



Factors Beyond the Engineering Evaluation That Affect Fair-Market Values

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Abstract

For many years fair-market-value determinations for oil properties were based on well established criteria of reserves and projected future revenues indicated by engineering analyses. Recently, prices paid for such properties have been higher than those calculated by these methods. Various factors not encompassed by the engineering appraisal affect these prices, including finding costs, refinery needs, refining and marketing profits, geographic location of properties, tax position of purchaser, rate of return sought, purchases by groups, management philosophy, type of purchase, incentive to investors and bid sales. Although the engineer appraiser may have no control over these factors, he should be aware of how they may influence the profit stream as calculated in the engineering analysis.

Introduction

Methods of estimating oil and gas reserves and their probable future revenue are fairly consistent throughout the petroleum engineering profession. Methods of determining the fair-market value of these reserves may vary, however, depending on the appraiser's, owner's, or purchaser's viewpoint. The outside appraiser-at-large may have access to all the available engineering data but may not be familiar with factors outside the engineering which can affect the value a purchaser would put on a property. Pride of ownership may cause the owner to put a premium on his sale price, but he also may not be aware of specific influences which affect the prospective purchaser's valuation. Within a prospective purchasing company, certain conditions or information may exist which make a property more or less valuable to them than to others. Certainly, on any property there are just so many units of hydrocarbons, regardless of who owns or acquires the property. However, there may be a wide difference in the manner and amount of reserves recovered and utilized to obtain the optimum profit. The purpose of this paper is to examine certain factors which influence values but which are usually outside the direct engineering appraisal.

The engineering appraiser must keep abreast of constantly changing prices, costs, allowables, producing and finding techniques, markets and many other related factors.

He must weigh these factors in light of the current situation and the possible future situations. The appraisers' tools are certain formulas and principles which are applied to the data. As in other types of appraisals, the oil valuator must use all the methods and approaches available on a specific problem; he should then weigh the different results before arriving at an answer. His judgment must be relied upon heavily in the final analysis.

For many years fair-market-value determination has been based on a rather well defined analysis of the reserves and projected revenues derived from a detailed engineering evaluation. The purchases were usually negotiated at prices within range of the results of the engineering analysis. In some cases, however, the prices paid for properties have been in excess of any value that can be arrived at by applying the historic methods and yardsticks to the engineering data. It is evident that several factors outside the direct engineering analysis have been given stronger emphasis by the prospective purchasers. Some of the factors are due to the size, nature, make-up and character of the purchaser; others are due to the current economic, industry or money-market climates. The following paragraphs examine some of these factors which appear to be influencing market values.

Increased Finding Cost

An important factor that is putting a premium on reserve purchases is the increasing cost of finding and developing crude-oil or natural-gas reserves. These costs have increased to such an extent that buyers, in many instances, are finding it cheaper to buy than to develop reserves. A recent study by Hodges and Steele¹ states: "The data all seem to support the hypothesis that the phenomenon of diminishing returns to exploratory drilling is being experienced with increasing severity from year to year, and has been operating more severely since about 1937-1939, the period of the lowest per-well and per-foot real cost of discovery". Farrier² says the following. "In the past few years, an additional stimulus to purchasing developed reserves was the discovery by many companies that they were experiencing fairly substantial annual increases in the cost of finding and developing their own crude oil and natural gas reserves. As a result, many companies sought opportunities to buy reserves at prices below their then

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¹References given at end of paper.

current and anticipated exploratory and development costs.”

Certainly there is less risk in buying reserves than in attempting to explore and develop them; even in a bad purchase there are some residual values remaining. The determination of the over-all average oil-industry finding cost is very complicated, and various studies have arrived at widely divergent answers. One thing is clear, however—the trend in finding costs is definitely upward. Finding cost as shown, by Hodges and Steele,¹ was approximately \$1.41 for each new barrel-equivalent of oil discovered in 1955. Later studies have shown this cost to be in the neighborhood of \$1.60 to \$1.80/bbl. A company that has an opportunity to purchase reserves at a price under its own finding cost, or the industry-average finding cost, is bound to find the prospect attractive. The prices being asked for purchased reserves have not risen in the same magnitude as the finding costs. The variation in the historical finding cost, between different companies, may cause one company to pay more for reserves than another company.

