responses favoring the four reasons were higher than the proportion of responses disfavoring them as shown in Table 3-2. This indicated that the respondents favored those reasons for justifying their position.

A few other reasons were added on the questionnaire by some respondents.[23] One of these reasons was that the

financial statements prepared under the "successful efforts" method reflects current operations better than those statements prepared under the "full cost" method. Examples of the statements given by the respondents in this respect were: "It (successful efforts method) is a truer reflection of the year's operations," "I prefer the 'successful efforts' method because it currently states what has happened when it happened," the "successful efforts" method "Alerts stockholders to overextension of company exploration programs," and "It (full cost) inflates current income and frequently results in substantial write-offs as reserves values become lower than their booked cost." Conservatism of the "successful efforts" method was felt by some respondents to be desirable. Others were displeased with capitalizing dry holes. Examples of their statements were as follows: "full cost put non-asset (dry holes) on balance sheet," "In no way is a dry hole an asset," "It (full cost) presents a valueless project as asset," and "It is foolish to capitalize an isolated expenditure that cannot possibly provide a future return." These statements did not identify the dry holes to productive or unproductive properties. However, dry holes of unproductive properties was felt to be what the respondents wanted to state on the questionnaire. The other comments indicated by the respondents were general statements against the "full cost" method. Examples of those statements were as follows: "full cost conceals poor (unsuccessful)

management," "There is less opportunity for abuse under successful efforts," and "full cost accounting is unrealistic and financially unsound."

Table 3-3 shows the reasons given by respondents who favored the "full cost" method. Responses favoring this method, as previously indicated, represented only 27% of total responses.

Most of those who favored the "full cost" method (90% of total responses favoring this method) believed that it improves matching of costs with related revenues because discoveries are unlikely without incurrence of unsuccessful ventures (reason #b). Another reason which was less applaudable by this group of respondents (agreed upon by only 70% of total responses favoring this method) was that results under this method are not depressed by exploratory costs which are not related to current revenues (reason #a). Other reasons, such as that "full cost" method permits ready comparison of commulative and current results of exploration programs (reason #c), that balance sheet under this method reflects actual costs of mineral reserves (reason #d), and that the "full cost" method encourages exploration (reason #e): were not applaudable by respondents as the first two reasons were. Positive responses to those reasons were only 47%, 58%, and 40% of total responses favoring "full cost" method, respectively. This is explained by the low response to these questions. When Chi-square tests were

TABLE 3-3

RESPONDENTS' REASONS FOR FAVORING "FULL COST" METHOD

Reason	No. of Responses		Percentage of		d.f.	X^2	Significant (S) Not Significant (NS)**
	Yes Responses	Total Responses	Total Responses	Responses Favoring This Method*			
a. Results are not depressed by exploratory costs which are not related to current revenues.	59	66	89%	71%	1	60.84	S
b. It improves matching of costs with related revenues because discoveries are unlikely without incurrence of unsuccessful ventures.	75	80	94%	90%	1	77.44	S
c. When presented with changes of reservoirs, it permits ready comparison of cumulative and current results of exploration programs.	39	52	75%	47%	1	25.00	S
d. Balance sheet reflects actual costs of mineral revenues.	48	64	75%	58%	1	25.00	S
e. It encourages exploration and development of reservoirs.	33	59	56%	40%	1	10.24	S

*Total responses favoring this method was 83.
**At 0.05 level of significance.

applied to the proportions of "Yes" and "No" responses to reasons from (a) through (e) included in the questionnaire (89%, 94%, 75%, 75%, and 59% were "Yes" answers, respectively), it was found that differences were significant at 0.05 level of significance (Table 3-3). Nevertheless, it should be noticed that the "Yes" responses to reasons numbers (c) and (e) did not reach the majority of the responses favoring "full cost" method. It was considered, therefore, that these two reasons were not accepted by respondents favoring "full cost" method.

Some reasons were added by respondents in the space provided for "other" reasons for favoring the "full cost" method over the "successful efforts" method.[24] Examples of those reasons were: "It (full cost) prevents manipulation of earnings by manipulation of the exploration budget," "Earnings contains fewer anomalies," "Our customers feel more comfortable with this method," and "Costs related to attempts to expand asset value are clearly stated."

Is "Cash Flow" More Reliable than Net Income Reported under Either One of the Two Methods. The previous questions were concerned with a relative comparison between the "successful efforts" method and the "full cost" method. Because of the variety of accounting treatments of finding costs, question number 4 was designed to show the financial analysts opinion as to whether they considered "cash flow" (cash flow from operations) more reliable for comparability

and predictions than reported net income under each of the two methods. Responses to this question are shown in Table 3-4.

Apparently, responses to this question indicated that the "cash flow" amount is highly regarded by the respondents. Table 3-4 shows that the respondents considered "cash flow" more reliable than net income reported under "successful efforts" method or the "full cost" method for the purpose of comparability and predictions. The table shows also that the majority of respondents favoring the "successful efforts" method preferred "cash flow" figures to net income reported under this method. However, "cash flow" was favored in the case of "successful efforts" accounting more than it was favored in the case of "full cost" accounting. It was favored by 73% and 65% of total respondents in the two cases, respectively. This can be explained by two reasons. Firstly, adding back expenses which did not require the outlay of funds may reduce the fluctuation of net income reported under the "successful efforts" method. Secondly, some items such as deferred costs of unsuccessful ventures may be added back to net income reported under "successful efforts" method only. Thus, resulting "cash flow" amount may be relatively smoother than the amount calculated under "full cost" method.

It is clear from the Chi-square tests that the respondents favor "cash flow" for comparability and

TABLE 3-4

RESPONDENTS' OPINION AS TO WHETHER "CASH FLOW" (CF) IS MORE RELIABLE THAN REPORTED NET INCOME

CF Is More Reliable Than	Yes Responses	No Responses	Total	d.f.	X^2	Significant (S) Not Significant (NS)*
a. Net income reported under SE:						
Responses favoring SE	132	41	173			
Responses favoring FC	30	20	50			
Total responses	162	61	223			
Percentage	73%	27%	100%	1	21.15	S
b. Net income reported under FC:						
Responses favoring SE	87	51	138			
Responses favoring FC	43	19	62			
Total responses	130	70	200			
Percentage	65%	35%	100%	1	9.00	S

*At 0.5 level of significance.

predictions over reported net income under either "successful efforts" method or "full cost" method. Therefore, the null hypothesis (H_{03}) was rejected.

Opinion of Respondents as to Which Method has Relatively Greater Predictive Ability

The opinion of oil and gas financial analysts concerning the relative predictive ability of each of the two methods represented an important part of the questionnaire. The focus on the predictive ability was in terms of three items: earnings per share, rate of return on total assets, and returns to investors (dividends plus appreciation of stock). The third item was excluded from this research because other studies were made on the relationship between the two methods and market prices of oil and gas securities.[25]

Results of the survey with respect to the predictive ability of the two methods are shown in Table 3-5. These results indicated the following:

1. The majority of the respondents (59%) felt that the "full cost" method is better in predicting earnings per share. But in terms of predicting the rate of return on total assets, the majority of the respondents (57%) felt that the "successful efforts" method is better.
2. The statistical analysis, on the other hand, indicated the following:
   a. At 0.05 level of significance, differences between

TABLE 3-5

RESPONDENTS' OPINION ON RELATIVE PREDICTIVE ABILITY OF THE TWO METHODS

Predictive Ability Is Better in Terms Of	Under SE	Under FC	Total	d.f.	X^2	Significant (S) Not Significant (NS)*
a. Earnings per Share:						
Respondents favoring SE	111	90	201			
Respondents favoring FC	5	75	80			
Total	116	165	281			
Percentage	41%	59%	100%	1	3.24	NS**
b. Rate of Return on Total Assets:						
Respondents favoring SE	149	54	203			
Respondents favoring FC	9	67	76			
Total	158	121	279			
Percentage	57%	43%	100%	1	1.96	NS

*At 0.05 level of significance.

**Significant at 0.10 level of significance.

"Yes" and "No" response proportions were not significant for both questions on predicting earnings per share and rate of return on total assets. This indicated, statistically, that the respondents' opinions did not favor one of the two methods over the other in these respects. Thus, the null hypothesis (H_{04}) cannot be rejected.

b. At 0.10 level of significance, such differences were significant in terms of earnings per share, but they were insignificant in terms of rate of return on total assets. This indicated, statistically at this level of significance, that the respondents favored the "full cost" method in terms of predicting earnings per share, but they did not favor one of the two methods over the other in terms of predicting rate of return on total assets. Thus, the null hypothesis (H_{04}) should be rejected in terms of predicting earnings per share and accepted in terms of rate of return on total assets.

The above analysis indicated that the strong support, given in the other parts of the questionnaire to one of the two methods, did not hold for the questions on the predictive ability. Ninety respondents who favored "successful efforts" method (in question #1) indicated that "full cost" method provided better predictions of earnings per share (Table 3-5). This number represented 45% of

successful-efforts proponents who responded to this question (201 respondents). Therefore, an important observation was obtained from these responses. In spite of such recognition of the predictive power of the "full cost" method, a great majority of the total respondents, as previously indicated, still favor the "successful efforts" method. One of the respondents,[26] the Vice President of a financial corporation, explained this fact clearly:

> While the full cost method can be more reliable for predicting reported earnings on an annual basis for smaller companies, it leads, I believe, to many abuses that more than offset its advantages.[27]

Another respondent, the Chairman of the Executive and Financial Committee of a regional firm, stated: "The 'full cost' method has more 'predictability.' In other words, it can be more easily manipulated."[28] Thus, although financial analysts recognized the relative predictive power of the "full cost" method in terms of earnings per share (only), a high majority still favor the "successful efforts" method. A logical explanation to this result is that, in the opinion of oil and gas financial analysts, the disadvantages of the "full cost" method offset its advantages. In terms of the predictive ability of the rate of return on total assets, the results were opposite to the hypothesis. However, the difference between those who favored the "successful efforts" method in this respect and those who favored the "full cost" method was insignificant.

Recommendations of Respondents

Disclosure. Table 3-6 shows the results of the disclosure recommendation of the respondents. It shows the results in terms of how many recommended or did not recommend the item indicated in the questionnaire to be disclosed in published financial statements. The results of the Chi-square tests are also shown in the table. The Chi-square was used, as previously mentioned, to test the hypothesis that there is no significant difference between the proportion of respondents who recommended each item and the proportion which did not recommend that item. The results of Chi-square tests were all significant at 0.05 level of significance (Table 3-6). Therefore, the null hypothesis (H_{05}) was rejected. All the items, except one, were recommended by the majority of the responses. The exception was the disclosure of the value of reservoirs at future net revenues without discount.

The following items were recommended for disclosure by more than 90% of respondents:

1. Current expenditures of finding activities (90%).
2. Amount currently expensed for unsuccessful ventures (98%).
3. Details of computing current amortization of capitalized finding costs (92%).
4. Deferred income tax for differences between book and tax treatment of finding costs (91%).

TABLE 3-6

RESPONDENTS' RECOMMENDATIONS ON DISCLOSURE

Item	Recommend	Do Not Recommend	Total	d.f.	X^2	Significant (S) Not Significant (NS)*
a. Current expenditures of finding activities.	301	2	303			
Percentage	99%	1%	100%	1	96.0	S
b. Amount currently expended for costs of unsuccessful ventures.	293	5	298			
Percentage	98%	2%	100%	1	92.16	S
c. Details of computing current amortization of capitalized finding costs.	255	23	278			
Percentage	92%	8%	100%	1	70.56	S
d. Value of recoverable reserves at:						
1. Fair market value.	183	62	245			
Percentage	75%	25%	100%	1	25.00	S
2. Future net revenues discounted.	167	74	241			
Percentage	69%	31%	100%	1	14.44	S
3. Future net revenues without discount.	90	124	214			
Percentage.	42%	58%	100%	1	5.76	S
e. Value of recoverable reserves, country-by-country.	172	36	208			
Percentage	83%	17%	100%	1	43.56	S
f. Deferred income tax	256	24	280			
Percentage	91%	9%	100%	1	67.24	S

*At 0.05 level of significance.

Other items, except the value of recoverable reserves at future net revenues without discount which was rejected, were recommended by at least 69% of the respondents.

Uniformity. It was found that the respondents highly recommended uniformity for reporting finding costs of oil and gas. Table 3-7 shows a summary of the questionnaire results with respect to uniformity recommendations given by the respondents to the questionnaire.

The questionnaire results indicated that a uniform "successful efforts" method was strongly recommended by the majority of respondents. This was obviously seen by comparing 205 responses recommending a uniform "successful efforts" method, whereas only 91 respondents recommended a uniform "full cost" method. In terms of proportions, 85% of total responses (238) recommended a uniform "successful efforts" method and only 14% answered that this uniformity is not necessary. With respect to a uniform "full cost" method, 51% of total responses (185) answered that it is not necessary and 49% recommended reporting under this method. Chi-square tests, at 0.05 level of significance, indicated a significant difference in the case of recommending a uniform "successful efforts" method and an insignificant difference in the case of recommending a uniform "full cost" method. Therefore, the null hypothesis (H_{06}) was rejected for the first recommendation and accepted for the second. However, a lower response was observed with respect to the latter

TABLE 3-7

RESPONDENTS' RECOMMENDATIONS ON UNIFORMITY OF REPORTING FINDING COSTS

Type of Uniformity	Recommend	Do Not Recommend	Total	d.f.	X^2	Significant (S) Not Significant (NS)*
a. Uniform SE	205	33	238			
Percentage	86%	14%	100%	1	51.84	S
b. Uniform FC	91	94	185			
Percentage	49%	51%	100%	1	0.04	NS
c. Uniform minimum disclosure statement under standard SE	145	40	185			
Percentage	78%	22%	100%	1	31.36	S
d. Uniform minimum disclosure statement under standard FC	96	75	171			
Percentage	56%	44%	100%	1	10.24	S

*At 0.05 level of significance.

recommendation (185 responses compared with 238 responses to the uniform "successful efforts" method). Therefore, it was considered that a uniform "full cost" method is rejected. This is true because 51% of the respondents considered that such a uniform method is not necessary.

A "uniform minimum disclosure" statement was recommended under a standard "successful efforts" method by 145 respondents, and under a standard "full cost" method by 96 respondents. In terms of proportions, 78% of respondents favored the first method and 56% recommended the second. Chi-square tests, at 0.05 level of significance, indicated significant differences between proportions favoring and disfavoring the above two recommendations. Therefore, it was concluded that the respondents favored both presentations. However, by comparing the number and percentages of responses recommending such disclosure, it was clear that "uniform minimum disclosure" statement under a standard "successful efforts" method received a greater acceptance by the respondents. Chi-square test confirmed this finding. The difference between proportions of respondents favoring both presentations was found significant, at 0.05 level of significance ($X^2 = 16.4$, d.f. = 1, $p > .05$).

Finally, very few recommendations were added on the questionnaire by the respondents. One respondent suggested the disclosure of reservoirs in volume rather than in value. Another recommended a uniform footnote to restate results

under the method not used by the reporting company for finding costs. Other comments were made to express the need for more disclosure in general, without indicating specific items other than those listed in the questionnaire.

