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COST ACCOUNTING REGULATIONS IN  
OIL AND GAS INDUSTRIES

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Abstract

The cost accounting methods that are currently used in the oil and gas industry are very diverse. Since the 1973 Arab Oil Embargo, increased attention was given to this issue, which resulted in the issuance of SFAS-19 by the FASB and the SEC's attempt to develop a new accounting method based on the value of their reserves. The pros and cons of the existing methods are discussed. Also discussed is the need for a uniform accounting procedure.

1. INTRODUCTION

Since the 1973 Arab Oil Embargo, the United States has continuously increased its attention towards the oil and gas industries. This is reflected in the passage of the Energy Conservation Act of 1975, which in part states "for purposes of developing a reliable energy data base related to the production of crude oil and natural gas, the Securities and Exchange Commission should take steps as may be necessary to assure the development and observance of accounting practices to be followed in the preparation of accounts ..." (10) After many months of research, public hearings, the Financial Accounting Standards Board issued SFAS (Statement of Financial Accounting Standards) No. 19 in December 1977. (5) It established the standards of financial accounting and reporting for the oil and gas producing activities of a business enterprise.

Before the issuance of SFAS No. 19, the oil and gas producing companies were following numerous alternative accounting practices. The nature and extent of the information disclosed in their financial statements about their oil and gas producing activities varied considerably from company to company.

The problem of financial accounting, cost accounting and reporting by oil and gas producing has been debated for many years, and is still being debated in the United States by the accounting profession, regulatory agencies, industry groups and oil and gas companies.

Of the many issues related to oil and gas accounting, the accounting for the cost of minerals received most attention. SFAS No. 19 requires the oil and gas producing companies to follow the successful efforts costing method as the cost accounting method for minerals.

Many questions were raised about this choice. Mainly the small independent companies expressed their fears about reduction in their reported net income, high fluctuations in income, and doubts about their ability to attract capital. They claim that the adoption of the successful efforts method will hurt the exploration activities and will be against the economic goals of the country, and to be self-sufficient in oil by cutting oil imports.

2. MAJOR VALUATION PROCEDURES

Before issuing SFAS No. 19, the FASB considered four different costing methods. (4) They are: (1) full costing, (2) successful efforts costing, (3) discovery value accounting and (4) current value accounting. Of these four methods the first two are based on historic cost concept and the latter two are based on current value concept.

2.1 FULL COSTING

Under the full costing concept, all costs incurred in acquiring, exploring and developing the properties within a large cost center are capitalized irrespective of the success or failure of discovering oil. These costs are amortized as mineral reserves in the cost center, are extracted and sold subject to a limitation that the capitalized costs do not exceed the value of the reserves. The overall objective of discovering oil and gas becomes more important than the success or failure of each individual property. The application of the full costing method varies depending upon the cost center, the amortization base, and the valuation used to obtain the capitalization limit. But, no matter what variations of full costing are used, it fails to match the costs and revenues as the costs of acquiring, exploring and developing of both successful and unsuccessful projects are pooled and capitalized.

When unrelated costs like drilling costs in Alaska are combined with revenues generated from the Gulf, the readers fail to get a clear picture of the risks and returns of oil exploring industry.

## 2.2 SUCCESSFUL EFFORTS COSTING

The successful efforts costing method is based on direct relationship between the costs incurred and the specific reserves discovered. The costs of acquiring, exploring and developing are capitalized only if the related properties are proved to have mineral reserves. These costs are amortized as the reserves underlying these properties are produced. For other projects, the costs are capitalized as for an asset until a determination of failure is made. Once this determination is made the costs will be expensed. The successful efforts cost concept is based on the direct results of expenditures of each cost center and tries to highlight the risks, uncertainties and rewards of oil and gas exploring activities.

## 2.3 DISCOVERY VALUE ACCOUNTING

Discovery of minerals is the most important phase in the oil and exploration activities. So, under the discovery value accounting concept, the mineral reserves would be recorded at their estimated value at the time of discovery or at the time of development. This discovery value will be treated as revenue from oil and gas exploration activities of the company and later amortized against the revenues generated from the production and sales of the minerals. The major difficulty with the concept of discovery value accounting is the determination of the value of the oil and gas reserves. But discovery value accounting provides better match of revenues and expenses than the other costing methods.

## 2.4 CURRENT VALUE ACCOUNTING

The value of oil and gas reserves is constantly increasing as the worldwide inflation and demand for oil and gas are increasing. There is a considerable lag between the acquisition, exploration, development and sale of the minerals. With rapidly changing prices, the historic values attached to these reserves may become meaningless. The current value concept tries to value the oil and gas reserves using the most current information available at the date of financial statements. Under this concept separate data may be provided for the financial statement users about the changes in the value of the reserves because of (1) new discoveries, (2) adjustment of reserve quantities and (3) holding gains and losses reflecting the change in unit value. But the current value accounting method is criticized for the lack of objectivity and the difficulty in estimating the reserves.

