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Natural Resource Disposal Policy - Oral Auction versus Sealed Bids

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[SYMPOSIUM]

NATURAL RESOURCE DISPOSAL POLICY— ORAL AUCTION VERSUS SEALED BIDS*

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Federal and state ownership of natural resources in the United States is vast. For example, a 1963 inventory revealed that 56 per cent of the net volume of sawtimber in the United States was in public ownership.[1] Simply in terms of area, 34 per cent of the Nation's surface is in federal government ownership.[2] Federal ownership is concentrated in the states West of the Mississippi River and highly concentrated within this group. Federal ownership in the State of Alaska still accounts for 99.77 per cent, in Nevada, 86 per cent, and in Idaho, 64 per cent of the total surface area.[3] Some federal land contains valuable natural resources. Senator Allott of Colorado is fond of pointing out provocatively that the oil shale resources located in the corners of Colorado, Utah, and Wyoming and in federal ownership are worth "more than seven times the 317 billion dollars national debt of the United States."[4] Resources available in the tidelands, submerged lands, and the Outer Continental Shelf under control of the states and the federal government are now being tapped for their oil and gas resources while other natural resources of the sea are of great potential value for future exploitation. Under the economic system to which this country is committed, natural resources in public ownership, for the most part, must be transferred to private ownership for processing. Therefore, sales policies are required for the orderly disposal of publicly owned natural resources.

One issue among many in sales policy concerns the bidding method. When resources are subject to competitive bidding, should offers be made by oral auction or by sealed bids? Bidding method is but one of several important issues in resource sales policy.

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1. U.S. Dep't of Agriculture, Timber Trends in the United States 156 (Forest Resources Rep. No. 17, 1965).

2. U.S. Dep't of the Interior, Public Land Statistics, 1965, at 11 (1966).

3. *Ibid.*

4. Senate Comm. on Interior and Insular Affairs, *Oil Shale*, 89th Cong., 1st Sess. 8 (1965).

Other public policy issues respecting sale policy include the following: (1) Should minerals be sold by competitive or non-competitive processes? (2) If competitive, should bidding be on a bonus, a royalty, a profit-share, or some combination basis? (3) Should there be charges in addition to the item bid on, such as a royalty and an annual rental? (4) Should a royalty charge be a sliding scale, or a flat rate? (5) Should a market based refusal price be stipulated? (6) Should less than "true cash value" be sought for publicly owned resources on the argument that their exploitation should be subsidized for developmental purposes? (7) Should joint bidding for natural resources be permitted?

Choice of sales policy becomes important partly as a result of the market structure of buyers. Although there are many buyers of timber in the United States, the effective geographical market for timber is very limited. This follows from its very high weight per unit of value. Thus, in the Douglas fir region, 70 per cent of the timber sold from national forests is purchased by buyers located within fifty miles of the sale location and 92 per cent of such volume is limited to a seventy mile radius.[5] Within this relatively narrow geographical market there are typically few buyers, hence the structure of the timber buyer market may be characterized as oligopsonistic. Similarly when the federal or state governments lease submerged land in the tidelands or Outer Continental Shelf, bidders are typically limited to a few large firms, bidding either as individuals or part of a joint venture. This oligopsonistic structure tends to prevail also in Alaska, both continental and offshore, partly because of the hazards of weather and water. When oil shale resources are ultimately made available for lease, one should again expect to find only a few large firms interested and able to effectively enter the bidding market. Effective bidders will be limited by knowledge of the technology of oil shale exploitation and the fact that a relatively small plant to produce shale crude oil is estimated to cost between 80 and 100 million dollars.[6]

Where oligopsony prevails rather than perfect competition in the market for natural resources, careful consideration must be given to the bidding method selected as part of sale policy. In oral auction bidding where the identity of bidders is usually known, such tactics as preclusive bidding and punitive bidding are facilitated. In addi-

5. Mead, Competition and Oligopsony in the Douglas Fir Lumber Industry 93 (1966).

6. Oil Shale Development Corporation, Oil Shale Development on Federal Land, a statement prepared for the Oil Shale Advisory Board, Nov. 30, 1964, p. 2.

tion, collusive practices are more easily policed by the participants. In contrast, sealed bids introduce an element of uncertainty, making each of the above practices either impossible or more difficult. In addition, where competition is weak, a refusal price approximating fair market value may be necessary. Clawson and Held wrote:

> The effective market is so 'thin' for many products from Federal lands that competitive bidding under no restrictions would produce a low price. There is always the danger of collusion among potential bidders. For this reason most Federal agencies for most sales on a supposedly competitive basis insist on some minimum price at which the bids must begin, the minimum price being established by an appraisal process.[7]

When natural resources in public ownership are transferred to private ownership for processing and commercial use, a price approximating the competitive price should be obtained as a matter of equity between buyer and seller (the tax-paying public). In 1964 the Bureau of the Budget restated the general principles of natural resource pricing for federal resources: "Where Federally owned resources or property are leased or sold, a fair market value should be obtained. Charges are to be determined by the application of sound business management principles, and so far as practicable and feasible in accordance with comparable commercial practices."[8] Clawson and Held remind us further that:

> In the nature of things, the use of the federal land is available to some citizens and not to others; this is essentially true for those uses which produce salable products. Those who enjoy the gains from federal land use should pay a reasonable price for that use. Such payment on their part is equitable inasmuch as their competitors must bear the cost of similar resources from private land . . . .[9]

The objectives of this Article are to analyze and appraise the oral auction and sealed bid alternative methods of bidding for natural resources in public ownership. Appraisal of these alternatives will be in terms of the objectives as stated above. The Article is in four parts. Part I will show the prevailing bidding practices for the

7. Clawson & Held, The Federal Lands: Their Use and Management 203 (1957).
8. U.S. Bureau of the Budget, Natural Resource User Charges: A Study 2 (1964).
9. Clawson & Held, *op. cit. supra* note 7, at 10.

federal and state governments. Part II will be concerned with the theory of auction markets. Part III will set forth and test select hypotheses. Part IV will be concerned with public policy implications.

I

PREVAILING BIDDING PRACTICES

Both oral and sealed bid practices are in wide use for public timber and oil and gas sales. In order to get a reasonably comprehensive view of prevailing practices among the various federal agencies and the several states, a survey was made. The findings, shown in table 1, indicate a prevalence of oral bidding for timber sales by the two major federal agencies, the United States Forest Service and the United States Bureau of Land Management, and a prevalence of sealed bids in oil and gas leasing. The federal government makes exclusive use of sealed bids, both in its continental oil and gas leases, and on the Outer Continental Shelf. Among the states having an active competitive oil and gas leasing program, eleven use sealed-bidding, five use oral bidding, and one (Colorado) uses a combination.

It should be made clear that whether bidding is by the oral or the sealed-bidding method, the object of bidding may differ. As shown in table 1, the object of bidding for oil and gas is normally the amount of the cash bonus, the highest bidder being the winner. But the State of Pennsylvania specifies royalty bidding for its developmental leases while using bonus bidding for its exploratory lands.[10] The California Public Resources Code permits the State Lands Commission to designate any one of three bidding objects: (1) a cash bonus with a specified sliding scale royalty on oil and gas at not less than 16 2/3 per cent of well head value, plus one dollar per acre annual rent, or (2) a multiple of a specified sliding scale royalty commencing at 16 2/3 per cent, plus annual rent, or (3) a flat rate of royalty not less than 16 2/3 per cent, plus annual rent.[11] Largely because state lands offered for lease have, thus far, been limited to "wildcat" rather than proven lands, the first alternative has been selected almost exclusively. Finally, two states (Alabama and Kansas) permit bidding on any one or a combination of bonus, royalty, and/or rent, while two states (Illinois and Louisi-

10. Data for this section have been developed from published regulations, letters from agency directors, and personal interviews.

11. Cal. Pub. Res. Code § 6827 (West 1956).

TABLE 1

COMPETITIVE LEASE BIDDING METHOD AND OBJECT OF BIDDING FOR PUBLIC TIMBER AND OIL AND GAS RESOURCES, FEDERAL AND ACTIVE STATE GOVERNMENTS

	Bidding Method		*Object of Bidding*		
	Oral Auction	*Sealed Bid*	*Bonus*	*Royalty*	*Rent*
FEDERAL GOVERNMENT OWNERSHIP					
TIMBER					
Bureau of Land Management (U.S. Dep't of Interior)	X		X[12]		
Forest Service (U.S. Dep't of Agriculture)	X[14]	X[14]		X[13]	
OIL AND GAS					
Bureau of Land Management		X	X		
STATE GOVERNMENT OWNERSHIP					
OIL AND GAS					
Alabama		X	X	X	X
Arkansas	X		X		
California		X	X	X	
Colorado	X[15]	X[15]	X		
Florida			X	X	
Illinois			X	X	X
Kansas		X	X	X	X
Louisiana		X	X	X	
Montana	X		X		
Nebraska	X		X		
North Dakota	X		X		
Oklahoma		X	X		
Pennsylvania					
Exploratory leases		X	X		
Developmental leases		X		X	
Texas					
University of Texas Lands	X		X		
General Land Office		X	X		
Utah		X	X		

12. "Lump-sum" bidding for BLM timber is equivalent to bonus bidding.

13. "Scale" bidding for United States Forest Service timber is equivalent to royalty bidding.

14. The United States Forest Service uses both bidding methods but oral auction bidding strongly dominates in the West while sealed bidding dominates in the East.

15. Colorado accepts sealed bid offers of ten dollars per acre bonus or more. If

ana) permit bidding on either or both the bonus and/or royalty.[16] Where combined bidding objects are permitted, the state administrative agency must decide which combination of unlike objects constitutes the winning bid. In combination bids it is normally impossible to select the high bidder mathematically or objectively.