Difference of Opinion among Respondents

The general results of the survey summarized in the previous section indicated the opinions of all the respondents as to the questions listed in the questionnaire. The analysis of variance technique, as previously indicated, was used to determine whether there was a significant difference of opinion among respondents of different classifications (Tables 3-8 through 3-15). For this purpose, respondents were classified by their certification, employment, position, or length of experience. Results of the analysis were tabulated for each of these classifications under two parts as follows:

I. Analysis of variance of opinions as to questions of comparability and predictive ability of the two methods when respondents were classified as:
   a. certified or non-certified financial analysts (Table 3-8).
   b. financial analysts working for national, regional, or local firms (Table 3-9).
   c. partners, managers, analysts, or other positions (Table 3-10).
   d. financial analysts having 0-5 years, 6-10 years, or

TABLE 3-8

ANALYSIS OF VARIANCE: OPINION ON COMPARABILITY AND RELATIVE PREDICTIVE ABILITY RESPONDENTS CLASSIFIED AS CERTIFIED (CFA) OR NON-CERTIFIED (NCFA) FINANCIAL ANALYSTS

Question	Mean CFA	Mean NFCA	d.f.	F Ratio	Significant (S) Not Significant (NS)*
I. Comparability of Annual Reports					
1. Which method (SE or FC) is more meaningful.	1.24	1.28	1&302	0.46	NS
2. Reasons for favoring SE are:					
a. Consistency with traditional accounting.	1.19	1.18	1&156	0.02	NS
b. Improving matching of costs with revenues.	1.17	1.22	1&171	0.52	NS
c. Currently reflects losses from unsuccessful ventures.	1.04	1.04	1&201	0.02	NS
d. FC inappropriately infaltes reported income.	1.06	1.08	1&195	0.23	NS
3. Reasons for favoring FC are:					
a. Results are not depressed by exploratory costs	1.06	1.12	1& 64	0.23	NS
b. Improving matching costs with revenues.	1.11	1.05	1& 78	0.92	NS
c. Permitting ready comparison of cumulative and current results of exploration programs.	1.46	1.20	1& 50	3.18	NS
d. Balance sheet reflects actual costs of reservoirs.	1.27	1.25	1& 62	0.03	NS
e. Encouraging exploration.	1.29	1.49	1& 57	1.78	NS
4. "Cash flow" is more reliable for comparability and predictions than:					
a. Net income reported under SE	1.26	1.28	1&221	0.07	NS
b. Net income reported under FC	1.37	1.34	1&198	0.89	NS
II. Relative Predictive Ability					
5. Which method is more reliable for predicting:					
a. Earning per share.	1.61	1.58	1&279	0.13	NS
b. Rate of return on total assets	1.39	1.45	1&277	0.79	NS

TABLE 3-9

ANALYSIS OF VARIANCE: OPINION ON COMPARABILITY AND PREDICTIVE ABILITY
RESPONDENTS CLASSIFIED BY PRESENT EMPLOYMENT

Question	Mean EAs Working For: National Firm	Regional Firm	Local Firm	d.f.	F Ratio	Significant (S) Not Significant (NS)
I. Comparability of Annual Reports						
1. Which method (SE or FC) is more meaningful	1.42	1.32	1.28	2&301	0.94	NS
2. Reasons for favoring SE are:						
a. Consistency with traditional accounting.	1.21	1.20	1.07	2&155	1.31	NS
b. Improving matching of costs with revenues	1.24	1.19	1.12	2&170	1.02	NS
c. Currently reflects losses from unsuccessful ventures.	1.04	1.03	1.05	2&200	0.13	NS
d. FC inappropriately infaltes income.	1.05	1.09	1.12	2&194	1.36	NS
3. Reasons for favoring FC are:						
a. Results are not depressed by exploratory costs.	1.10	1.14	1.07	2& 63	0.19	NS
b. Improving matching of costs with revenues.	1.05	1.07	1.07	2& 77	0.04	NS
c. Permitting ready comparison of cumulative and current results of exploration programs.	1.35	1.06	1.31	2& 49	2.27	NS
d. Balance sheet reflects actual costs of reservoirs.	1.24	1.19	1.36	2& 61	0.62	NS
e. Encouraging exploration.	1.54	1.24	1.50	2& 56	2.11	NS
4. "Cash flow" is more reliable for comparabilities and prediction than:						
a. Net income reported under SE	1.32	1.94	1.62	2&220	1.64	NS
b. Net income reported under FC	1.32	1.41	1.33	2&197	0.59	NS
II. Relative Predictive Ability						
5. Which method is more reliable for predicting:						
a. Earnings per share.	1.57	1.61	1.61	2&278	0.22	NS
b. Rate of return on total assets.	1.41	1.47	1.43	2&276	0.33	NS

TABLE 3-10

ANALYSIS OF VARIANCE: OPINION ON COMPARABILITY AND PREDICTIVE ABILITY
RESPONDENTS CLASSIFIED BY POSITION

Question	Means				d.f.	F Ratio	Significant (S) Not Significant (NS)
	Partners	Managers	Analysts	Other			
I. Comparability of Annual Reports							
1. Which method (SE or FC) is more meaningful.	1.32	1.23	1.26	1.27	3&300	0.47	NS
2. Reasons for favoring SE are:							
a. Consistency with traditional accounting.	1.16	1.20	1.18	1.22	3&154	0.13	NS
b. Improving matching of costs with revenues.	1.26	1.07	1.32	1.17	3&169	1.59	NS
c. Currently reflects losses from unsuccessful ventures.	1.02	1.06	1.05	1.00	3&199	0.77	NS
d. FC inappropriately inflates reported income.	1.08	1.09	1.07	1.00	3&193	0.61	NS
3. Reasons for favoring FC are:							
a. Results are not depressed by exploratory costs.	1.13	1.10	1.10	1.00	3& 62	0.20	NS
b. Improving matching costs with revenues.	1.11	1.09	1.03	1.00	3& 76	0.79	NS
c. Permitting ready comparison of cumulative and current results of exploration programs.	1.22	1.14	1.29	1.33	3& 48	0.26	NS

TABLE 3-10 (Continued)

Question	Means				d.f.	F Ratio	Significant (S) Not Significant
	Partners	Managers	Analysts	Other			
d. Balance sheet reflects actual costs of reservoirs.	1.21	1.10	1.39	1.00	3& 60	1.79	NS
e. Encouraging exploration.	1.47	1.40	1.43	1.50	3& 55	0.06	NS
4. "Cash flow" is more reliable for comparability and predictions than:							
a. Net income reported under SE	1.27	1.23	1.32	1.17	3&219	0.91	NS
b. Net income reported under FC	1.41	1.38	1.29	1.44	3&196	0.97	NS
II. Relative Predictive Ability							
5. Which method is more reliable for predicting:							
a. Earnings per share.	1.65	1.49	1.59	1.57	3&277	1.04	NS
b. Rate of return on total	1.51	1.46	1.38	1.43	3&275	1.23	NS

TABLE 3-11
ANALYSIS OF VARIANCE: OPINION ON COMPARABILITY AND PREDICTIVE ABILITY
RESPONDENTS CLASSIFIED BY EXPERIENCE

Question	Mean-FAs with Experience			d.f.	F Ratio	Significant (S) Not Significant (NS)
	0-5 Years	6-10 Years	Over 10 Years			
I. Comparability of Annual Reports:						
1. Which method (SE or FC) is more meaningful.	1.25	1.27	1.29	2&301	0.21	NS
2. Reasons for favoring SE are:						
a. Consistency with traditional accounting.	1.29	1.16	1.14	2&155	2.02	NS
b. Improving matching of costs with revenues.	1.91	1.29	1.17	2&170	1.25	NS
c. Currently reflects losses from unsuccessful ventures.	1.04	1.04	1.04	2&200	0.00	NS
d. FC inappropriately inflates reported income.	1.16	1.06	1.03	2&194	4.15	S
3. Reasons for favoring FC are:						
a. Results are not depressed by exploratory costs.	1.00	1.11	1.15	2& 63	1.18	NS
b. Improving matching costs with revenues.	1.00	1.14	1.05	2& 77	1.84	NS
c. Permitting ready comparison of cumulative and current results of exploration programs.	1.33	1.31	1.19	2& 49	0.61	NS
d. Balance sheet reflects actual costs of reservoirs.	1.25	1.28	1.26	2& 61	0.01	NS
e. Encouraging exploration.	1.33	1.50	1.44	2& 56	0.31	NS

TABLE 3-11 (Continued)

Question	Mean-FAs with Experience			d.f.	F Ratio	Significant (S) Not Significant (NS)
	0-5 Years	6-10 Years	Over 10 Years			
4. "Cash flow" is more reliable for comparability and predictions than						
a. Net income reported under SE	1.28	1.35	1.23	2&220	1.32	NS
b. Net income reported under FC	1.37	1.29	1.38	2&197	0.58	NS
II. Relative Predictive Ability						
5. Which method is more reliable for predicting						
a. Earnings per share.	1.59	1.60	1.58	2&278	0.07	NS
b. Rate of return of total assets.	1.39	1.48	1.44	2&276	0.62	NS

TABLE 3-12

ANALYSIS OF VARIANCE: RECOMMENDATIONS OF CERTIFIED (CFA) AND NON-CERTIFIED FINANCIAL ANALYSTS (NCFA)

Recommendation	Mean		d.f.	F Ratio	Significant (S) Not Significant (NS)
	CFA	NCFA			
I. Disclosure Of:					
a. Current expenditures on finding activities.	1.19	1.26	1&301	1.27	NS
b. Amount currently expensed for costs of unsuccessful ventures.	1.30	1.31	1&301	0.03	NS
c. Details of computing current amortization of capitalized finding costs.	1.70	1.69	1&291	0.00	NS
d. Value of recoverable reserves based on:					
1. Fair market value.	2.11	2.47	1&263	3.29	NS
2. Future net revenues discounted.	2.30	2.57	1&274	1.78	NS
3. Future net revenues without discount.	3.14	3.35	1&254	0.92	NS
e. Value of recoverable reserves on a country-by-country basis.	1.92	2.11	1&216	1.02	NS
f. Deferred income tax.	1.69	1.84	1&294	1.33	NS
II. Uniformity:					
a. Uniform SE method.	1.66	1.89	1&252	1.78	NS
b. Uniform FC method.	3.29	3.02	1&204	1.09	NS
c. Uniform minimum disclosure statement with standard SE.	2.06	2.35	1&215	1.96	NS
d. Uniform minimum disclosure statement with standard FC.	2.83	2.89	1&202	0.05	NS

TABLE 3-13

ANALYSIS OF VARIANCE: RECOMMENDATIONS OF FINANCIAL ANALYSTS (FAs) WORKING FOR NATIONAL, REGIONAL, AND LOCAL FIRMS

Recommendation	Mean-FAs Working For: National Firm	Regional Firm	Local Firm	d.f.	F Ratio	Significant (S) Not Significant (NS)
I. Disclosure Of:						
a. Current expenditures on finding activities.	1.22	1.27	1.26	2&300	0.30	NS
b. Amount currently expensed for costs of unsuccessful ventures.	1.24	1.44	1.31	2&300	2.84	NS
c. Details of computing current amortization of capitalized finding costs.	1.68	1.78	1.60	2&290	0.58	NS
d. Value of recoverable reserves based on:						
1. Fair market value.	2.47	2.29	2.28	2&262	0.60	NS
2. Future net revenues discounted.	2.53	2.37	2.61	2&273	0.52	NS
3. Future net revenues without discount.	3.28	3.30	3.35	2&253	0.04	NS
e. Value of recoverable reserves on a country-by-country basis.	2.06	2.16	1.94	2&215	0.38	NS
f. Deferred income tax.	1.72	1.84	2.00	2&293	1.59	NS
II. Uniformity						
a. Uniform SE method.	1.72	2.01	1.88	2&251	1.35	NS
b. Uniform FC method.	3.09	2.93	3.29	2&203	0.61	NS
c. Uniform minimum disclosure statement with standard SE.	2.28	2.05	2.57	2&214	1.78	NS
d. Uniform minimum disclosure statement with standard FC.	2.90	2.58	3.28	2&201	2.68	NS

TABLE 3-14

ANALYSIS OF VARIANCE: RECOMMENDATIONS OF PARTNERS, MANAGERS, ANALYSTS, AND OTHER FINANCIAL ANALYSTS (FAs)

Recommendation	Means				d.f.	F Ratio	Significant (S) Not Significant (NS)
	Partners	Managers	Analysts	Other			
I. Disclosure Of:							
a. Current expenditures on finding activities.	1.29	1.31	1.14	1.43	3&299	3.97	S
b. Amount currently expensed for costs of unsuccessful ventures.	1.40	1.35	1.19	1.55	3&299	3.81	S
c. Details of computing current amortization of capitalized finding costs.	1.80	1.60	1.60	2.00	3&289	1.74	NS
d. Value of recoverable reserves based on:							
1. Fair market value.	2.61	2.24	2.29	2.52	3&261	1.11	NS
2. Future net revenues discounted.	2.56	2.38	2.48	2.58	3&272	0.17	NS
3. Future net revenues without discount.	3.23	3.25	3.33	3.44	3&252	0.17	NS
e. Value of recoverable reserves on a country-by-country basis.	2.00	2.22	2.02	2.13	3&214	0.27	NS
f. Deferred income tax.	2.05	1.63	1.64	2.14	3&292	4.48	S
II. Uniformity:							
a. Uniform SE method.	2.06	1.86	1.71	1.69	3&250	1.27	NS
b. Uniform FC method.	2.83	3.30	3.17	2.95	3&202	0.84	NS
c. Uniform minimum disclosure statement with standard SE.	2.47	2.15	2.22	2.25	3&213	0.56	NS
d. Uniform minimum disclosure statement with standard FC.	2.91	2.82	2.86	3.00	3&200	0.07	NS

TABLE 3-15

ANALYSIS OF VARIANCE: RECOMMENDATIONS OF FINANCIAL ANALYSTS (FAs) WITH DIFFERENT PERIODS OF EXPERIENCE

Recommendation	Mean-FAs with Experience			d.f.	F Ratio	Significant (S) Not Significant (NS)
	0-5 Years	6-10 Years	Over 10 Years			
I. Disclosure Of:						
a. Current expenditures on finding activities.	1.33	1.24	1.20	2&300	1.77	NS
b. Amount currently expensed for costs of unsuccessful efforts.	1.46	1.28	1.25	2&300	2.89	NS
c. Details of computing current amortization of capitalized finding costs.	1.89	1.62	1.64	2&290	1.97	NS
d. Value of recoverable reserves based on:						
1. Fair market value.	2.86	2.24	2.22	2&262	5.57	S
2. Future net revenues discounted.	2.90	2.21	2.42	2&273	4.44	S
3. Future net revenues without discount.	3.69	3.20	3.13	2&253	3.44	S
e. Value of recoverable reserves on a country-by-country basis.	2.41	1.90	1.97	2&215	2.70	NS
f. Deferred income tax.	1.92	1.70	1.79	2&293	0.84	NS
II. Uniformity:						
a. Uniform SE method.	1.77	2.03	1.76	2&251	1.13	NS
b. Uniform FC method.	3.29	3.12	2.96	2&203	0.75	NS
c. Uniform minimum disclosure statement with standard SE.	2.29	2.42	2.19	2&214	0.58	NS
d. Uniform minimum disclosure statement with standard FC.	3.04	2.74	2.88	2&201	0.54	NS

over 10 years experience (Table 3-11).

II. Analysis of variance of recommendations for disclosure and uniformity of reporting when respondents were classified as:

a. certified or non-certified financial analysts (Table 3-12).

b. financial analysts working for national, regional, or local firms (Table 3-13).

c. partners, managers, analysts, or other positions (Table 3-14).

d. financial analysts having 0-5 years, 6-10 years, or over 10 years experience (Table 3-15).

The above tables indicated that there is no significant difference of opinion among respondents of different classifications, at 0.05 level of significance, with respect to all the items listed in the questionnaire with a few exceptions. This requires that the null hypotheses (H_{01} through H_{06}) for the difference of opinion among respondents' classifications cannot be rejected except in the following cases where such differences were significant:

1. Reason #d, supporting the "successful efforts" method that the "full cost" method inappropriately inflates reported income (Table 3-11).
2. Difference of opinion among partners, managers, analysts, and others (Table 3-14) with respect to disclosure of:
   a. current expenditures on finding activities.

b. amount currently expensed for costs of unsuccessful ventures.

c. deferred income tax.

3. Difference of opinion among respondents having different periods of experience with respect to disclosure of the value of recoverable reserves (Table 3-15).

Although all the groups highly favored reason No. "d" (listed under #1 above) for supporting the "successful efforts" method, respondents with 0-5 years experience were less enthusiastic than the others. The difference of opinion between respondents with short experience and those with long experience was explained by one of the respondents. He stated:

> Earlier in my analytical career, I strongly supported full cost accounting, but as I have gained more experience with its effects on income statements and balance sheet, I have changed my position and now believe that a successful efforts approach is the desirable one.[30]

Other differences listed above resulted also from the difference of opinion between analysts and managers or partners, or between analysts with 0-5 years experience and those with longer experience. For example, partners and managers were less enthusiastic than analysts with respect to disclosure of the items listed under #2 above (see Table 3-14). On the other hand, analysts with 0-5 years experience were less enthusiastic than analysts with longer experience with respect to disclosure of the value of recoverable reserves (see Table 3-15).

Such difference of opinion did not indicate any disagreement with the general opinions of the respondents. Opinions of the respondents under all classifications were in line with the overall opinions indicated under the General Opinions of Respondents (Part A above).

Summary

A mail questionnaire was used in this research to obtain the opinion of oil and gas financial analysts as to the evaluation of the two methods of accounting for finding costs in the oil and gas industry, the "successful efforts" method and the "full cost" method. The questionnaire was divided into three parts. The first and the second parts were designed to evaluate the two methods in terms of their relative comparability and predictive ability. The third part included recommendations to improve reporting of finding costs.

The population consisted of 770 oil and gas financial analysts (members of all the U.S. societies of financial analysts in 1974). Usable responses were received from 310 analysts representing 40.3% of the population. They were received from members of all the societies having more than one oil and gas financial analyst. Respondents represented a diversity of classifications such as certified and non-certified financial analysts; those who were working for national, regional, and local firms; partners, managers, analysts, and others; those with short period of experience

such as 0-5 years, and those with longer periods of experience such as 6-10 years or more than 10 years.