## 3. WHY SUCCESSFUL EFFORTS COSTING?

All the four costing methods described above have both strengths and limitations. Both the discovery value accounting and current value accounting methods are criticized for their subjective valuation techniques, and the difficulty in measuring the value of reserves with reasonable accuracy at the point of discovery. Discovery value method requires the estimates of (1) quantity of reserves, (2) the timing of production of these

reserves, (3) the production costs, (4) the selling price and (5) income taxes. These estimates can be further complicated by the government (domestic and foreign) regulations and restrictions, changes in technology, and changes in economics. The generally accepted accounting principles state that revenue is normally recognized at the time of sale or when the earnings process is virtually complete and the sales transaction takes place. The current value accounting is in contradiction with the generally accepted accounting principles and it is also based on estimates which are subject to the same uncertainties as the discovery value method.

The generally accepted accounting principles stress the importance of matching the costs and revenues of the period in arriving at the net income for the period. The concept of full costing is not consistent with the accounting framework, as costs are capitalized irrespective of the success of the project. Further, full costing aggregates all oil and gas reserves within a very broad cost center into a single asset irrespective of where and when they are discovered. All the acquisition, exploration and development costs of this cost center will be considered as the cost of these reserves.

Under the full costing method, the risk of unsuccessful projects is camouflaged by mixing the costs of unsuccessful with successful projects. The capital suppliers like to receive higher returns if the risk is high. The variability of earnings, which is a measure of risk, is reduced by capitalizing all costs and later amortizing. Though there is the limitation on the amount that can be capitalized, with today's inflation and increase in oil and gas prices the value of the reserve ceiling becomes meaningless. (7)

Under the successful efforts costing method, the boundaries of the assets to be accounted for are not as wide as under the full costing method. The costs of exploration and development are capitalized only if they are directly related to specific oil and gas reserves. The variability and hence the risks involved in the exploration and development of oil and gas are shown more clearly than in the full cost method. The successful efforts method highlights failures and risks involved in searching for oil and gas reserves by expensing the costs that result in an unsuccessful project as these costs are deemed to have no future identifiable benefits.

The FASB selected the successful efforts method as the accounting procedure that should be applied in accounting for oil and gas. The SEC announced in September 1977 that it would go along with the FASB's decision. However, it now says that this was a substantive comment designed merely to comply with the Energy and Conservation Act deadline. Subsequently, the SEC held hearings and came to the conclusion that the oil and gas companies need a new accounting procedure for the costing purposes. This new accounting method will be based on the value of their reserves and is expected to be developed in about three years.

The main objections raised against the acceptance of successful efforts method are: the ability to raise capital, the possible impact on the oil and gas exploration activities of the oil and gas producing companies, and the ability to meet the national economic goal of increasing the production

of oil and gas. Both the Federal Trade Commission and the Energy Department had opposed the Financial Accounting Standards Board's ruling, saying it could hurt the independent oil companies and reduce the competition in the industry.<sup>(9)</sup>

#### 4. POSSIBLE IMPACT OF SUCCESSFUL EFFORTS COSTING ON CAPITAL RAISING AND EXPLORATION ACTIVITIES

##### 4.1 ABILITY TO RAISE CAPITAL

The Energy Conservation Act of 1975 states that we need a reliable data base related to the production of crude oil and natural gas. One of the most important economic goals of the country is to reduce the dependency on imports and to increase the exploration for more oil and gas. This can be achieved only by creating sufficient incentives to the oil and gas industry for further exploration.

The proponents of the full costing method state that the application of the full costing method improves their ability to raise capital. They also claim that the elimination of the full cost accounting approach would virtually destroy the exploration activities of the small companies, since it would force them to charge to the earnings much of the capital (related to unsuccessful projects) they are investing to find new assets.<sup>(2)</sup> They further say that "all costs incurred relate to the total mineral reserves discovered, and produced without limitation as to lease, field, or other geographical boundaries."<sup>(8)</sup>

The opponents of the full cost method say that "the capitalization of both unsuccessful and successful expenditures in the area would tend to obscure comparison of relative success of different companies in finding minerals."<sup>(3)</sup>

The ability to raise capital depends upon numerous factors like risk, earnings, dividends, growth, and cash flows. The stock market takes into consideration the application of different accounting principles. It can see through the accounting differences and feel the economic realities beneath. Empirical studies have come to the conclusion that the application of the successful efforts method and the full costing method are not significantly different in terms of the market risk and stock prices.<sup>(2)</sup> In his study, Askew compared eighteen companies that have changed from the full costing method to the successful costing method and twenty-five companies that continued with the successful efforts costing method. His conclusions are "(1) that the difference between earnings/price variability is not significant, (2) that the accounting risk measures like payout ratio, asset growth, leverage, liquidity, asset size, earnings variability, earnings convertability for the successful efforts method sample are more highly associated with the market risk measure compared to any of these accounting risk measures for full cost sample."