Refinery Needs

Those integrated oil companies which are refiners-on-balance (i.e., have a larger refining than producing capacity) are continually striving to increase their crude production capacity to afford better control of their raw material. The purchased properties may offer an opportunity to effect a crude swap which will benefit their crude stream. If production from properties offered for sale can be readily utilized by a particular refiner-on-balance, that company may be willing to offer a higher price than another not in this position.

Profits from Operating Phases Other Than Producing

Integrated companies—who have complete producing, refining, transportation and marketing facilities—have a profit potential from each of their integrated phases, and this aggregate profit may be a strong influence in their purchase consideration. Bicks² states that a rough correlation shows that integrated companies, who own a higher proportion of their production, show a proportionately higher over-all profit. Of course, this may be due in part to the higher profit potential from the producing phase and in part due to an understatement of the true value of the producing assets. Additional properties may allow the refiners to get better use from existing facilities and, in some cases, may permit them to make a profit on some facility now on a marginal basis. It has long been recognized that³ a property may have a “double value” to a purchaser who produces oil in addition to refining and marketing it. In the present surplus situation, some companies view the refining and marketing phases as a burden they must assume to assure outlets for crude. Historically, the profit from refining and marketing has often been important in relation to the producing profits. Frequently, the value for these two phases is more important than that for the producing phase.

Geographic Location of Properties

Production Integration

The geographical location of the production offered for sale may influence one possible buyer to offer a higher or lower price than some other possible purchaser. The purchased properties may fit into the buyer's existing production spread and offer him substantial savings in decreased

overhead costs, in relation to the amount of oil produced, from any particular area. The buyer may also be able to operate the properties at a cost substantially less than the present owner because he is adding only incremental costs to existing field office and personnel costs. In some specific cases, where a buyer is able to secure a larger interest in the same field, he may be able to increase ultimate oil recovery by having better control of the reservoir.

Marketing, Gathering and Refining Integration

If the purchaser has marketing, gathering and refining facilities in the general area, he would be able to get a better system distribution of crude and products and, consequently, better control of the market in that area. Also, the quality or characteristic of a crude oil in some areas may be attractive; perhaps the potential buyer has a need for a certain type of crude oil in this particular area to balance out his refining and marketing facilities.

Field Crude Oil or Gas Outlet Control

A company may have a decided advantage in a specific area where it is in a position to exert some control on the local oil or gas outlet at the field level. It may have direct pipeline connections to some of the properties being considered; and, in states where there is no proration, it is able to increase the oil or gas rates substantially because of its control of the outlet. Consequently, in arriving at the fair-market value, this company is able to project higher profits in early years than a purchaser who must be content with the existing production rate on a specific property.

Geological and Exploratory Information

The amount of geological information available within different companies may vary widely because some companies tend to concentrate their exploratory efforts in specific geological provinces. If the properties offered for purchase are in a limited area, naturally the company whose exploratory efforts are concentrated in the same area would have decided advantages in appraising the non-producing leases. An appraisal within the company normally includes geological data on nonproducing leases in their final analysis; an appraiser-at-large, however, (not being privileged to this geological information) may not give any, or adequate, value to the nonproducing leases.

Tax Position of Purchaser

The current tax position of a purchaser might influence him to pay a property purchase price higher than normal if he has a considerable tax loss carry-forward which may be lost in the near future. By purchasing income through a property acquisition, he may be able to realize a substantial tax saving through his being able to offset a tax loss carry-forward by cash income which is thereby rendered effectively nontaxable. A purchaser whose tax posture has historically been such that he has paid little or no income taxes can project higher after-tax profits than a company whose proportion of tax-deductible expenditures is less. Production-emphasis companies, because of their higher proportion of exploratory and development drilling, usually have proportionately larger tax deductibles.

Rate of Return Sought

Purchasers whose cost of capital is historically low may seek a lower rate of return than one who is burdened with a higher cost of capital. Corporations who are active in the oil property purchase field apparently seek a rate of return, by discounted cash flow, varying from 12 to 20 per

cent on an after-tax-basis. But calculations indicate that many of them are willing to pay a price which would result in a rate of return of 12 to 13 per cent. Consequently, those who aim at an 18 to 20 per cent rate of return will arrive at a lower fair-market value than those seeking the 12 to 13 per cent rate, other factors being equal.