The following important results were obtained from the survey:

1. The respondents highly favored "successful efforts" method over "full cost" method for providing more meaningful and yielding relatively greater comparability of annual reports of oil and gas producing companies.
2. Reasons which received largest acceptance among respondents for favoring the "successful efforts" method were:
   a. Losses from unsuccessful ventures are currently reflected in the annual reports.
   b. "Full cost" method inappropriately inflates current income.
   c. It is consistent with traditional accounting.
   d. It improves matching costs with related revenues.
3. Reasons which received largest acceptance among respondents for favoring the "full cost" method were:
   a. It improves matching of costs with related revenues because discoveries are unlikely without incurrence of unsuccessful ventures.
   b. Results under this method are not depressed by exploratory costs which are not related to current revenues.
   c. The balance sheet under this method reflects actual costs of mineral reserves.

Acceptance of two reasons for supporting "full cost" method did not reach 50% of 83 respondents (or 27% of all respondents) favoring this method. The two reasons are: "full cost" method encourages exploration and development of reservoirs, and it permits ready comparison of cumulative and current results of exploration programs.

4. Support given by respondents to both methods was not sufficient enough to statistically favor one method over another in terms of predicting earning per share and rate of return on total assets. In terms of predicting earnings per share, 59% of responses favored "full cost" method and 41% favored "successful efforts" method. The difference between these proportions are not significant at 0.05 level of significance. In terms of predicting rate of return on total assets, 57% of responses favored "successful efforts" method and 43% favored "full cost" method. This difference again was not significant at 0.05 level of significance.
5. Respondents recommended disclosure of the following items:
   a. Current expenditures on finding activities.
   b. Amount currently expensed for costs of unsuccessful ventures.
   c. Details of computing current amortization of capitalized finding costs.

d. Value of recoverable reserves at fair market value or at future net revenues discounted to present value.

e. Value of recoverable reserves on a country-by-country basis.

f. Deferred income tax for differences between book and tax treatment of finding costs.

6. Respondents highly recommended a uniform "successful efforts" method and did not accept a uniform "full cost" method. A "uniform minimum disclosure" statement under a uniform "successful effort" method was also acceptable to respondents more than a "uniform minimum disclosure" statement under a "full cost" method.

7. There was no difference of opinion among respondents of different classifications with respect to the above results except for a few items. These consisted of one reason for supporting the "successful efforts" method and the disclosure of some items in published financial statements. Despite the existence of such differences, opinions of the respondents under all classifications were in line with the overall opinions indicated above.

There is no satisfactory way to draw a universal conclusion based on a statistical evaluation of the hypotheses because responses were not received from the entire population. However, it was shown in this chapter

that the data are consistent with the hypotheses leading to the above results. The size of responses, the distribution of respondents geographically and in terms of different classifications, and the homogeneity of the population included lead to the assumption that the responses were representative of the population and useful results can be obtained from the survey.

Chapter III Footnotes

[1]1974 Membership Directory (New York: The Financial Analysts Federation, 1974).

[2]Gyan Chandra, "Disclosure: A Study of Consensus among Public Accountants and Security Analysts" (doctoral dissertation, Ohio State University, 1971), p. 78.

[3]Homer A. Brown, Jr., "Financial Statements for External Analysts: An Evaluation and a Proposal," (doctoral dissertation, Indiana University, 1968), pp. 178-179.

[4]W. J. Dixon, BMD Biomedical Computer Programs (Berkeley, California: University of California Press, 1973), pp. 119-131.

[5]Paul E. Green and Donald S. Tull, Research for Marketing Decisions (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966), p. 158.

[6]Morton Baker and Walter B. McFarland, External Reporting for Segments of a Business (New York: National Association of Accountants, 1968), p. 3.

[7]David M. Robinson, Writing Reports for Management Decisions (Columbus, Ohio: Charles E. Merrill Publishing Co., 1969), pp. 138-139.

[8]Taro Yamane, Statistics; An Introductory Analysis (New York: Harper & Row Publishers, 1967), p. 908.

[9]Cases in Public Accounting Practice, Volume 10: APB Public Hearing on Accounting and Reporting Practices in Petroleum Industry (Chicago, Illinois: Arthur Andersen & Co., 1972), p. 413.

[10]See for example Hutton's position paper submitted to Accounting Principles Board of the American Institute of Certified Public Accountants on November 12, 1971, in APB Public Hearing, Ibid., pp. 406-409.

[11]Frank E. Block, Senior Vice President of Girard Bank, a letter to Dr. Frances Stone, Chairlady of the Financial Accounting Policy, Committee of the Financial Analysts Federation, in APB Public Hearing, Ibid., p. 416.

[12]David Norr, "SEC Agenda," a supplement to Accounting Theory Illustrated (New York: First Manhattan Co., 1974), p. 3.

[13]Among his other positions: a director of the New York Society of security analysts, and associate editor of Financial Analysts Journal, see David Norr, "Investment Analyst's Views of Financial Reporting," Financial Executive (December, 1966), p. 22.

[14]David Norr, "Speech: Houston Society of Financial Analysts, September 25, 1974, Oil Accounting," First Manhattan Co.: Accounting, bulletin No. 15 (September 25, 1974), p. 20.

[15]Ibid., p. 19.

[16]"Accounting and Reporting," The Week in Review, by Haskin & Sells, Houston (November 30, 1973) p. 2.

[17]See John P. Klingstedt, "Full Costing in the Petroleum Industry and Its Implication for Accounting Principles and Practices," doctoral dissertation, North Texas University, 1969, p. 189; and Robert Kendrick Eskew, "An Empirical Examination of the Interactions between Accounting Alternatives and Share Price in the Extractive Petroleum Industry," doctoral dissertation, Perdue University, 1973, pp. 116-120.

[18]APB Public Hearing on Accounting and Reporting Practices in Petroleum Industry, p. 412.

[19]Norr, "Investment Analyst's Views of Financial Reporting," p. 22.

[20]The "uniform minimum disclosure" statement was suggested by Dr. Homer A. Brown, Financial Statements for External Analysts, pp. 178-179.

[21]K. Fred Skousen, et al., "Corporate Disclosure of Budgetary Data," Journal of Accountancy (May 1972), p. 50.

[22]The two percentages were calculated as of the total number of respondents who favored "successful efforts" method.

[23]Under question number 2e (Other), 27 respondents specified some other reasons.

[24]Under question number 3f (other), 10 respondents specified some other reasons.

[25]See Robert Kendrick Eskew, "An Empirical Examination of Interaction between Accounting Alternatives and Share Prices in the Extractive Petroleum Industry," doctoral dissertation, Perdue University, 1973; and Donald A. duBois, "Full-Cost Accounting for Exploration and Development Costs of Petroleum Companies: Its Effect on Stock Market Prices," doctoral dissertation, University of Missouri, 1974.

[26]Since the questionnaire was confidential, no names are disclosed in this research.

[27]Ibid.

[28]Ibid.

[29]A response of a Vice President of a financial corporation in New York City. Since the questionnaire was confidential, no names were provided in this research.

CHAPTER IV

EXAMINATION OF PRESENT REPORTING PROCEDURES OF OIL AND GAS FINDING COSTS

This chapter is mainly concerned with the examination of the 1973 published annual reports of oil and gas producing companies. This examination was made to determine the extent to which these companies have disclosed the different accounting treatments of finding costs and the information recommended by the financial analysts as indicated in the previous chapter. Surveys of accounting practices for finding costs, with emphasis on the most recent ones, will be briefly described. Although these surveys were primarily concerned with big integrated and international firms, which were not included in this research; such surveys serve as a background for the study performed in this chapter. No additional survey will be conducted in this chapter, but rather some comments will be made on the disclosure of finding costs based on a review of 1973 published annual reports of the oil and gas producing companies included in this study.

Surveys of Accounting Practices for Finding Costs

Horace R. Brock, Professor of Accounting at North Texas State College in Denton, published in 1956 a survey of accounting practices in 61 oil companies of different sizes.[1] Production of each company in the United States during 1953 varied between less than 1,000,000 bbls. and over 50,000,000 bbls. The 61 companies produced about 63 percent of the total United States output of crude oil in 1953. Data for the survey were secured from personal visits to 24 companies and from questionnaire returned by 37 other operators.[2] The survey revealed widely divergent practices in the oil industry. One of these was the difference between accounting for exploration conducted by the companies' own staffs and work performed by outside contractors. Costs of exploration work performed by the companies' own staffs, Brock stated, were currently expensed by 44 companies or 76 percent (of companies having such staffs). The rest of the companies utilizing their own staffs (14 companies or 24 percent) capitalized only costs of work leading to reserves. On the other hand, costs of work performed by outside exploration companies were currently expensed by only 22 companies or 37 percent (of companies whose exploration work was performed by outside contractors). Whereas the majority of the companies surveyed (38 or 63 percent) capitalized such costs if the work performed lead to reserves.

The survey indicated also wide variations in accounting

for costs of individual exploration activities. Examples of these activities were as follows: purchasing shooting rights, securing acreage selection options, acquisition of leases, retention and development of oil and gas leaseholds. All or part of the costs of these activities were currently expensed or capitalized. Amortization of capitalized costs was computed over a specific period of time for individual leases or groups of leases with the same expiration date or for each primary term length. An amortization reserve equal to some specified percentage of the total leasehold account was also maintained by some companies for amortizing the gross undeveloped property account. Details of these and other differences are not discussed in this chapter because it focuses on recent surveys.

The American Petroleum Institute published three surveys of certain accounting practices which have special significance to the petroleum industry. Data for these surveys were secured from questionnaires sent to petroleum companies. The first survey was published in 1965 and included 32 companies which responded to the questionnaire.[3] The second survey was published in 1967 to determine the extent to which petroleum companies had changed accounting practices since the 1965 survey. The 1967 survey included 39 companies. Thirty of these were included in the previous survey--reduced from 32 because of two mergers between reporting companies--and nine additional companies responded to

the 1967 survey. The 39 respondents were classified according to total assets, as of December 3, 1966, as follows: 14 companies--over $1 billion, 12 companies--$200 million but under $1 billion, and 13 companies--under $200 million.[4] The API report on this survey, however, indicated that the results by class were not of particular significance. Therefore, this report was mainly for the total group of companies included in the survey.

The latest API survey of accounting practices in the petroleum industry was published in 1974.[5] This survey included 30 companies of which 22 were included in the API previous survey. The thirty companies were classified by total assets as follows: large (assets over $4 billion), medium (assets of $1-4 billion), and small (assets under $1 billion). Accordingly the 1974 survey included 7 large, 10 medium, and 13 small companies.[6]

Price Waterhouse & Co. publishes annual surveys of financial reporting of the 30 largest petroleum companies. For each survey, selection of these companies was based on their ranking by total assets at the end of previous year. Consequently, some companies were replaced each year because of the changes in their ranks. Data for these surveys were secured from the published annual reports of the 30 companies. The latest survey, published by Price Waterhouse & Co. in 1974, was based on the 1973 annual reports.[7] It included 9 large, 12 medium, and 9 small companies. This is

on the basis of the classification determined by the API for its 1974 survey as previously indicated.[8]

Apparently, the API surveys provided more details on accounting treatments of finding costs than those obtained from Price Waterhouse & Co. surveys. This was because the published annual reports were the only source for the data used in Price Waterhouse & Co. surveys. However, each of the two organizations served different purposes by publishing their surveys of accounting practices in the petroleum industry. While the API surveys indicated how some of the significant expenditures were accounted for by the petroleum companies, Price Waterhouse surveys focused on what significant accounting policies were disclosed in the published financial statements of such major companies. Since this chapter is concerned with recent practices of reporting finding costs, only the 1974 surveys of the API and Price Waterhouse & Co. are discussed.

The API 1974 Survey

Accounting treatments of finding costs were presented in the API 1974 survey under five phases. These were as follows: prospecting and preacquisition activities, acquisitions of leaseholds and mineral rights, carrying leaseholds and mineral rights, exploration, and development.[9] Examples of expenditures on the activities included under each of these phases are indicated as follows:

1. Prospecting and preacquisition expenditures include those of magnometer surveys, shooting rights, acreage selection rights, options to acquire acreage, and geological and geophysical surveys. Such expenditures may be made prior to the acquisition of leasehold mineral rights.
2. Acquisition costs include expenditures for lease bonuses, lease extensions, surface rights, options exercised, title search, and geological and geophysical surveys (G&G) and drilling to acquire acreage.
3. After properties have been acquired, carrying costs may be necessary to maintain the leasehold interest. Such costs include delay rentals, minimum payments, ad valorem taxes and title defense.
4. More significant exploratory activities begin after properties have been acquired. Expenditures in this exploration phase include those incurred for geological and geophysical surveys conducted to determine the "area of interest" which indicate the most likelihood of production. When the "area of interest" is determined detailed surveys are then conducted to determine where drilling may be undertaken. Other expenditures may be incurred for the drilling of the company's own exploratory wells. Contributions may also be made to other companies for information on wells they are drilling on their properties. Examples of these are "bottom-hole contributions" which

are payable for data on wells drilled to specific depths, and "dry-hole contributions" which are payable only when the other party's well is nonproductive.

5. The development phase begins after the company has determined that there are hydrocarbon reserves of commercial value. Expenditures in this phase include intangible drilling costs for development wells and minimum payments to landowners which may be required during the development period under lease terms.

The survey indicated that there were divergent practices among respondents with respect to whether the above expenditures should be capitalized or expensed.[10] Examples of the results of this survey that show such a divergence are shown in Table 4-1.

A number of alternative methods and cost centers were used by the respondents for the disposition of capitalized expenditures. The API report on the survey indicated the number of respondents which followed each of these alternatives for the disposition of the expenditures incurred in each of the above phases. As a sample of these results, Tables 4-2 and 4-3 show methods and cost centers used by the respondents for the disposition of capitalized prospecting and preacquisition costs and exploratory intangible drilling costs, respectively.

TABLE 4-1

ACCOUNTING TREATMENTS OF SELECTED ITEMS OF FINDING COSTS ACCORDING TO THE API 1974 SURVEY OF ACCOUNTING PRACTICES IN THE PETROLEUM INDUSTRY (CAPITAL/EXPENSE DECISION)

Items	# of Companies*		
	Expense	Capital	Allocated
Prospecting & Reacquisition Costs:			
Surveys by outside crews	13	14	3
Survey by company crews	14	5	2
Shooting rights payments	12	13	3
Acquisition Costs			
G&G to acquire acreage	5	19	3
Drilling to acquire acreage	1	26	3
Carrying Costs:			
Delay rentals	26	4	--
Minimum payments--firm	13	8	-
Minimum payments--recoverable out of production	17	9	--
Exploration Costs--Postacquisitions/ Prediscovery:			
G&G surveys--outside	12	15	3
G&G surveys--company	13	6	1
Bottom-hole contributions-- successful	13	17	--
Development Costs:			
Dry footage below successful zones	19	10	--
Minimum payments--recoverable out of future production	14	12	--
Indirect general overheads	21	4	--

Source: 1974 Report on Certain Petroleum Industry Accounting Practices, pp. 9-22.

*Based on 30 petroleum companies surveyed. The transaction was not applicable to all companies where the total number of responses was less than 30.

TABLE 4-2

API 1974 SURVEY OF METHODS AND COST CENTERS FOR DETERMINING DISPOSITION OF PROSPECTING AND PREACQUISITION COSTS*

	Capital Cost Related To:		
	Acreage Not Acquired	Nonproductive Acreage	Productive Acreage
	(Number of Companies)		
Disposition Method			
Write off at time of loss of interest	15	4	--
Unit of production amortization			
Proved reserves	1	1	10
Developed reserves	3	3	15
Amortize estimated nonproductive amount over holding period	--	13	--
Other methods	2	4	1
Total responses	21	25	26
Cost Centers			
Prospect, survey, or area of interest	8	1	--
Lease	2	12	13
Field or zone	--	--	6
District or region	2	--	--
Country, continent or contiguous area	3	4	3
Organization unit	4	4	3
Total company	2	4	1
Total responses	21	25	26

Source: 1974 Report on Certain Petroleum Industry Accounting Practices, by American Petroleum Institute, Washington, D.C., p. 9.

*Based on 30 petroleum companies surveyed.