The results of this empirical study indicate (1) the hypothesis that the market appears to respond naively to the accounting data should be rejected and (2) the accounting alternatives adopted by a firm does not appear to have the capability of affecting the security returns. Similar views are expressed by many, and in particular, Horngren, who said, "the change to successful

efforts method has no effect on the company's cash flows, income tax payments, valuation of oil and gas reserves, cost of exploration, oil and gas pricing or risks and rewards when a well is drilled."<sup>(6)</sup>

Financial statements are only one source of information about the position and prospects of a firm and reported earnings do not always have very powerful influence on the stock prices. Further it is hard to believe that managers decide to reject an economically justifiable activity because a switch from full cost to successful efforts cost is made while the prices, risk, cash flows, taxes are all unaffected by the accounting method. Such a decision, if made will be a highly questionable action and is not in the best interest of the stockholders of the company.

The investment merits of the securities of the exploratory oil and gas producing company stem from the value of its mineral reserves and changes therein. If the value of the minerals increase and if they are disclosed, the value of the company also increases regardless of whether the company uses the full cost or successful efforts costing. In addition, the successful efforts costing gives investors a more accurate picture of oil and gas reserves. It eliminates the inequities faced by other industries as they compete for capital with oil and gas companies.

##### 4.2 IMPACT ON EXPLORATION

Exploration for oil and gas depends on several factors other than the availability of capital. The exploration activities and the capital spending patterns in general depend upon the government regulations, the expected future demand, the prices, various concerns about oversupply, the accessibility of new acreage, etc. Jeffrey R. Freedman, Smith Barney analyst believes that "the long-term cause for oil-related spending remains strong but he expects surplus capacity and the weakness in the "real", or inflation-adjusted, price of oil to last two or three years and says this won't be conducive to extending the relatively high rates of spending of recent years."<sup>(1)</sup>

## 5. CONCLUSIONS

The future energy planning depends heavily on the data provided by the oil and gas industry about its revenues, costs, profits, cash flows, number of explorations, and the average rate of success. Uniform accounting procedures are essential to develop a data base for the oil and gas industry. The claim that the adoption of the successful efforts costing method will hurt the small exploration companies is meaningless as it suggests that these small explorers can only obtain capital by misleading the investors.

The SEC believes that the information provided under the new proposed method would be more accurate and more useful to investors than the information provided by the existing methods. It also believes that the new method would provide the information on energy production as the Congress wanted in 1975, when it asked the SEC to take steps to develop uniform accounting practices for the industry.

It is uncertain at this time what form the new method will take and how it will be received by the oil and gas industry. According to the SEC it

may take about three years to develop the new accounting procedure. The inherent imprecision of reserve valuation makes the feasibility of the proposed method doubtful, says the SEC chairman Harold Williams. As a result, he says "the ultimate method of reporting is not yet determinable." (9)

So, where do we stand now? What did we accomplish in the past three years since the Congress requested a uniform accounting method for oil and gas industry? It seems that we moved along a full circle and came back to the exact same point where we started. After years of research work by the accounting profession, numerous public hearings, we still have no uniform accounting procedure for oil and gas industry.

Accounting methods should not be designed to satisfy any specific economic response. If the national goal is to increase the exploration for oil and gas by providing cheaper and more readily available capital, it should be done by providing proper incentives either by the Congress or the President.

In the long run, the uniform application of the successful efforts costing, the authors believe, will foster better competition, better public understanding, better data base and better energy planning.

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#### 7. BIOGRAPHIES

Dr. Lakshmi U. Tatikonda is currently Associate Professor of Accountancy at the University of Wisconsin--Oshkosh. Her interests extend beyond Accountancy into Decision Sciences and several areas of Energy Management dealing with Energy Accounting and Finance. She taught at the University of Florida--Gainesville, University of New Orleans, Nicholls State University at Thibodaux and Eastern Illinois University in Charleston before joining the University of Wisconsin--Oshkosh. The courses taught were in Mathematics, Statistics, Operations Research and Accountancy. Her degrees include Ph.D. in Statistics and Operations Research from the University of Texas--Austin, M.Sc., M.B.A., and B.A. She also passed the C.P.A. and C.M.A. examinations, receiving a Certificate of Distinguished Performance in the latter.

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