Purchasers' Tendency to Disregard the Effect of Discounting Future Revenues

Many oil corporations have tended to give less weight to discounted revenues on purchases of oil reserves. As oil producers, they face a continual battle to replace the reserves they produce each year. Rising costs of drilling and exploration, plus the increasing difficulty in finding substantial reserves, further complicate the problem. Consequently, with reserves as their asset foundation, future revenues from reserves are important to them, notwithstanding the fact that the discounted value of these revenues is small in the future. Farrier² reports the following. "One economic stimulus to the acquisition of crude oil producing properties has been heavy dependence of the industry upon a depleting natural resource. With the present extractive processes for shale oil and tar sands still uneconomic, crude oil reserves remain essential to the continued existence of oil companies."

Less emphasis must have been placed on discounting future revenues in the recent large purchases where it appears that the purchaser is going to wait for 10 to 13 years before recovering his equity. Most of these were made via the "ABC" route with the seller retaining an oil payment. Unless there are unusual circumstances, the pattern seems to be that it takes from 8 to 10 years for the oil payment to retire, and then an additional two to three years before the purchaser's original equity investment is recovered. Consequently, any value based on present worth of future revenues suffers badly when the profit is delayed until the 10th to 13th year.

Purchases by Groups

Purchases by combinations or groups of companies may result in higher (or lower) prices than purchases made by single companies, due to several factors.

Groups may be able to consider larger purchases because of more available equity and a large credit call on the financial institutions. Maximum credit availability could produce a higher purchase price. On the other hand, even though a larger credit call is present, it is likely that more financial institutions will be involved and it will take a longer time to contact and arrange for a financial commitment.

Multiple purchasers may be able to utilize the properties better from a geographic standpoint, as discussed before, because of their larger aggregate geographic spread. There is a better chance that the producing, gathering, refining and marketing facilities could be utilized to the utmost by the group compared to a single purchaser. In some cases, however, if the purchased properties are to be "spun off" to the individual companies after purchase, there may be disagreement as to who gets what. It may be difficult to determine or agree on the proportionate amount of equity attributable to properties spun off.

A more accurate, thorough, detailed geological and engineering evaluation may be possible because of the larger technical staff available. The group is more apt to have technical personnel who are thoroughly familiar with every geographic area involved. However, there may be

disagreements between the technical staffs of the several companies on the reserves or value of substantial segments of the properties being considered.

There may be a trend towards a more conservative purchase price because of the difficulty in getting several friendly competitors to agree on a price satisfactory to all. Certainly, the single-company approach to property purchase is apt to be more straight-forward and more aggressive than the group approach.

Management Philosophy

Obviously, the managements of the various companies who are potential purchasers of oil properties do not have the same viewpoints. There is always a difference in the degree of their aggressiveness, as well as in the amount of risk they are willing to assume in any given situation. These factors directly affect larger property purchases because the final purchase price is usually determined by the top echelons. Some managements are oriented more towards one phase of the industry, i.e., geological, producing, refining or marketing. Depending on the degree of phases involved in any purchase, management may severely down-grade a property which contains substantial values in a phase less familiar to them.

A different degree of confidence may exist between the technical personnel (preparing the property study) and management in one company compared to another; therefore, identical technical results might produce different market values because of discounting by management. Lack of good communications between the technical people and management may prevent the concept of the real quality of the properties from being realized by the top echelon. The real potential value of "plus" factors, such as new reservoir recovery techniques applicable and the non-producing acreage inventory, may also be lost in this manner.

Type of Acquisition

Purchase for Cash

The different sources of cash used for property purchase may be an influence on the price paid for the property. The money may come from cash on hand, loans, stock sales, issuance of debentures or from co-venture groups. Because of their financial standings, some purchasers may find borrowed money readily available to them and oil payments easy to finance. An existing company may sell additional stock in order to raise the necessary cash for the purchase, or they may issue debentures. The price a purchaser is willing to pay may be influenced on one hand by a source of funds that dilutes his equity, and on the other hand by funds that may result in substantial leverage for the equity. Some sources of funds may be looking for a high degree of safety, while others may want to share in a higher risk and, consequently, a higher ultimate profit.

The most frequent method of cash property purchase is through the use of production payments in the ABC-type³⁻⁷ transaction. In a straight cash purchase (with or without a loan), the purchaser cannot let the property pay for itself without income taxes absorbing a substantial portion of the property's future revenues. Use of the ABC transaction permits the buyer, substantially, to pay for the property from the revenues generated, undiminished by Federal income taxes. The seller receives his total price in cash and is able to effect a capital gain on the sale. The Internal Revenue Service has ruled favorably on the ABC transaction⁸ many times, and the tax consequences to

the several parties involved are understood and accepted. The tax savings available through the use of the ABC method produce higher after-tax profits and, consequently, higher purchase prices.