TABLE 4-3

API 1974 SURVEY OF METHODS AND COST CENTERS FOR DETERMINING DISPOSITION OF EXPLORATORY INTANGIBLE DRILLING COSTS*

	Capital Cost Related To:			
	Dry Holes	Contributions Successful Wells	Successful Wells	Drilling in Progress
Disposition Method				
Amortize estimated nonproductive amount over holding period	--	3	--	--
Unit of production amortization:				
Proved reserves	1	3	6	1
Developed reserves	4	11	20	4
Transfer to producing if successful, expense if dry	--	--	--	14
Other methods	--	1	1	1
Total responses	5	18	27	20
Cost Centers				
Well	--	--	1	14
Lease	1	8	10	1
Field or zone	--	1	8	--
Country, continent or contiguous area	3	4	4	3
Organizational unit	--	4	3	1
Total company	1	1	1	1
Total responses	5	18	27	20

Source: 1974 Report on Certain Petroleum Industry Accounting Practices, by American Petroleum Institute, Washington, D.C., p. 19.

*Based on 30 petroleum companies surveyed.

Price Waterhouse & Co. 1974 Survey

Results of this survey were presented under three classifications: lease acquisition costs, exploration costs, and intangible development costs.[11] Practices of reporting finding costs for only 23 petroleum companies were summarized in these surveys. These companies were not employing full costing or partial full costing in the year ending in 1973. Results of the survey for these 23 companies are summarized as follows:[12]

Lease Acquisition Costs

All companies surveyed initially capitalized lease acquisition costs which were then written off as follows:

	# of Companies
Properties proved productive:	
Unit of production	21
Unit of production or straight-line, depending on location	2
	23
Nonproductive properties:	
Single method:	
Amortization of all or part over period of holding until proved	18
Expensed on surrender or abandonment	2
Per unit-of-production based on estimated recoverable oil and gas reserves	1
Dual methods:	
Amortization of all or part over period of holding or until proved; unamortized balance expensed on surrender or abandonment	2
	23

Exploration Costs

The accounting treatments of exploration costs were as follows:

	# of Companies
Expense all exploration costs	9
Capitalize geological and/or geophysical costs resulting in the acquisition or retention of leases; expense all other exploration costs	10
Expense all exploration costs as incurred, other than as to Alaska where such costs were being deferred until production commences	1
No disclosure	3
	23

Intangible Development Costs

The accounting treatments of these costs were as follows:

	# of Companies
Productive costs capitalized and written off on unit-of-production basis; nonproductive costs expensed	19
Expensed in year of expenditure	2
Productive costs capitalized and written off 50% in first year and 5% annually for ten years; nonproductive costs expensed	1
Expensed in year of expenditure, except for certain foreign costs capitalized and amortized using the straight-line method	1
	23

Obviously, the above presentation indicates a variety of accounting treatments of finding costs of the oil and gas industry. The lack of adequate disclosure, however, made it impossible even for a professional to make a complete comparison

of such difference in accounting treatment. The report of Price Waterhouse & Co. 1974 survey stated:

> Because the different classification of costs and varying degrees of disclosure of accounting treatment, it is not possible to produce a complete comparison of the cost treatment followed by the companies surveyed.[13]

Company Selection

In compliance with the primary objectives of this study, the selection of oil companies for evaluating their disclosure of finding costs was designed to meet two requirements. Firstly, the major activity of the company should be exploring for and producing oil and gas. Secondly, the oil and gas producer should be operating through a public company with a reasonable number of shareholders and securities listed or traded in national securities exchanges. The most appropriate listing of such companies was found in the Directory of Companies Filing Annual Reports with the Securities and Exchange Commission. This Directory contained listings of companies required to file annual reports under the Securities Exchange Act of 1934 as of December 31, 1972. It included companies with securities listed on national securities exchanges, companies with securities traded over the counter which are registered under Section 12(g) of the Securities Exchange Act, and certain companies filing pursuant to Section 15(d) of the same Act as a result of having securities registered under the Securities Act of 1933.[14] In general each company was classified on the basis of its

major activity as determined by the product produced. The major line of activity as reflected by the gross revenues of the company was the principal criterion used in classifying the company. The information used for this purpose was obtained from the business description supplied by the companies in registration statements and periodic reports filed with the Commission.[15]

Under the classification "Crude Petroleum Extraction and Natural Gas," the above Directory listed 186 companies. The 1973 annual reports and a few 10-Ks—annual reports submitted to the Securities Exchange Commission--were received from 115 of these companies upon a mail request. The rest of the companies either had been liquidated, acquired by other companies, or did not respond. One of the annual reports received did not include an income statement because the company was now and did not have production by the end of 1973. Therefore, the annual reports of 114 companies were used, with the few 10-Ks, for the evaluation of finding cost disclosure in the following section. The names of these companies are listed in Appendix C. Total assets of each of these companies according to their balance sheets at the end of 1973 fiscal years was less than $1 billion. Therefore, all these companies are considered to be small according to the classification used in the API 1974 survey.

Evaluation of Disclosure of Finding Costs

Opinion No. 22 issued by the Accounting Principles Board in 1972 required the inclusion of all significant accounting policies of the reporting entity as an integral part of the financial statements. Accordingly, annual reports of all the 114 oil and gas producing companies included some disclosure of the accounting policies followed in the treatment of finding costs. This was expected because the above opinion stressed that such disclosure should particularly encompass a selection from existing acceptable alternatives or principles and methods peculiar to the industry in which the reporting entity operates. Both the "successful efforts" and the "full cost" methods are existing acceptable alternatives and the capitalization and expensing of finding costs are made under methods peculiar to the oil and gas industry. In addition, the choice of one of the above two alternatives would have a significant effect on the financial statements especially of those companies whose major activities is exploring for and producing oil and gas.

A review of significant accounting policies disclosed in the above annual reports revealed that the "successful efforts" method was used by 55 companies and the "full cost" method was used by 59 companies. Although some of the big-eight accounting firms announced their position towards the support of one of the above two methods, they are still

certifying financial statements prepared under the other method with no qualification as to the method used. Table 4-4 shows the names of the accounting firms and the number of companies audited by each firm under either the "successful efforts" method or the "full cost" method. The auditors' reports on the 1973 annual reports of the 114 companies included in this study indicated that the financial statements presented fairly the financial position of the company, the results of its operations and the changes in its financial position in conformity with "generally accepted accounting principles." In some instances, individual views of the accounting firms were against the accounting method for finding costs which was used in the preparation of the company's financial statements. While Arthur Andersen & Co. accounting firm issued clean opinion on some of the 1973 annual reports prepared under "successful efforts" method, its view was that such a method can lead to inaccurate conclusions and decisions. The position paper of this firm submitted in 1971 to the Committee on Extractive Industries of the Board of Accounting Principles concluded the following in support of the "full cost" method:

> Our view is that the accounting should be based on concepts and principles that best reflect the economic resources and income of producing oil and gas companies so that the facts are shown in the most logical and realistic manner for the benefit of all segments of society. Only in this way can investors . . . and all other interested parties have the financial information necessary to make informed judgements and decisions. On the other hand, less desirable accounting can lead to inaccurate conclusions and decisions.[16]

TABLE 4-4

ACCOUNTING FIRMS AUDITING OIL AND GAS PRODUCING COMPANIES UNDER EACH OF THE TWO METHODS*

Accounting Firms	Method Preferred**	# of Companies Using:		
		Successful Efforts	Full Cost	Total
Arthur Andersen & Co.	FC	9	15	24
Arthur Young & Company	SE	7	2	9
Coopers & Lybrand	N/A	3	1	4
Ernst & Ernst	N/A	1	2	3
Haskins & Sells	N/A	2	0	2
Peat, Marwick, Mitchel & Co.	N/A	10	18	28
Price Waterhouse & Co.	SE	4	5	9
Touche Ross & Co.	FC	0	4	4
Other firms	N/A	19	12	31
Total		55	59	114

*Based on 1973 annual reports of the 114 companies included in this study as listed in Appendix C.

**SE = "Successful Efforts" method, FC = "Full Cost" method, and N/A = Method preferred is not announced.

On the other hand, the accounting firm of Arthur Young & Company issued a clean opinion on the financial statements of two companies prepared under the "full cost" method while it stated in one of its publications in 1972 that:

> The full cost method inappropriately inflates income. . . . Inasmuch as financial statements prepared under the theories of full cost are value-oriented, they provide a distorted comparison to "cost" basis statements and place certain investors in this and other industries at a disadvantage.[17]

Apparently, the "generally accepted accounting principles" allowed the accounting firms to issue clean reports despite the fact that they believe that the accepted method used may lead to inaccurate decisions made by the investors. The effect on such decisions could be drastic when the information disclosed is not sufficient enough to permit comparison of the results of companies presented under the other method.

The degree of disclosure of accounting policies adopted for the treatment of finding costs varied among the reporting companies. However, the examination of accounting policies disclosed in the 1973 annual reports of the companies included in this study revealed a number of differences even among the companies using the "successful efforts" method or those using the "full cost" method. Examples of such differences under each of the two methods are indicated as follows.

Differences among Companies Using the "Successful Efforts" Method

Most of the companies capitalized acquisition and development costs until the results of exploration and drilling could be determined. When oil and gas properties become productive, i.e., can produce oil or gas in commercial quantities, costs are amortized. When producing properties become unproductive or when undeveloped properties are abandoned, the balance of capitalized costs is charged against earnings. The policy described in the annual report of Adobe Oil & Gas Corporation was "Expenditures incurred in acquiring and developing productive oil and gas properties are capitalized whereas expenditures relating to dry holes are charged against earnings." Also, the annual report of Equity Oil Company indicated that "The company capitalizes intangible development costs relating to productive areas and amortizes such costs." Other companies, however, followed different treatments in accounting for acquisition and development costs. EMC Energies, Inc., stated in its annual report "Externally generated costs of acquisition are capitalized," while carrying and exploration costs were currently expensed by the same company.

Different accounting treatments of acquisition and development costs, however, were followed by other companies. EMC Energies, Inc., for example, stated in its annual report "Externally generated costs of acquisition are capitalized," whereas carrying and exploration costs were currently expensed

by the same company.

Carrying costs were currently expensed or capitalized. The annual report of Great Yellowstone Corporation indicated that "lease rentals are expensed over the period to which they relate." In another example Helmet Petroleum Corporation stated in its annual report that "the Company adopted the policy of capitalizing, as carrying costs, all delay rentals related to undeveloped Canadian oil and gas properties."

While exploration costs were expensed by some companies, such costs were capitalized by others. The accounting policy described in the annual report of Canadian Superior Oil, Ltd., was: "Exploration expenditures and . . . applicable to both producing wells and dry holes are charged to income as incurred." Whereas the annual report of Intercontinental Energy Corporation indicated that the company "adopted a policy of capitalizing all petroleum and mineral acquisition and exploration costs on an individual property basis." Also, Hudson's Bay Oil and Gas Company Limited followed the policy of: "Exploration expenses are charged against earnings as incurred," whereas Canadian Export Gas & Oil Ltd. stated its policy as follows: "Costs of oil and gas rights and exploration costs are capitalized when acquired."

Tangible drilling and development costs were depleted by some companies with intangible drilling costs of producing

properties. Other companies treated tangible drilling costs as fixed assets subject to depreciation. According to the annual report of Flying Diamond Corporation "the company capitalizes all exploration and development costs applicable to producing oil and gas properties including tangible and intangible drilling and development costs and completion costs. . . ." The same treatment was indicated in other companies such as General American Oil Company of Texas, Adobe Oil & Gas Corporation, White Shield Corporation, and other companies. On the other hand, the annual report of American Quasar Petroleum Co. described the company's policy with regards to tangible drilling costs: "Well equipment and gathering facilities are amortized on a straight line basis over the lesser of their estimated useful lives or the remaining life of the related property (12 to 30 years)." May Exploration Ventures, Inc., indicated in its annual report that "Depreciation is provided on the straight-line basis at rates designated to extinguish the cost over estimated service lives of ten years for lease and well equipment. . . ."

The disposition of capitalized costs was made under many different methods. The depletion of such costs was sometimes based on a composite unit-of-production rate based on total estimated recoverable reserves of producing properties or both developed and undeveloped properties. The depletion rate was computed by some companies on the

basis of different cost centers such as the area of interest, the field, the lease, the individual property, and the well. Capitalized costs were sometimes depleted over a period of time on a straight-line basis. For example, Trans Ocean Oil, Inc., indicated in its annual report that "Costs associated with a producing field are depleted on the unit-of-production method over the remaining proven developed reserves of the field as estimated by the Company." The Superior Oil Company, in its annual report, stated that "Depletion and depreciation of producing oil and gas properties and related equipment are calculated on an individual property basis using the unit-of-production method." The annual report of White Shield Corporation indicated that "Capitalized costs for each area of interest will be amortized on a composite basis on the unit-of-production method, or will be charged to income upon cessation of activity in the area. Depletion policy described in the annual report of Exchange Oil & Gas Corporation indicated that depletion is "computed on the unit-of-production method on individual property areas, based on estimated net recoverable oil and gas reserves." Annual report of Eveter Oil Company was based on a lease cost center, while that of Hudson's Bay Oil and Gas Company Limited was based on a well cost center. Hiko Bell Mining and Oil Company elected a life of ten years for purposes of depletion on producing properties.

Costs of undeveloped properties were normally expensed when the property is abandoned, surrendered, or otherwise proved to be nonproductive. However, other treatments were used by some companies. General American Oil Company of Texas stated in its annual reports that "Costs for leases acquired before July 1, 1970, are written off when the properties are surrendered while costs of leases acquired after July 1, 1970, are amortized over estimated holding periods." In another company, Felmont Oil Corporation, the following policy was described in its annual report: "The Company's policy is to amortize a portion (generally 50% of the original cost which is based on its historical drilling success ratio, adjusted for current activity) of its investment in undeveloped leases over the period of time (generally five years) within which they must successfully develop or abandon such leases. If a lease is determined to be productive, the original cost is transferred to producing properties and becomes subject to depletion on the unit-of-production method as described above. Costs of nonproducing leases surrendered or otherwise disposed of are charged to reserve for amortization."

Differences among Companies Using the "Full Cost" Method

The 1973 annual reports of full-cost companies indicated also many differences in the accounting treatment of finding costs. Although such differences were primarily

found in determining the rate of depletion, there were other differences in determining the total depletable amount and in the treatment of costs of oil and gas properties outside the United States and Canada. In determining the total depletable costs, for example, McCulloch Oil Corporation included both tangible and intangible costs. But American Eagle Petroleums Ltd. described its policy: "Depreciation on lease and well equipment is provided on a unit-of-production lease," while the company used a composite rate for depletion of other oil and gas costs. Also, some companies used a company wide rate of depletion whereas other companies applied the rate on a country-by-country basis except for the United States and Canada which was considered one center. Apexo, Inc., stated in its annual report that "Capitalized costs of oil and gas properties are amortized on an overall unit-of-production method," while Can Del Oil Ltd. used five centers for allocating costs of exploration and development. One of these centers was North America (the United States and Canada), and the other four centers were in other countries. North Canadian Oils Limited excluded the cost of developed sub-lease from the total costs. The sub-lease was depleted in less than two years.

In computing the composite depletion rate under the "full cost" method, different bases were used as it was found in the companies annual reports. Many companies stated its policy that capitalized costs are charged to earnings by

the unit-of-production method based upon total estimated recoverable reserves. Examples of companies which used this policy in 1973 were: Aztec Oil & Gas Company, C & K Petroleum, Inc., and Buttes Gas & Oil Co. However, there were other methods used in determining the composite rate of depletion. Whereas some companies used the quantity of proved reserves, other companies computed this rate on the basis of proved developed reserves only. For example, Belco Petroleum Corporation described its policy of determining the composite depletion rate: "The provisition for amortization and depletion is determined by applying to the total oil and gas production an overall rate determined by dividing (i) the total cost of properties and related assets by (ii) the total proven reserves." But Galaxi Oil Company amortized capitalized costs "on a company-wide composite unit of production method based on consulting engineers' estimates of proved developed recoverable oil and gas reserves."

Other full-cost companies used the dollar value of oil and gas in determining the composite depletion rate. The following are examples of the policies described in the 1973 annual reports of these companies. Apexo, Inc., used "the ratio of current sales to the calculated future gross income, based on existing prices." Another company, Basin Petroleum Corp., stated that "Recoverable reserves of oil and gas are equated on the basis of relative sales prices at the end of each period. If costs are capitalized in excess

of the estimated economic value of total estimated proven oil and gas reserves, based on net realizable values discounted at 7%, plus the estimated fair value of undeveloped leaseholds, less a percentage risk factor, . . ., the excess costs are charged against income by an additional provision for depletion." Consolidated Oil & Gas, Inc., determines the composite rate as follows: "The factor is determined by relating values of oil and gas production during the period to comparable values of estimated oil and gas reserves at the beginning of the period. The values of oil production and reserves are based on the average prices received during the period and the values of gas production and reserves are based on the average actual prices to be received over the life of the gas contracts or on the estimated average contract prices expected for gas not yet under contract." Scurry-Rainbow Oil Limited included exploration overhead costs in the total capitalized costs, and the rate of depletion was computed by the unit-of-production method based on "the total estimated reserves of oil, gas, and other salable products."

In summary, the above review of the 1973 annual reports of the oil companies included in this study indicated the following:

1. Approximately half of these companies followed the "successful efforts" method in reporting finding costs. The other half used the "full cost" method.

2. Widely divergent practices of reporting finding costs existed among either successful-efforts or full-cost companies. However, disclosure of these different practices in the published financial statements was not adequate enough to show the effect of such practices on the annual results. This effect should be disclosed if such results were to be compared with those of other companies following different practices.
3. Divergence in accounting practices among the successful-efforts companies included the treatments of costs incurred during all preproduction phases. Such differences were not significant among the full-cost companies where all finding costs were capitalized.
4. Divergent accounting practices did not result only from the companies' decisions to capitalize or to expense finding expenditures, but also from the different methods and bases used for determining the disposition of capitalized costs. This is true whether the companies followed the "successful efforts" or the "full cost" method.

Disclosure of Information Recommended by the Financial Analysts

The examination of the 1973 annual reports and the 10-Ks was extended to determine whether such reports have disclosed the information recommended by the oil and gas analysts in their response to the questionnaire conducted

in this study. As indicated at the end of the previous chapter, the items recommended for disclosure in the annual reports of oil and gas producing companies were: current expenditures on finding activities, amount currently expensed for costs of unsuccessful ventures, details of computing current amortization of capitalized finding costs, value of recoverable reserves at fair market value or at future net revenues discounted to present value, value of recoverable reserves on a country-by-country basis, and deferred income tax for differences between book and tax treatment of finding costs. Table 4-5 shows the number of companies included in this study which disclosed these items in their 1973 annual reports. It was observed that most of the companies disclosed current expenditures on finding activities. This item was usually found in the statement of changes in financial position, and sometimes in the president's review of the company's activities or in the historical comparative data. Costs of unsuccessful ventures were disclosed by approximately half of the companies. The policy of amortizing capitalized costs was disclosed in different degrees with the footnotes on the annual reports. However, the details of the rate of amortization was discloed only by 8 companies. While three companies only disclosed the value of recoverable reserves, which is significant as the most important asset of oil and gas producing companies, 21 annual reports disclosed the quantity of estimated reservoirs. Although it is

TABLE 4-5

NUMBER OF COMPANIES DISCLOSING ITEMS RECOMMENDED BY OIL AND GAS FINANCIAL ANALYSTS*

Item	No. of Companies
a. Current expenditures on finding activities	102
b. Amount currently expensed for costs of unsuccessful ventures	57
c. Details of computing current amortization of capitalized finding costs	8
d. Value of recoverable reserves:**	
at fair market value	2
at future net reserves discounted to present value	1
e. Value of recoverable reserves on a country-by-country basis	2
f. Deferred income tax for differences between book and tax treatment of finding costs	40

*Based on 114 annual reports of oil and gas producing companies.

**Estimated recoverable reserves was disclosed in quantity by 21 companies.

also considered to be useful, from the point of view of the investors, to disclose the value of reservoirs on a country-by-country basis, only two companies disclosed such information. Deferred income taxes for differences between book and tax treatment of finding costs was disclosed by only 40 companies. Some companies did not provide for such deferred taxes. An example of the justification for such a position was indicated in the 1973 annual report of Hanover Planning Company, Inc. "Deferred income taxes will be provided at such time as intangible drilling and development costs capitalized for financial statement purposes exceed estimated future tax deductions for statutory depletion." Also, Galaxy Oil Company stated in its annual report that "Deferred income taxes on such timing differences are provided for only to the extent that future tax deductions including statutory depletion on oil and gas properties are less than capitalized costs."

Summary

Findings of the examination of the 1973 annual reports of the oil and gas companies included in this study are summarized as follows:

1. Neither the "successful efforts" method nor the "full cost" method can be considered predominate in reporting finding costs of the above companies.
2. Existing practices of reporting finding costs, whether the "successful efforts" method or the "full cost" method

was being used, do not allow for comparability among reporting units.

3. The information desired by the oil and gas financial analysts was not adequately disclosed.

According to these findings one cannot accept the second primary hypothesis that "finding costs of oil and gas producing companies are adequately disclosed in a manner that meets the needs of oil and gas financial analysts for comparability between financial statements prepared under the 'successful efforts' method or the 'full cost' method." The logical conclusion to be drawn from the preceding examination is that more uniformity and disclosure is necessary to improve reporting of finding costs of oil and gas producing companies.

Chapter IV Footnotes

[1]Horace R. Brock, "Petroleum Accounting," The Journal of Accountancy (December 1956), pp. 53-67.

[2]Ibid., p. 53.

[3]Report on Certain Petroleum Industry Accounting Practices (Washington, D.C.: American Petroleum Institute, 1967), p. v.

[4]Ibid.

[5]Report on Certain Petroleum Industry Accounting Practices (Washington, D.C.: American Petroleum Institute, 1974).

[6]Ibid., p. 6.

[7]1974 Survey of Financial Reporting and Accounting Development in the Petroleum Industry (New York: Price Waterhouse & Co., 1974), pp. 27-31.

[8]Ibid., p. 7.

[9]1974 Report on Certain Petroleum Industry Accounting Practices, pp. 7-36.

[10]Ibid., pp. 9-24.

[11]1974 Survey of Financial Reporting and Accounting Development in the Petroleum Industry, pp. 27-31.

[12]Ibid.

[13]Ibid., p. 28.

[14]Directory of Companies Filing Annual Reports with the Securities and Exchange Commission (Washington, D.C.: Securities and Exchange Commission, December 1972), p. I.

[15]Ibid., pp. I-II.

[16]APB Public Hearing on Accounting and Reporting Practices in the Petroleum Industry (Chicago, Illinois: Arthur Andersen & Co., 1972), p. 259.

[17]Stanley Porter, "Full Cost" Accounting: The Problem It Poses for the Extractive Industries (New York: Arthur Young & Company, 1972), pp. 17 and 37.

CHAPTER V

PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS AND FULL-COST METHODS

Introduction

This research focused on the prediction of three variables which are of interest to the investor: net income per share, "cash flow" per share, and rate of return on total assets. For each of these variables, historical data of the previous four years were used to project the data of the fifth year.

Because extraordinary gains and losses are nonrecurring, it was decided to use the net operating income per share for the purpose of projections. "Cash flow" per share is net operating income after adding back expenses that do not require outlay of funds. In general, these expenses include depreciation, depletion, amortization, abandoned leases, and dry holes if the "successful efforts" method is used. Under the "full cost" method, costs of abandoned leases, dry holes and other losses of unsuccessful ventures are not recognized as expenses except for the amount amortized or depleted. Therefore, the amount added back to reported net operating income for determining the "cash flow" under the "full cost" method is the total of depreciation,

amortization and depletion. Rate of return on total assets is computed by dividing annual net operating income by total assets at the end of the year.

Data of the three variables were obtained from the published annual reports, the 10-Ks, or by a written request mailed to the selected companies. In order to obtain these data, the companies were assured that the information provided by them are confidential and will be used in aggregate totals. Therefore, the raw data obtained from the companies were not disclosed in this research.

Company Selection

Since the relative impact of the two accounting methods of finding costs on the financial statements of the big integrated, multinational oil companies would be much less significant for this type of company. This is true because these companies are engaged heavily in many activities other than oil and gas exploration. Therefore, it was decided not to include such companies in the selected sample.

A list of all companies, whose major activity is crude petroleum extraction and natural gas, was obtained from the 1972 Directory of Companies Filing Annual Reports with the Securities and Exchange Commission under the Securities Exchange Act of 1934.[1] The list contained 186 companies. Annual reports and 10-Ks of the years from 1968 through 1973 were requested from all these companies by a letter followed by a

second request for those who did not respond within thirty days from the first request. Annual reports of 115 companies and a few 10-Ks were received. The rest of the companies were liquidated, acquired by other companies, or did not respond.

All published annual reports and 10-Ks received were reviewed to determine which of the two alternative methods--the "successful efforts" method or the "full cost" method--was used; and if there was a shift from one method to another, when was the shift to the new method in effect. This information should be disclosed according to Opinion No. 22 of the Accounting Principles Board of the American Institute of Certified Public Accountants. Companies which shifted from one method to another during the year 1968 or thereafter disclosed the retroactive effect of the change to the new method, at least in the aggregate and for the previous year. The disclosure in most cases, however, was not enough to provide annual retroactive data for a period of five years as required for the planned projections. It was necessary to contact the oil companies which may have retroactive annual data for a period of five years. All possible efforts were made to obtain the required data. This is to complete the data of the three variables--earnings per share, "cash flow" per share, and rate of return on total assets--under the two methods for a five-year period. Finally, available data were only enough to complete the information required for five companies concerning the same five-year period from 1964 through 1968, and for another five companies concerning different five-year periods between 1963 and 1973. The rest of the oil companies

did not disclose their results under the two alternative methods for any five-year period. Some of these companies were newly organized. The other companies either did not change their method of accounting for finding costs, or shifted to the other method without considering or maintaining information on the retroactive annual effect of the newly adopted method.

Another attempt was made to increase the sample to the largest possible size. It was possible to collect data for 31 companies under the "successful efforts" method and for 37 companies under the "full cost" method concerning the same five-year period from 1969 through 1973. One company only was included in both groups because its data under each of the two alternative methods was available for the above period. A decision based on this sample could possibly be biased because different results may be attributed to differences between the companies of the two groups rather than to different method of accounting for finding costs. However, it would be of interest to find out whether similar results could be obtained from a larger sample size where the companies of each group were different.

In summary, the data available for evaluating predictive ability of the two alternative methods are: (1) data for five companies reported under each of the two methods for the same five-year period from 1964 through 1968, (2) data for ten companies--including the first five companies listed under No. (1) above--reported under each of the two methods

for different five-year periods between 1963 and 1973, and (3) data for two groups of different companies (except one) concerning the same five-year period from 1969 through 1973. One group consisted of 31 successful efforts companies and the other group consisted of 37 full-cost companies.

Since the practice of reporting retroactive effect of changes in accounting policies was adopted in 1968, few oil companies maintain record of previous years data under each of the "successful efforts" method and the "full cost" method. It is not possible at the present time to have a sample large enough to provide accurate results of the comparison between the two methods in terms of their predictive ability. It was therefore decided to make an exploratory research based on the available information indicated above and bearing in mind the limitations imposed by these different samples. Such exploratory work requires only descriptive statistics and no statistical inference can be made in terms of the relative predictive ability of the two methods at the present time. Of course, after the passage of some years, more companies will provide comparative information of the effect of applying each of the two alternative methods to the same company especially if the present trend of shifting to the "full cost" method continues at the same pace. The exploratory work in this research will certainly be a starting point in that respect.

Methodology

The predictive ability of the two accounting methods was compared by using both simple and multiple regression analysis. The work was done by utilizing REGRAN (Veldman, 1967) program[2] at the University of Oklahoma computer center. This is a multiple linear regression program. It was used to predict the outcome of the fifth fiscal year by a least-square combination of the outcomes for the preceding four fiscal years. Specifically,

$$Y_5 = Y_1A_1 + Y_2A_2 + Y_3A_3 + Y_4A_4 + Y_5A_5$$

where the Y's represent the years, and the A's are constants which yield a least-squares combination of the years.

When using multiple linear regressions the efficiency of the prediction is determined by correlating the predicted outcome, so that the more accurate a prediction is, the closer the correlation approaches one. This correlation is the multiple correlation coefficient "R".

Results and Discussion

The presentation and the discussion of the results will begin with the simple linear regression of the five companies with contemporaneous reporting period (1964-1968), and the ten companies with non-contemporaneous periods (between 1963-1973). This will be shown under each of the two methods--the "successful efforts" method and the "full cost" method--in terms of each of the following: earnings

per share (Tables 5-1, 5-2), "cash flow" per share (Tables 5-3, 5-4), and rate of return on total assets (Tables 5-5, 5-6). Since the number of observations in the first sample (five companies) did not exceed the number of variables (five years), multiple correlation results of this sample was not useful in evaluating the predictive ability of the two methods. Whenever the number of variables equals the number of observations, the multiple correlation will always be 1.00, and linear prediction will be perfect. Therefore, the results of the multiple linear correlation will be discussed only with respect to the second sample (the ten companies) and the third sample (the sixty seven companies).

Table 5-1 shows the Rs under each of the two methods for earnings per share. Under each of the five columns (five years), each number indicates the R of predictions from the corresponding year number on the horizontal line. For example, R is -0.6 for predicting year 5 from year 1, and is 0.18 for predicting year 4 from year 2 under "successful efforts" method. This table shows that the Rs under "full cost" method were higher than those under "successful efforts" method and also closer to 1.00 for all predictions except for two cases only. One of these when the fourth year data was used to predict the fifth year earnings per share. The R under "successful effort" method was 0.97 compared with 0.85 under "full cost" method. The second exception when the first year data was used to predict the second year earnings per share.

TABLE 5-1

INTERCORRELATION MATRICES OF FIVE YEARS DATA FOR EARNINGS PER SHARE*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.98	0.55	-0.03	-0.06
2	0.98	1.00	0.71	0.18	0.13
3	0.55	0.71	1.00	0.80	0.75
4	-0.03	0.18	0.80	1.00	0.97
5	-0.06	0.13	0.75	0.97	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.82	0.95	0.95	0.95
2	0.82	1.00	0.91	0.94	0.68
3	0.95	0.91	1.00	0.95	0.92
4	0.95	0.94	0.95	1.00	0.85
5	0.95	0.68	0.92	0.85	1.00

*Based on five companies with contemporaneous reporting period (1964-1968).

The R under "successful efforts" method was 0.98 compared with 0.82 under "full cost" method.

The differences between the Rs under the two methods became very large especially when the first or the second year data was used to predict the fifth year data. The R resulting from predicting the fifth year from the second year data under "successful efforts" method was 0.13 compared with 0.68 under "full cost" method. In the case of predicting the fifth year from the first year data the difference was more clear. The R was negative (-0.06) under "successful efforts" method compared with 0.95 (positive) under "full cost" method.

When a year-to-year comparison was made, it was clear that the Rs under "full cost" method were always higher than those under "successful efforts" method. For example, when predicting the fourth year from the third year, and predicting the third year from the second year; the "full cost" method provided greater Rs. In the first example the R was 0.95 under "full cost" method compared with 0.80 under "successful efforts" method, and in latter one the R was 0.91 under "full cost" method compared with 0.71 under "successful effort" method.

Table 5-2, of the ten companies with non-contemporaneous five-year periods, shows the same results of the five companies with contemporaneous reporting period (shown in Table 5-1) for earnings per share. For all the predictions, the Rs for "full cost" reported earnings per share were greater and

TABLE 5-2

INTERCORRELATION MATRICES FOR FIVE YEARS DATA FOR EARNINGS PER SHARE*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.82	0.68	0.26	0.16
2	0.82	1.00	0.67	0.27	0.30
3	0.68	0.67	1.00	0.85	0.78
4	0.26	0.27	0.85	1.00	0.94
5	0.16	0.30	0.78	0.94	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.70	0.89	0.77	0.61
2	0.70	1.00	0.90	0.92	0.75
3	0.89	0.90	1.00	0.94	0.84
4	0.77	0.92	0.94	1.00	0.91
5	0.61	0.75	0.84	0.91	1.00

*Based on ten companies with non-contemporaneous reporting periods (between 1963-1973).

closer to 1.00 compared with those calculated under "successful efforts" method except for two cases. One of these with a small difference when the fifth year was predicted from the fourth year data (0.94 under "successful efforts" and 0.91 under "full cost"), and the other when the second year was predicted from the first year data (0.82 under "successful efforts" and 0.70 under "full cost"). Larger differences were also noted when the fifth year predictions were based first or second year of the five-year period. For example, fifth year predictions from first year data had R = 0.61 under "full cost" compared with 0.16 under "successful efforts," and fifth year prediction from second year data had R = 0.75 under "full cost" compared with 0.30 under "successful efforts." The difference, however, was less than that of the five companies in Table 5-1.