Mergers and Stock Acquisitions

The trend toward company mergers in recent years has increased the competition for this type of property acquisition. Property acquisitions by stock exchanges and/or mergers offer the advantage of a tax-free exchange for the seller while the buyer puts up relatively little cash. When a seller will not or cannot accept cash, stock trades have been the most frequently-used trade medium. The buyer is subject to further equity dilution, however, due to the issuance of additional stock. Promotional groups have been successful in raising money for acquisition of companies or properties by issuance of stock or debentures in a new venture group. The past successes of some of these groups make their stock readily salable, and many times over-subscribed, so that the founders frequently have a substantial interest at a low cost to themselves. The increasing trend towards oil property acquisition and mergers is illustrated by Farrier's statement² that, in the 69-month period from Jan. 1, 1954 to Oct. 1, 1959, "there were 519 complete or partial company acquisitions made by 238 acquiring companies or individuals. . . . Included in these property transfers were transactions involving common stock mergers, acquisition of part interest in common stock of other companies, and purchases of other companies' properties. . . ."

Incentive to Institutional Investors

The size of a loan that can be obtained on any particular property is a major factor determining what a purchaser is willing to pay for the property. Obviously, the most a purchaser can pay for a property is his cash and/or stock, plus what he can borrow. Traditionally, those lenders in the oil loan field have been dependent on interest rates and a small amount of associated business for their profits. It is evident that no great risk can be incurred for profits from interest rates of 5 to 7 per cent.

In recent years, however, certain institutional investors such as insurance companies, pension plans and endowment funds have entered the oil-payment loan field. With an inducement of additional profits, these institutional lenders, in some cases, have gradually increased the percentage of the fair-market value which they will loan against oil properties. The added inducement may be accrued interest in excess of normal rates (5 to 7 per cent), a portion of the net profits from the properties after loan payout, or actual ownership of some portion after loan payout. These "kickers" are very attractive to these lenders, who normally earn modest returns from conservative investments. Institutions have loaned 90 per cent of the purchase price for a 50 per cent working interest in the properties after loan payout. Some purchases financed in this manner were made at prices far above any that could be supported by normal fair-market-value methods. It is obvious that, in some cases, the larger potential profit has caused lenders to lower their lending standards; this, then, tends to raise sales prices because the smaller the purchaser's own investment, the more attractive the leverage and the less he has at risk.

Competitive Bidding

Oil and gas property sales by competitive bidding have become more frequent, and the indication is that this method will become increasingly popular. This is a logical

development in the existing "seller's market" because it assures the seller of a broad exposure for his properties. In the case of corporations, there is the added advantage of being able to show the stockholders that several bids were received and that the most profitable offer was accepted.

Bid sales have been a strong factor in contributing to the steady increase in the prices being asked for properties. Sales conducted through bidding have put added pressure on prospective purchasers, and the intensified competition has been conducive to higher prices. Understandably, some purchasers have refrained from subjecting themselves to this pressure, preferring to concentrate their time on negotiated sales. The wide variance in the bids received for the same properties is good evidence that factors outside the normal engineering approach have affected fair-market values. In some cases, the high bid approached a figure twice as large as the low bid even though the seller had furnished a consultant's engineering report showing reserves and revenues in addition to the normal data furnished.

The competitive climate generated by successive bid sales has spurred prospective purchasers to explore every possible avenue of potential profit in properties offered for sale. It has also resulted in much higher per-share valuations of companies on offer than can be supported by normal stock-market considerations.

Conclusion

The interplay and overlap of factors outside the engineering evaluation may cause purchasers to arrive at a fair-market value substantially different to that attributable to the straight engineering appraisal. It may appear presumptuous for an outside appraiser-at-large to assume that he can arrive at a competitive fair-market value when he cannot possibly evaluate or give proper weight to these factors.

On the other hand, there is a tendency for engineers to act as if they were wearing blinders and to proceed down a narrow path, ignoring many factors affecting fair-market values outside this path. Although the company engineer or outside appraiser may have little or no control over these influences, he should be aware of how they may affect the profit stream as calculated in the engineering analysis. The engineer should seek to understand the broader concepts and remain vigilant to the fact that these outside influences, in most cases, will tend to produce higher property purchase prices.

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EDITOR'S NOTE: A PICTURE AND BIOGRAPHICAL SKETCH OF GERALD E. SHERROD APPEAR ON PAGE 1365.