It was noticed also that in the predictions of the third or fourth year from previous years' data, the "full cost" method showed greater Rs all the time. From this and the above discussion, some indications were noticed about the predictive ability of the two methods in terms of reported earnings per share. Although predictions of the fifth year from the fourth year data under "successful efforts" method were slightly better, "full cost" method provided, in general, better predictions of the five-year period for both the two samples (the five and the ten companies). Another important notice was drawn from the above tables (5-1, 5-2). Under the

two methods, projections improved when the base year (of which the data was used for predicting purposes) approached the year of which earnings per share were predicted. However, the range between highest and lowest predictive ability of previous years (i.e., ability of each of years 1 through 4 to predict year 5, or each of years 2 and 3 to predict year 4) was much narrower under "full cost" method than the range under "successful efforts" method. In predicting the fifth year for the ten-companies sample, this range was 0.30 (0.91 less 0.61) under "full cost" method compared with 0.78 (0.94 less 0.16) under "successful efforts" method. In predicting the fourth year for the same sample, the range was 0.17 (0.94 less 0.77) under "full cost" method compared with 0.59 (0.85 less 0.26) under "successful efforts" method (see Table 5-2). The five-companies sample showed narrower ranges under "full cost" method and wider ranges under "successful effort" method (see Table 5-1). Apparently, these results indicated remarkable smoothing of earnings per share under "full cost" method compared with wide fluctuations under "successful efforts" method. This was obviously because of expensing the cost of unsuccessful exploration and development activities over a long period under "full cost" method.

A different picture of the predictive ability of "cash flow" per share under the two methods was obtained for both the five companies and the ten companies samples (Tables 5-3 and 5-4). Both the two methods indicated relatively high

TABLE 5-3

INTERCORRELATION MATRICES OF FIVE YEARS DATA FOR "CASH FLOW" PER SHARE*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.87	0.98	0.92	0.82
2	0.87	1.00	0.89	0.81	0.66
3	0.98	0.89	1.00	0.97	0.90
4	0.92	0.81	0.97	1.00	0.97
5	0.82	0.66	0.90	0.97	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.94	0.80	0.77	0.66
2	0.94	1.00	0.95	0.94	0.87
3	0.80	0.95	1.00	0.99	0.96
4	0.77	0.94	0.99	1.00	0.96
5	0.66	0.87	0.96	0.96	1.00

*Based on five companies with contemporaneous reporting period (1964-1968).

TABLE 5-4

INTERCORRELATION MATRICES FOR FIVE YEARS DATA
FOR "CASH FLOW" PER SHARE*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.91	0.98	0.92	0.86
2	0.91	1.00	0.92	0.85	0.76
3	0.98	0.92	1.00	0.95	0.91
4	0.92	0.85	0.95	1.00	0.98
5	0.86	0.76	0.91	0.98	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.77	0.72	0.68	0.56
2	0.77	1.00	0.97	0.96	0.90
3	0.72	0.97	1.00	0.99	0.96
4	0.68	0.96	0.99	1.00	0.97
5	0.56	0.90	0.96	0.97	1.00

*Based on ten companies with non-contemporaneous reporting periods (between 1963-1973).

predictive ability but the ranges between highest and lowest Rs for projections of any fiscal year were generally narrower under "successful efforts" methods. In the ten-companies sample (Table 5-4), the range of the Rs for the fifth year projections from previous years was 0.22 (0.98 less 0.76) under "successful efforts" method compared with 0.41 (0.97 less 0.56) under "full cost" method. The range was 0.10 (0.95 less 0.85) for projections of the fourth year under "successful efforts" method compared with 0.31 (0.99 less 0.68) under "full cost" method. In the five-companies sample (Table 5-3), the range of the Rs for the fifth year projections under "successful efforts" method was 0.01 more than the range of the Rs under "full cost" method (0.97 less 0.66 compared with 0.96 less 0.66 under the two methods, respectively). But for the fourth year projections, the range of the Rs under "successful efforts" was narrower than the range of the Rs under "full cost" method by 0.05 (0.97 less 0.81 compared with 0.99 less 0.77 under the two methods, respectively. This indicated that "cash flow" per share became even smoother under "successful efforts" method. Such smoothing effect can be explained by adding back expenses which did not require funds outlay to reported net income in order to obtain the "cash flow" amount.

Two observations were obtained from comparing the intercorrelation matrices of the "cash flow" per share with those of earnings per share, especially with respect to the

ten-companies sample. The first observation was that the use of "cash flow" mitigated the fluctuation effect on earnings per share reported under "successful efforts." Consequently, "cash flow" per share under "successful efforts" method became more meaningful in terms of its predictive ability. Secondly, this result agreed with the notion that "cash flow" is more meaningful than reported net income because it helps to iron out some of the differences in accounting procedures. A notion which is popular among financial analysts.

Tables 5-5 and 5-6 show intercorrelation matrices of five years data for rate of return on total assets based on the five- and the ten-companies samples. In the five-companies sample, the "full cost" method provided better projections of rate of return on total assets than the "successful efforts" method except in two cases. These were when year 1 was used to predict year 2, and when year 4 was used to predict year 5. The "successful efforts" method provided better predictions of rate of return on total assets than the "full cost" method. In the ten-companies sample, the "full cost" method provided also better predictions of this rate except in three cases. These were when year 3 was used to predict year 4, and when years 3 and 4 were used to predict year 5. When comparing the above results with those obtained in terms of earnings per share, predictive ability of both methods in terms of rate of return on total assets was considered to be poor. Such results reflected the fact that capital expenditures

TABLE 5-5

INTERCORRELATION MATRICES FOR FIVE YEARS DATA FOR RATE OF RETURN ON TOTAL ASSETS*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.95	0.56	-0.11	-0.95
2	0.95	1.00	0.60	0.17	-0.88
3	0.56	0.60	1.00	0.40	-0.28
4	-0.11	0.17	0.40	1.00	0.27
5	-0.95	-0.88	-0.28	0.27	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.92	0.64	0.97	0.36
2	0.92	1.00	0.76	0.98	0.09
3	0.64	0.76	1.00	0.69	0.39
4	0.97	0.98	0.69	1.00	0.16
5	0.36	0.09	0.39	0.16	1.00

*Based on five companies with contemporaneous reporting period (1964-1968).

TABLE 5-6

INTERCORRELATION MATRICES OF FIVE YEARS DATA FOR RATE OF RETURN ON TOTAL ASSETS*

Under Successful Efforts					
Year	1	2	3	4	5
1	1.00	0.86	0.38	0.13	-0.16
2	0.86	1.00	0.19	0.09	-0.16
3	0.28	0.19	1.00	0.83	0.31
4	0.13	0.09	0.83	1.00	0.50
5	-0.16	-0.16	0.31	0.50	1.00

Under Full Cost					
Year	1	2	3	4	5
1	1.00	0.92	0.54	0.86	0.48
2	0.92	1.00	0.63	0.91	0.45
3	0.54	0.63	1.00	0.60	0.24
4	0.86	0.91	0.60	1.00	0.47
5	0.48	0.45	0.24	0.47	1.00

*Based on ten companies with non-contemporaneous reporting periods (between 1963-1973).

for exploration and development of oil and gas bear no predictable relationship to current net income. One of the characteristics of oil and gas industry is that large amounts of money should be spent in exploration and development of a particular mineral deposit well in advance of the knowledge whether minerals will be found. It may take more than five years to develop a field for production.[3] Such expenditures are capitalized at least until it can be decided whether exploration and development activities are successful or not. Under "successful efforts" method, when these activities prove to be unproductive, capitalized exploration and development expenditures should be expensed. Consequently, the effect on net income may be significant. These facts if combined with results obtained from the two samples, as indicated in Tables 5-5 and 5-6, provided an indication that the rate of return on total assets was subject to wider fluctuations than those of net income per share and "cash flow" per share.

Multiple correlation coefficients for predicting fifth year data from first through fourth year, in terms of earnings per share, "cash flow" per share, and rate of return on total assets were compared for the ten-companies sample as shown in Table 5-7.

Multiple correlation coefficients for the ten-companies sample supported the results of the simple regression analysis previously described. "Full cost" method

TABLE 5-7

COMPARISON OF MULTIPLE CORRELATION COEFFICIENTS FOR PREDICTING YEAR 5 DATA FROM YEARS 1 THROUGH 4*

	Under Successful Efforts	Under Full Cost
Earnings per share	0.94	0.97
"Cash flow" per share	0.98	0.87
Rate of return on total assets	0.87	0.93

*Based on ten companies with non-contemporaneous reporting periods (between 1963 and 1973).

provided better predictive ability in terms of both earnings per share and return on total assets, but the predictive ability of "successful efforts" method was superior in terms of "cash flow" per share.

The third sample consisted of 67 companies. Thirty companies of these reported under "successful efforts" method, thirty-six companies reported under "full cost" method, and one company reported under each of the two methods to show the retroactive effect of shifting to "full cost" method. The multiple correlation coefficients of this sample are shown in Table 5-8.

The results of the third sample (67 companies) showed opposite results to those obtained from the second sample (10 companies) in terms of earnings per share and rate of return on total assets only. Better predictive ability in these cases was shown under the "successful efforts" method

TABLE 5-8

COMPARISON OF MULTIPLE CORRELATION COEFFICIENTS FOR PREDICTING YEAR 5 DATA FROM YEARS 1 THROUGH 4*

	Under Successful Efforts	Under Full Cost
Earnings per share	0.89	0.77
"Cash flow" per share	0.99	0.95
Rate of return on total assets	0.88	0.66

*Based on 67 companies with contemporaneous reporting period from 1969 through 1973. Of these 31 companies reported under "successful efforts" method and 37 companies reported under "full cost" method (including one company reported under both methods).

than under the "full cost" method. As previously mentioned, these results could be biased because the increase or decrease of the Rs could be attributable to differences between the activities of the companies in each group rather than to using different methods in accounting for finding costs of oil and gas. One useful observation was obtained from testing the predictive ability of this sample (67 companies). The superiority of "successful efforts" method predictive ability in terms of "cash flow" per share is still unchallenged.

The above analysis had some limitations which should be kept in mind before drawing a conclusion. The number of companies in the first sample was very small (5 companies). In the second sample, the ten companies, the data were obtained for non-contemporaneous periods; and in the third

sample, the 67 companies, the two groups compared consisted of different companies (except one company reported results of the two methods). A conclusion based on the results of the third sample would be biased because differences in predictive ability could be attributable to pre-existing differences between the two groups. Although some noise could be caused by using non-contemporaneous periods in the second sample, the results obtained from this sample was considered the best among those obtained from the other two samples. However, the size of the second sample (ten companies) was not large enough to allow a generalization of the results obtained from its analysis. Since the above were all possible samples which could be obtained at the present time, conclusions drawn from these samples were considered to be of exploratory nature.

Summary

The "successful efforts" and the "full cost" methods were evaluated in terms of their predictive ability of three variables which are of primary interest to the investor: earnings per share, "cash flow" per share, and rate of return on total assets. In order to obtain comparable data, three conditions were required: (1) the major activity of selected companies should be exploring for and producing oil and gas, so that the effect of different methods of accounting for finding costs would be clearly reflected in reported net income, (2) operating results should be available for the

same company under each of the two methods, so that the change of results should be attributable only to the change of the accounting method, and (3) the five-year period used for comparison should be contemporaneous, so that the change of the results would not be attributable to different circumstances of other fiscal years. When all the three conditions were considered, it was not possible to obtain data on earnings per share, "cash flow" per share, and rate of return on total assets for more than five companies. When the third condition was excluded, it was possible to increase the sample size by another five companies so that some results could be obtained from the ten-companies sample. When the second condition only was excluded, it was possible to obtain 31 financial statements under successful efforts and 37 under full cost for the same period (1969-1973).

Given the paucity of comparable data, this study was done using three different samples. The first sample consisted of five oil producing companies which provided data under both the "successful efforts" and the "full cost" methods over a contemporaneous five-year period (1964-1968). The second sample consisted of ten oil producing companies which provided data under both the "successful efforts" and the "full cost" methods over non-contemporaneous five-year periods between 1963 and 1973. The third sample consisted of 67 oil producing companies with contemporaneous reporting period from 1969 through 1973. Of these 31 companies

reported under the "successful efforts" method and 37 companies reported under the "full cost" method (including one company reported under both methods).

Tentative results, subject to the limitations indicated in this chapter, were obtained from the above exploratory study made on the predictive ability of both methods. The analysis tended to suggest that the "full cost" method provided greater predictive power when dealing with earnings per share and rate of return on total assets. On the other hand, the "successful efforts" method provided greater predictive power when applied to "cash flow" per share. It was noted though that the predictive power of both accounting methods was rather impressive when applied to "cash flow" per share. This provided one answer to the question of why financial analysts favor cash flow from operations over reported net income. Obviously, when adding back such expenses as those of dry holes and abandoned leases and other exploration costs which are, in most cases, not associated with current revenues, cash flow from operations would be highly smoothed and consequently would show greater predictive power. This is clear especially in accounting under the "successful efforts" method.

These conclusions, however, should be considered tentative and suggestive of further research. The paucity of comparative data will not continue in the future especially if the shift to "full cost" accounting continues at the

present pace. This is because retroactive effects of the shift to another accounting method will be disclosed in published annual reports. At that time more accurate results can be obtained from annual reports with comparative data prepared under the other method retroactively.

Chapter V Footnotes

[1]Directory of Companies Filing Annual Reports with the Securities and Exchange Commission under the Securities Exchange Act of 1934 (Washington, D.C.: Securities Exchange Commission, December, 1972), pp. 219-223.

[2]Donald J. Veldman, Fortran Programming for the Behavioral Sciences (New York: Holt, Rinehart and Winston, Inc., 1967).

[3]Robert E. Field, "Financial Reporting in the Oil Industry," Price Waterhouse & Co. Review (Volume 19, Number 1, 1974), p. 7.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

Conclusion

It has been accepted tacitly that accounting data is utilitarian. More attention has been given to the users of the financial reports, especially those who have limited authority, ability, or resources to obtain information and who rely on financial statements as their principal source of information about economic activities of the reporting unit. The recent view of accounting as an information system requires that published financial statements convey a useful message to those who are interested in making investment in corporate stock. In order for this message to be useful, its content should at least meet the needs of those who regularly make the investment decision, particularly the financial analysts. An informed decision, however, cannot be made without comparable data.

While accounting for finding costs has been a problematic area in financial reporting of the petroleum industry, the emergence of full-cost accounting in the last two decades made the problem much worse. The comparability of annual reports even within the oil industry became

very difficult, if not impossible. No final position has been taken by either the American Institute of Certified Public Accountants through its Boards or the Securities Exchange Commission to solve this problem. Consequently, the two methods, the "successful efforts" method and the "full cost" method, are still practiced under the "Generally Accepted Accounting Principles." Therefore it was not surprising to find some big accounting firms certifying, with no qualification, financial statements of oil and gas companies prepared under a method which they strongly believe that such a method distorts the financial results of the reporting unit. Because this method is generally accepted, no qualification is required. Such a situation brought up to the accounting profession a serious dilemma which must be solved.

Proponents of either the "successful efforts" or the "full cost" methods focused on the needs and the interest of investors. This is to support their arguments for or against one of these methods. They argued that the other method, if not harmful, is less appropriate to investors. Therefore, this study conducted a questionnaire to solicit the opinion of the financial analysts--whose specialty is oil and gas securities--as to which method is better than the other, the reasons for such favorability, and what information is recommended for inclusion in the financial statements to improve reporting finding costs of

oil and gas. Usable responses were 310 representing 40.3% of all oil and gas financial analysts (770 members of the American societies of financial analysts). This rate of response was fairly higher than what was usually received in similar situations.

It was found that the respondents highly favored the "successful efforts" method over the "full cost" method (73% vs. 27%) for providing more meaningful and yielding relatively greater comparability of annual reports of oil and gas producing companies. Most important reasons for justifying this position were two: (1) losses from unsuccessful ventures are currently reflected in annual reports prepared under "successful efforts" method, and (2) "full cost" method inappropriately inflates current income.

The questionnaire results indicated that the financial analysts favored "cash flow" (net income after adding back expenses which required no outlay of cash) for comparability and projections over net income reported under "successful efforts" or "full cost" methods. Apparently, this can be explained by the lack of comparability resulting from using a variety of accounting policies for finding costs of oil and gas without sufficient disclosures. For improving financial reporting of finding costs, the financial analysts recommended the inclusion of the following information in the published financial statements:

1. current expenditures on finding activities

2. amount currently expensed for costs of unsuccessful ventures
3. details of computing current amortization of capitalized finding costs
4. value of recoverable reserves at fair market value or at future net revenues discounted to present value
5. value of recoverable reserves on a country-by-country basis
6. deferred income tax for differences between book and tax treatment of finding costs.

Uniformity under "successful efforts" method was highly recommended by the financial analysts, whereas such uniformity under "full cost" method was rejected. Although the respondents strongly favored a uniform "successful efforts" method, they also favored a "Uniform Minimum Disclosure" statement under a uniform "successful efforts" method. This recommendation indicated that they need some kind of minimum uniformity for the purpose of obtaining comparable financial statements.

The examination of current annual reports of oil and gas companies, whose major activity was exploring for and producing oil and gas, revealed that both the two methods were equally popular among such companies. The variety of practices under each of the twc methods makes sufficient comparability of financial statements of such companies close to impossible. It was found also that all the information

recommended by oil and gas financial analysts for inclusion in the annual reports, except for current expenditures on finding activities, were not sufficiently disclosed.

According to the exploratory study made on the predictive ability of the two methods, the analysis tended to suggest that the "full cost" method provides greater predictive power when dealing with earnings per share and rate of return on total assets. However, the "cash flow" under "successful efforts" method provided the greatest predictive power of all. It has been indicated, however, that these conclusions were tentative and suggestive of further research because of the small number of companies used in this exploratory study. This limitation resulted from the fact that few oil and gas producing companies published a retroactive effect of shifting to another method of reporting finding costs. Results of the questionnaire conducted in this study to oil and gas financial analysts indicated the same results in terms of predicting "cash flow." In terms of predicting earnings per share and rate of return on total assets the difference between Yes or No responses was not statistically significant, at 0.05 level of significance. However, 59% of the respondents considered that financial statement prepared under "full cost" method is more reliable in predicting earnings per share. Such percentage was statistically significant at the 0.10 level of significance. But it was a worthwhile

to notice that most of the respondents who favored "full cost" method for predicting earnings per share favored the "successful efforts" method in general. This can only be explained by the fact that respondents believed that such a merit is more than offset by the disadvantages of the "full cost" method.

The predictive power of the "full cost" method in terms of earnings per share stems from the smoothing effect of this method on reported net income. Such effect is a normal result of capitalizing such finding losses as dry hole expenses and amortizing them over a long period. The limitation of the smoothing approach was best indicated in the statement of Paton and Littleton:

> A sharp distinction is to be drawn between a reasonable scheme of spreading an annual charge in short-term, interim reports and any policy of income calculation designed to bring about an artificial smoothing of fluctuations resulting from varying business fortunes over a period of years.[1]

The main argument of the full-costers is that the cost of unsuccessful ventures is necessary for finding the company's reservoirs. Based on this assumption, they argue that such costs are assets, i.e., producing future revenues. However, this argument gives rise to an important question: what would happen if current ventures did not result in new discoveries? It is unrealistic to believe that such unsuccessful ventures are producing future revenues from the reservoirs which have already been discovered in the past. Apparently, the "full cost" method

as it is practiced now cannot be accepted without changing the basics of accounting.

Recommendations

The significance of the investor's point of view suggests that the findings of this study be considered by the Financial Accounting Standards Board (FASB) of the American Institute of Certified Public Accountants before finalizing its position towards the accounting method accepted for handling finding costs of oil and gas. Of particular importance are such findings as that oil and gas financial analysts favored "successful efforts" method over "full cost" method, and their recommendations concerning the disclosure of additional information or the uniformity of accounting treatment of finding costs. It is also recommended that future research studies be made on the predictive ability of the "successful efforts" method and the "full cost" method. Such studies can be made when more companies disclose comparable results under each of these methods. Probably enough data will be available when more oil and gas producing companies publish the retroactive effect of shifting from one method to another.

The uniformity recommended by oil and gas financial analysts, as stated in the questionnaire responses, was of primary interest. A uniform "successful efforts" method or a "Uniform Minimum Disclosure" (UMD) statement under the same method was recommended. Probably a uniform

"successful efforts" method would not be acceptable by the preparers of financial statement. However, a UMD statement under "successful efforts" method would rather be more acceptable. The idea of UMD statement is by no means a new one. It has been proposed in 1968 by Dr. Homer A. Brown, Jr., Professor of Accounting at the University of Oklahoma.[2] In this statement, a single standardized "successful efforts" method of reporting for uniform minimum disclosure purposes is required. The reporting unit can continue to use, in its primary statements, any generally accepted methods under successful efforts costing or full costing whichever is believed to be more meaningful. Once the Financial Accounting Standards Board determined a standardized "successful efforts" method, it remains that a "Uniform Minimum Disclosure" statement be required in financial reporting. Normally, such a standardized method should be reviewed periodically. Thus, the suggested uniformity maintains the merits of both uniformity and flexibility.

Chapter VI Footnotes

[1]W. A. Paton and A. C. Littleton, An Introduction to Corporate Accounting Standards (Evanston, Illinois: American Accounting Association, 1940), p. 65.

[2]Homer A. Brown, Jr., "Financial Statements for External Analysts: An Evaluation and a Proposal," unpublished doctoral dissertation submitted to the Graduate School of Business of Indiana University, 1968, pp. 156-179.

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APPENDIX A

SPECIMEN LETTERS AND QUESTIONNAIRE

LIST OF EXHIBITS

Exhibit		Page
1.	Letter Request to Oil & Gas Financial Analysts Mailed with the Questionnaire . . .	
2.	Follow-up Letter Request to Oil & Gas Financial Analysts	
3.	Letter to Oil and Gas Producing Companies for Sending Their Annual Reports . .	
4.	Follow-up Letter to Oil and Gas Producing Companies	
5.	Questionnaire Mailed to Oil & Gas Financial Analysts	

EXHIBIT 1

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

December 27, 1974

Dear Mr.

Currently, I am engaged in a research study on the evaluation of published annual reports of oil and gas producing companies prepared under the "successful efforts" and the "full cost" methods of accounting for finding costs. You are aware of the fact that the successful efforts method capitalizes only the costs of successful exploratory activities and currently expenses the costs of unsuccessful ones, whereas the full-cost method capitalizes both the productive and the nonproductive expenditures--as long as the total expenditures do not exceed the value of recoverable reservoirs--and amortizes them on an overall unit-of-production method over the aggregate reservoir. The selection of one of the two methods has a significant effect on reported net income, assets, and stockholders' equity especially for companies whose major activity is exploring for and producing oil or gas.

This study is mainly concerned with some questions as to which of the two methods best serves your needs for the purpose of financial analysis and what additional information might be published to improve the present financial reporting of finding costs for companies whose major activity is exploring for and producing oil and gas.

For your convenience, the attached questionnaire has been designed so that it will not take more than ten minutes to answer, and a self-addressed envelope is enclosed. Your additional comments are invited.

It is not necessary to place your name on the questionnaire. Please be assured that your answers will be held in the strictest confidence and will be used in aggregate totals.

Your prompt response would be most appreciated.

Sincerely yours,

A. Naggar

EXHIBIT 2

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

February 5, 1975

Mr. Roland Horton
Chase Manhattan Bank
1 Chase Manhattan Plaza
New York, New York 10015

Dear Mr. Horton:

Recently, I mailed to you a confidential questionnaire on reporting finding costs of oil and gas producing companies with my letter of December 27, 1974. Since it appears that the questionnaire may not have been received or may have been misplaced, I am enclosing another copy for your consideration.

Your answer to the questionnaire may help improve financial reporting of the oil and gas industry so that more meaningful data could be available for your analysis. Please take a few minutes now to complete and return the questionnaire in the enclosed addressed, stamped envelope.

Your prompt response would be most appreciated. If you have already responded, please disregard this request.

Sincerely yours,

A. Naggar

AN/lkb

Enclosure

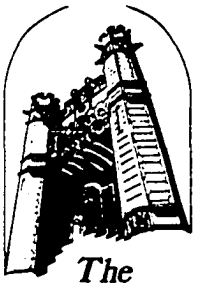

EXHIBIT 3

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

December 27, 1974

Dear Mr.

I am writing a dissertation for the Ph.D. degree in accounting at the University of Oklahoma on current practices of reporting finding costs of oil and gas. A major part of my dissertation involves a survey of these practices. Your company, being classified as an oil and gas producer, has been selected for the survey.

Please send me a copy of your published annual reports for the years from 1968 to 1973. I would be grateful if you send me also a copy of your 10-Ks for the same period.

Your prompt response would be most appreciated.

Sincerely yours,

A. Naggar

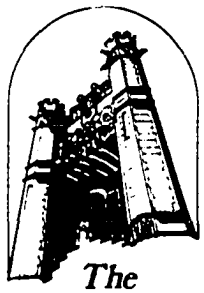

EXHIBIT 4

The University of Oklahoma 307 West Brooks, Room 200 Norman, Oklahoma 73069

Division of Accounting
College of Business Administration

February 3, 1975

Secretary
Northlode Exploration Ltd.
777 Hornby
Vancouver
British Columbia
Canada

Dear Sir/Madam:

I wrote you a letter on December 27, 1974, to send me a copy of your published annual reports and the 10-Ks for the years 1968 through 1973. Since it appears that the above letter may not have been received or may have been misplaced, I am again requesting that you send me a copy of these reports at your earliest convenience.

I wish to assure you that my study is not intended to be critical of your company. The data obtained from your annual reports will be used only in aggregate totals.

Receiving the above reports within the next two weeks would allow me to complete my dissertation on schedule. Your prompt response would be most appreciated.

Sincerely yours,

A. Naggar

A. Naggar

AN:cl

EXHIBIT 5

Division of Accounting — The University of Oklahoma

CONFIDENTIAL

QUESTIONNAIRE ON REPORTING FINDING COSTS OF OIL & GAS PRODUCING COMPANIES

Present employment: ☐ for a national firm ☐ for a regional firm ☐ local
Position: ☐ partner ☐ manager ☐ analyst ☐ other
Experience as analyst: ☐ 0-5 years ☐ 6-10 years ☐ over 10 years

I. COMPARABILITY OF ANNUAL REPORTS:

1. Which do you think is more meaningful and yields relatively greater comparability of the annual reports of oil & gas producing compaines:
   ☐ Successful efforts method (if checked skip question #3)
   ☐ Full-cost method (if checked skip question #2)

2. If you preferred successful efforts method, the reasons are:	YES	NO
a. it is consistent with traditional accounting	☐	☐
b. it improves matching of costs with related reserves	☐	☐
c. losses from unsuccessful ventures are currently reflected in the annual reports	☐	☐
d. full-cost method inappropriately inflates current income	☐	☐
e. other (specify)		

3. If you preferred full-cost method, the reasons are:		
a. results are not depressed by exploratory costs which are not related to current revenues	☐	☐
b. it improves matching of costs with related revenues because discoveries are unlikely without incurrence of unsuccessful ventures	☐	☐
c. when presented with changes of reservoirs, it permits ready comparison of comulative and current results of exploration programs	☐	☐
d. the balance sheet reflects actual costs of mineral reserves	☐	☐
e. it encourages exploration and development of reservoirs	☐	☐
f. other (specify)		

4. Because of the alternative accounting treatments for finding costs, cash flow (net income plus depreciation, depletion and amortization) is more reliable for comparability and predictions than net income reported under:		
a. successful efforts method	☐	☐
b. full-cost method	☐	☐

II. RELATIVE PREDICTIVE ABILITY:

5. Under which method would the annual reports of oil & gas producing companies be relatively more reliable for predicting:	Successful efforts method	Full-cost method
a. earnings per share	☐	☐
b. rate of return on total assets	☐	☐
c. returns to investor (dividends plus appreciation of stock)	☐	☐

III. RECOMMENDATIONS:

For the following two questions, circle the letter/s which indicate your answer.
SR=Strongly recommended R=Recommend U=Undecided
NP=Not particularly useful UN=Unnecessary

6. Which of the following information would you recommend for inclusion in the published annual reports of oil & gas producing companies:					
a. current expenditures on finding activities	SR	R	U	NP	UN
b. amount currently expensed for costs of unsuccessful ventures	SR	R	U	NP	UN
c. details of computing current amortization of capitalized finding costs	SR	R	U	NP	UN
d. value of recoverable reserves based on:					
1. fair market value	SR	R	U	NP	UN
2. future net revenues discounted to present value	SR	R	U	NP	UN
3. future net revenues without discount	SR	R	U	NP	UN
e. value of recoverable reserves on a country-by-country basis	SR	R	U	NP	UN
f. deferred income tax for differences between book and tax treatment of finding costs	SR	R	U	NP	UN

7. For improving present financial reporting of oil & gas producing companies, which of the following methods would you recommend:					
a. a uniform successful efforts method	SR	R	U	NP	UN
b. a uniform full-cost method	SR	R	U	NP	UN
c. a "uniform minimum disclosure" statement by which a column is added for data computed according to a uniform successful efforts method	SR	R	U	NP	UN
d. a "uniform minimum disclosure" statement by which a column is added for data computed according to a uniform full-cost method	SR	R	U	NP	UN

APPENDIX B

RESULTS OF THE QUESTIONNAIRE

LIST OF EXHIBITS

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3.	Opinion of Oil & Gas Financial Analysts on Comparability and Predictive Ability of "Successful Efforts" and "Full Cost" Methods--Total Responses	
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7.	Opinion of Oil & Gas Financial Analysts on Comparability and Predictive Ability of "Successful Efforts" and "Full Cost" Methods--Classified by Present Employment . .	
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9.	Opinion of Oil & Gas Financial Analysts on Comparability and Predictive Ability of "Successful Efforts" and "Full Cost" Methods--Classified by Position	
10.	Recommendations of Oil & Gas Financial Analysts--Classified by Position	
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Exhibit Page

12. Recommendations of Oil & Gas Financial Analysts--Classified by Period of Experience . . . . . .

EXHIBIT 1

RELIABILITY TEST OF THE QUESTIONNAIRE

No.	Random #	Test No. 1	Test No. 2	Inconsistency
1.	231	S*	S**	None
2.	55	S	S	None
3.	148	S	S	None
4.	117	S	S	None
5.	70	S	S	None
6.	92	S	S	None
7.	259	S	S	None
8.	113	S	S	None
9.	160	S	S	None
10.	13	S	S	None
11.	252	S	S	None
12.	1	S	S	None
13.	6	S	S	None
14.	283	S	S	None
15.	111	S	S	None
16.	74	S	S	None
17.	97	S	S	None
18.	254	S	S	None
19.	189	S	S	None
20.	262	S	S	None
21.	184	S	S	None
22.	250	S	S	None
23.	206	S	S	None
24.	190	S	S	None
25.	51	S	S	None
26.	16	S	S	None
27.	268	S	S	None
28.	173	S	S	None
29.	232	S	S	None
30.	49	S	S	None

*S = Satisfactory. Respondent favored SE (question #1) and answered question #2, but did not answer question #3 as requested in the questionnaire; or favored FC and answered question #3, but did answer question #2.

**S = Satisfactory. Respondent favored SE in question #1, and recommended a uniform SE but did not recommend a uniform FC in question #7; or favored FC in question #1, and recommended a uniform FC but did not recommend a uniform SE in question #7.

EXHIBIT 2

CLASSIFICATION OF OIL AND GAS FINANCIAL ANALYSTS
WHO RESPONDED TO THE QUESTIONNAIRE

Classification By	# of Respondents	Total
Certification:		
Certified Financial Analyst	81	
Not Certified	229	310
Present Employment:		
Working for a National Firm	162	
Working for a Regional Firm	92	
Working for a Local Firm	54	
Employment Not Indicated	2	310
Position:		
Partner	43	
Manager	48	
Analyst	141	
Other	31	
Position Not Indicated	47	310
Experience:		
Over 10 Years	156	
6-10 Years	77	
0-5 Years	40	
Period Not Indicated	37	310

EXHIBIT 3

OPINION OF OIL & GAS FINANCIAL ANALYSTS ON COMPARABILITY AND PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS (SE) AND FULL COST (FC) METHODS (TOTAL RESPONSES)*

Quest. #	Item	# of Respondents Yes	No
	Comparability of Annual Reports		
1.	Annual Reports Are More Meaningful and Comparable Under:		
	Successful Efforts Method	221	--
	Full Cost Method	83	--
2.	Reasons for Preferring SE Method:		
	a. Consistency with Traditional Accounting	129	29
	b. Improving Matching Costs with Reserves	138	35
	c. Currently Reflecting Losses from Unsuccessful Ventures	195	8
	d. Full Cost Method Inappropriately Inflates Current Income	183	14
3.	Reasons for Preferring FC Method:		
	a. Results not Depressed by Exploratory Costs	59	7
	b. Improving Matching Costs with Revenues	75	5
	c. Permitting Ready Comparison of Cumulative and Current Results of Exploration Programs	39	13
	d. Reflecting Actual Costs of Reserves	48	16
	e. Encouraging Exploration and Development	33	26
4.	"Cash Flow" is More Reliable Than Net Income Reported Under:		
	a. Successful Efforts Method	162	61
	b. Full Cost Method	130	70
	Relative Predictive Ability		
5.	a. Earnings per Share Is More Predictable Under:		
	Successful Efforts Method	116	--
	Full Cost Method	165	--
	b. Rate of Return on Total Assets is More Predictable Under:		
	Successful Efforts Method	185	--
	Full Cost Method	121	--

*Includes responses of each question only.

EXHIBIT 4

RECOMMENDATIONS OF OIL & GAS FINANCIAL ANALYSTS
(TOTAL RESPONSES)*

Quest. #	Recommendation	# of Respondents** SR	R	U	NP	UN
6.	Items Recommended for Disclosure:					
	a. Current Expenditures on Finding Activities	235	66		1	1
	b. Amount Currently Expensed for Costs of Unsuccessful Ventures	227	66	5	2	3
	c. Details of Computing Current Amortization	159	96	15	14	9
	d. Value of Recoverable Reserves Based On:					
	1. Fair Market Value	79	104	20	24	38
	2. Future Net Revenue Discounted	92	75	35	28	46
	3. Future Net Revenue Without Discount	39	51	42	43	81
	e. Value of Recoverable Reserves on a Country-by-Country Basis	92	80	10	13	23
	f. Deferred Income Taxes	137	119	16	10	14
7.	Uniformity Recommended:					
	a. Uniform "Successful Efforts" Method	146	59	16	12	21
	b. Uniform "Full Cost" Method	45	46	21	35	59
	c. "Uniform Minimum Disclosure" Statement Under a Uniform "Successful Efforts" Method	81	64	32	11	29
	d. "Uniform Minimum Disclosure" Statement Under a Uniform "Full Cost" Method	50	46	33	29	46

*Includes responses of each question only.

**SR = Strongly recommended, R = Recommended, U = Undecided, NP = Not particularly useful, and UN = Unnecessary.

EXHIBIT 5

OPINION OF OIL & GAS FINANCIAL ANALYSTS ON COMPARABILITY AND PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS (SE) AND FULL COST (FC) METHODS (CLASSIFIED AS CFA AND NCFA)*

Question #	# of Respondents**			
	CFAs		NCFAs	
	Yes	No	Yes	No.
1. (favoring SE)	59	--	162	--
(favoring FC)	19	--	64	--
2-a.	38	9	91	20
b.	40	8	98	27
c.	53	2	142	6
d.	50	3	133	11
3-a.	15	1	44	6
b.	16	2	59	3
c.	6	5	33	8
d.	11	4	37	12
e.	10	4	23	22
4-a.	40	14	122	47
b.	31	18	99	52
5-a. (SE more predictable)	28	--	88	--
(FC more predictable)	43	--	122	--
b. (SE more predictable)	44	--	114	--
(FC more predictable)	28	--	93	--

*CFA = Certified Financial Analysts, and NCFA = Not certified.

**Includes only responses of each question.

EXHIBIT 6

RECOMMENDATIONS OF OIL & GAS FINANCIAL ANALYSTS
(CLASSIFIED AS CFA AND NCFA)*

Quest. #	# of Respondents**									
	CFAs					NCFAs				
	SR	R	U	NP	UN	SR	R	U	NP	UN
6a.	65	15	0	0	0	170	51	0	1	1
b.	59	18	3	0	0	168	48	2	2	3
c.	36	35	3	2	2	123	61	12	12	7
d-1.	17	3	5	2	5	62	71	15	22	33
2.	23	26	11	5	8	69	49	24	23	38
3.	10	15	13	6	19	29	36	29	37	62
e.	24	28	2	1	5	68	52	8	12	18
f.	37	36	4	1	2	100	83	12	9	12
7a.	45	11	4	3	4	101	48	11	9	17
b.	7	10	8	10	14	38	36	13	25	45
c.	20	20	10	2	3	61	44	22	9	26
d.	13	10	8	6	11	37	36	25	23	35

*CFA = Certified Financial Analyst, and NCFA = Not Certified.

**Includes only responses of each question. SR = Strongly recommended, R = Recommended, U = Undecided, NP = Not particularly useful, and U = Unnecessary.

EXHIBIT 7

OPINION OF OIL & GAS FINANCIAL ANALYSTS ON COMPARABILITY AND PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS (SE) AND FULL COST (FC) METHODS (CLASSIFIED BY PRESENT EMPLOYMENT)

Question #	# of Respondents* Working For: National Firms		Regional Firms		Local Firms	
	Yes	No	Yes	No	Yes	No
1. (favoring SE)	122	--	61	--	38	--
(favoring FC)	39	--	29	--	15	--
2a.	68	18	36	9	25	2
b.	71	22	38	9	29	4
c.	104	4	56	2	35	2
d.	105	5	49	5	29	4
3a.	27	3	19	3	13	1
b.	35	2	26	2	14	1
c.	15	8	15	1	9	4
d.	22	7	17	4	9	5
e.	13	15	13	4	7	7
4a.	81	38	50	12	31	11
b.	71	34	35	24	24	12
5a. (SE more predictable)	63	--	33	--	20	--
(FC more predictable)	83	--	51	--	31	--
b. (SE more predictable)	85	--	44	--	29	--
(FC more predictable)	60	--	39	--	22	--

*Includes only responses of each question.

EXHIBIT 8

RECOMMENDATIONS OF OIL & GAS FINANCIAL ANALYSTS
(CLASSIFIED BY PRESENT EMPLOYMENT)

Quest. #	# of Respondents* Working For: National Firm					Regional Firm					Local Firm				
	SR	R	U	NP	UN	SR	R	U	NP	UN	SR	R	U	NP	UN
6-a.	132	29	0	1	1	65	24	0	0	0	38	13	0	0	0
b.	130	30	1	1	1	58	27	1	0	2	39	9	2	1	0
c.	90	49	8	8	5	40	30	7	3	3	29	17	0	3	1
d.-1.	40	59	9	14	24	28	21	7	6	10	11	24	4	4	4
2.	50	37	15	17	26	29	22	13	18	10	13	16	7	3	10
3.	23	31	18	22	47	9	13	16	10	21	7	7	8	11	13
e.	46	46	5	6	12	23	20	3	4	7	23	14	2	3	4
f.	82	56	10	3	7	35	41	5	2	4	20	22	1	5	3
7-a.	85	27	9	4	10	34	19	7	5	6	27	13	0	3	5
b.	23	22	11	24	27	14	15	9	7	16	8	9	1	4	16
c.	42	39	15	3	18	26	12	14	3	3	13	13	3	5	8
d.	23	23	18	17	21	19	15	12	5	11	8	8	3	7	14

*Includes only responses of each question.

EXHIBIT 9

OPINION OF OIL & GAS FINANCIAL ANALYSTS ON COMPARABILITY AND PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS (SE) AND FULL COST (FC) METHODS (CLASSIFIED BY POSITION)

Quest. #	# of Respondents*							
	Partner		Manager		Analyst		Other	
	Yes	No	Yes	No	Yes	No	Yes	No
1. (favoring SE)	60	--	36	--	103	--	22	--
(favoring FC)	28	--	11	--	36	--	8	--
2-a.	32	6	20	5	63	14	14	4
b.	32	11	28	2	63	19	15	3
c.	55	1	33	2	87	5	20	0
d.	46	4	29	3	88	7	20	0
3-a.	20	3	9	1	26	3	4	0
b.	24	3	10	1	33	1	8	0
c.	14	4	6	1	17	7	2	1
d.	19	5	9	1	16	10	4	0
e.	9	8	6	4	16	12	2	2
4-a.	47	17	24	7	71	33	20	4
b.	35	24	18	11	68	28	9	7
5-a. (SE more predictable)	28	--	23	--	53	--	12	--
(FC more predictable)	52	--	22	--	75	--	16	--
b. (SE more predictable)	39	--	24	--	79	--	16	--
(FC more predictable)	41	--	20	--	48	--	12	--

*Includes only responses of each question.

EXHIBIT 10

RECOMMENDATIONS OF OIL & GAS FINANCIAL ANALYSTS (CLASSIFIED BY POSITION)

Quest. #	# of Respondents*																			
	Partners					Managers					Analysts					Others				
	SR	R	U	NP	UN	SR	R	U	NP	UN	SR	R	U	NP	UN	SR	R	U	NP	UN
6-a.	67	18	0	1	1	33	15	0	0	0	118	20	0	0	0	17	13	0	0	0
b.	61	21	1	1	2	33	13	2	0	0	115	21	1	1	0	18	11	1	0	1
c.	42	27	7	6	2	27	12	3	3	0	78	46	4	4	4	12	11	1	1	3
d.-1.	18	25	6	8	13	15	19	1	5	5	38	50	11	10	14	8	10	2	1	6
2.	27	18	12	17	15	15	15	4	5	6	40	37	15	16	18	10	5	4	0	7
3.	13	14	12	8	24	6	10	7	9	12	16	24	17	24	35	4	3	6	2	10
e.	28	19	3	2	7	13	15	1	4	4	44	34	4	6	10	7	12	2	1	2
f.	36	31	2	7	8	21	24	3	0	0	70	53	6	3	3	10	11	5	0	3
7-a.	40	15	2	6	10	24	9	3	3	3	66	30	8	2	7	16	5	4	1	1
b.	17	10	5	5	15	6	9	1	10	11	17	21	14	17	27	5	6	1	3	6
c.	20	17	8	5	10	15	11	10	1	3	39	29	11	5	13	7	7	3	0	3
d.	15	10	8	5	15	8	7	7	7	5	24	22	15	16	20	3	7	3	1	6

*Includes only respondents of each question. SR = Strongly recommend, R = Recommend, U = Undecided, NP = Not particularly useful, and UN = Unnecessary.

EXHIBIT 11

OPINION OF OIL & GAS FINANCIAL ANALYSTS ON COMPARABILITY AND PREDICTIVE ABILITY OF SUCCESSFUL EFFORTS (SE) AND FULL COST (FC) METHODS (CLASSIFIED BY PERIOD OF EXPERIENCE)

Question #	# of Respondents* with Years of Experience: 0-5 Yes	0-5 No	6-10 Yes	6-10 No	Over 10 Yes	Over 10 No
1. (favoring SE)	58	--	54	--	109	--
(favoring FC)	19	--	20	--	44	--
2-a.	30	12	38	7	61	10
b.	38	9	30	12	70	14
c.	50	2	48	2	97	4
d.	43	8	47	3	93	3
3-a.	14	0	17	2	28	5
b.	18	0	18	3	39	2
c.	6	3	11	5	22	5
d.	9	3	13	5	26	8
e.	6	3	8	8	19	15
4-a.	41	16	35	19	86	26
b.	31	18	41	17	58	35
5-a. (SE more predictable)	29	--	29	--	58	--
(FC more predictable)	42	--	44	--	79	--
b. (SE more predictable)	43	--	37	--	78	--
(FC more predictable)	27	--	34	--	60	--

*Includes only responses of each question.

EXHIBIT 12

RECOMMENDATION OF OIL & GAS FINANCIAL ANALYSTS
(CLASSIFIED BY PERIOD OF EXPERIENCE)

Quest. #	# of Respondents* with Years of Experience														
	0-5					6-10					Over 10				
	SR	R	U	NP	UN	SR	R	U	NP	UN	SR	R	U	NP	UN
6-a.	54	21	0	0	1	58	18	0	0	0	123	27	0	1	0
b.	51	21	1	0	3	56	19	1	0	0	120	26	3	2	0
c.	36	24	5	4	5	41	24	4	3	1	82	48	6	7	3
d.-1.	19	15	9	9	17	23	25	5	8	6	37	64	6	7	15
2.	19	14	13	9	18	28	19	10	6	7	45	42	12	13	21
3.	7	8	12	13	28	14	10	8	15	18	18	33	22	15	35
e.	17	22	2	2	11	23	17	3	3	3	52	41	5	8	9
f.	33	29	3	3	6	38	27	4	3	2	66	63	9	4	6
7-a.	38	15	2	6	3	33	16	6	1	9	75	28	8	5	9
b.	6	15	2	9	16	15	10	6	13	17	24	21	13	13	26
c.	23	11	4	5	8	18	19	10	3	9	40	34	18	3	12
d.	10	11	8	7	13	16	12	10	9	10	24	23	15	13	23

*Includes only responses of each question. SR = Strongly recommend, R = Recommend, U = Undecided, NP = Not particularly useful, and UN = Unnecessary

APPENDIX C

LIST OF OIL AND GAS PRODUCING COMPANIES
INCLUDED IN THE STUDY

1. Adobe Oil & Gas Corporation
2. Amarex, Inc.
3. American Eagle Petroleums, Ltd.
4. American Quasar Petroleum Co.
5. Apache Exploration Corp. (now Apexco, Inc.)
6. Argo Petroleum Corporation
7. Azamera Oil Corporation, Ltd.
8. Ashland Oil Canada Limited
9. Austral Oil Company Incorporated
10. Aztec Oil & Gas Company
11. Basin Petroleum Corp.
12. Belco Petroleum Corporation
13. Bell Western Corp.
14. Buttes Gas & Oil Co.
15. C&K Petroleum, Inc.
16. California Time Petroleum, Inc. (now Petrominerals Corporation)
17. Canada Southern Petroleum, Ltd.
18. Canadian Export Gas & Oil, Ltd.
19. Canadian Homestead Oils, Limited
20. Canadian Superior Oil, Ltd.
21. Can Del Oil Ltd.
22. Cayman Corporation
23. Clinton Oil Company
24. Consolidated Oil & Gas., Inc.
25. Coquina Oil Corporation
26. Cotton Petroleum Corporation
27. Damson Oil Corporation
28. Delhi International Oil Corporation
29. Dome Petroleum Limited
30. Dorchester Gas Corporation
31. Double Eagle Petroleum and Mining Company
32. Dowdle Oil Corporation
33. EMC Energies, Inc.
34. Eason Oil Company
35. Echo Oil Corporation
36. Equity Oil Company
37. Exchange Oil & Gas Corporation
38. Exeter Oil Company, Ltd.
39. Felmont Oil Corporation
40. Flying Diamond Corporation
41. Forest Oil Corporation
42. Galaxy Oil Company
43. General American Oil Company of Texas

44. General Exploration Company
45. Great Plains Development Company of Canada, Ltd.
46. Great Yellowstone Corporation
47. Gulf Energy & Development Corporation
48. Hamilton Brothers Exploration Company
49. Hanover Planning Company, Inc.
50. Helmet Petroleum Corporation
51. Hiko Bell Mining and Oil Company
52. Houston Oil & Minerals Corporation
54. Hudson's Bay Oil and Gas Company Limited
55. Inexo Oil Company
56. Inter-American Petroleum Corporation
57. Intercontinental Energy Corporation
58. International Royalty & Oil Co.
59. Invent Incorporated
60. Juniper Petroleum Corporation
61. King Resources Company
62. LVO Corporation
63. Ladd Petroleum Corporation
64. The Louisiana Land and Exploration Company
65. Louisiana Land Offshore Exploration Company, Inc.
66. Love Petroleum Company
67. May Petroleum, Inc.
68. Maynard Oil Company
69. McCulloch Oil Corporation
70. Merchants Petroleum Company
71. Miller Oil Company
72. Mitchell Energy & Development Corp.
73. Norris Oil Co.
74. North Canadian Oils Limited
75. Northwest Production Corporation
76. Numac Oil & Gas, Ltd.
77. Ocean Oil & Gas Company
78. Oceanic Exploration Company
79. Pacific Oil and Gas Development Corporation
80. Page Petroleum, Ltd.
81. Pan Ocean Oil Corporation
82. Pauley Petroleum, Inc.
83. Pennzoil Louisiana and Texas Offshore, Inc.
84. Pennzoil Offshore Gas Operators, Inc.
85. Peruvian Oils & Minerals, Ltd. (now Pominex, Ltd.)
86. Petrol Industries, Inc.
87. Petro-Lewis Corporation
88. Plaza Petroleum, Inc. (now Brock Exploration Corporation)
89. Prairie Oil Royalties Company, Ltd.
90. Sage Oil Company, Inc.
92. Scurry-Rainbow Oil, Limited
93. Seaboard Oil & Gas Co.
94. Shenandoah Oil Corporation
95. Skyline Oil Company
96. Southland Royalty Company
97. State Exploration Company
98. Summit Energy, Inc.

99. The Superior Oil Company
100. Tenneco Offshore Company, Inc.
101. Terra Resources, Inc.
102. Texas American Oil Corporation
103. Texas International Company
104. Texas Oil & Gas Corp.
105. Tipperary Corporation
106. Trans-Ocean Oil, Inc.
107. Tribune Oil Corporation
108. Triton Oil & Gas Corp.
109. United Canso Oil & Gas, Ltd.
110. Universal Resources Corporation
111. Webb Resources, Inc.
112. Western Decalta Petroleum Limited
113. White Shield Corporation
114. Willard Pease Oil & Gas Company
115. The Wiser Oil Company