II

THEORY OF AUCTION MARKETS

"The heart of the bidding problem is that auctions tempt buyers to impose almost perfect discrimination on themselves."[17] In order for the conditions described in the foregoing quotation to hold true, there must be no sense of a going market price and instead, all buyers must act as if they had one and only one chance to obtain the desired quantity of the needed resource. Further, they must pay that price which reflects the highest amount they would be willing to pay rather than go without.

The real world of natural resource markets is not of this character. If there is no sense of a going market price, it is because natural resources *in situ* are heterogeneous. No two timber sales and no two oil leases are exactly alike. In addition, while in some instances the market extracts the last dollar from the bidder, in other instances, only one bid is cast in a one-bidder situation and the sale or lease is transacted at a minimum acceptable price.

Whether bidding is by the oral auction or sealed bid method, a responsible bidder normally will independently estimate the value of the resource offered, including a normal profit. The approach commonly used is a residual value approach. An estimate is made of the value of products into which the resource may be converted. From this value, all necessary costs of production are subtracted. The remainder is further reduced by the required normal profit. Where there is a significant degree of uncertainty present, probability density functions may be estimated for relevant variables such that the final residual value estimate reflects the uncommon risks. Such an estimate would ordinarily become the maximum bid expected in the long-run to yield a normal profit to the buyer.

A. An Oral Auction Model

An oral auction bidding model for timber is shown graphically

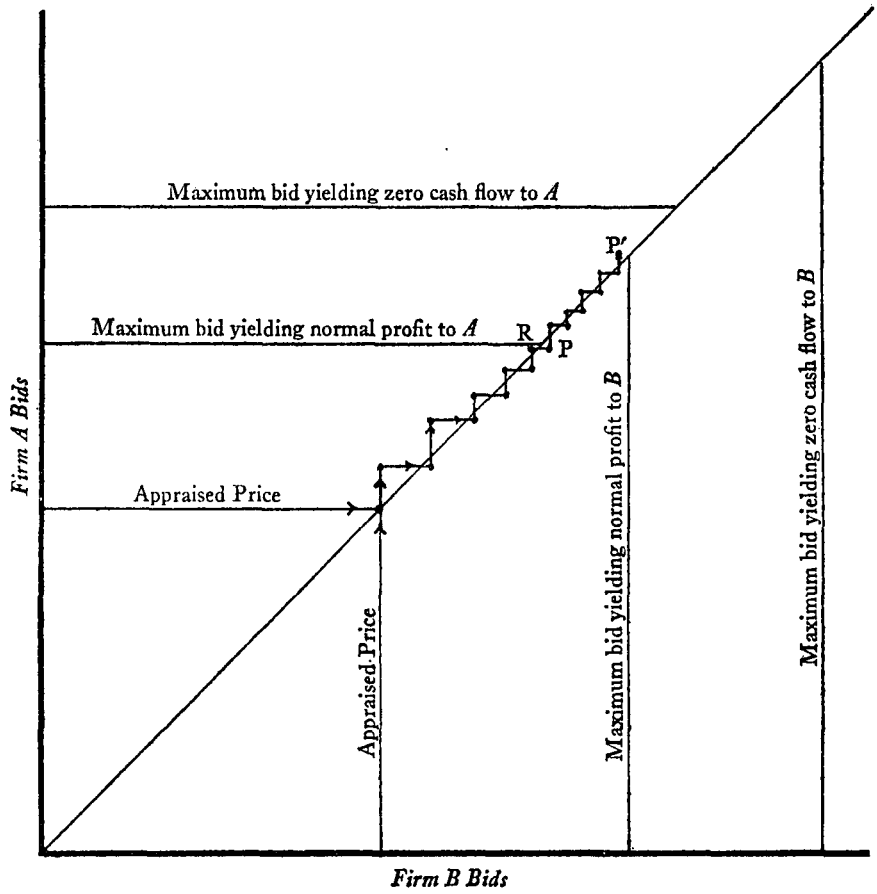
less than this amount is received by sealed bid, or none at all, the tract is offered in oral bidding.

16. See note 10 *supra*.

17. Sosnick, *Bidding Strategy at Ordinary Auctions*, 45 J. Farm Economics 165 (1963).

in figure 1. Where there is a previously announced minimum acceptable bid, any oral bids must begin at this point or higher. In the case of timber sold by either the Forest Service or the Bureau of

FIGURE 1
ORAL AUCTION BIDDING MODEL—TIMBER



Land Management an appraised price is calculated and announced prior to the sale. The determination of the appraised price is based upon "costs and returns applicable to representative forest-product operations of average efficiency. Prices received for National Forest stumpage must also be considered."[18] Further, "market value

18. U.S. Forest Service, Handbook § 2423.12 (undated).

as used by the Forest Service in stumpage appraisals is the price acceptable to a willing buyer and seller, both with knowledge of the relevant facts and not under pressure or compulsion to deal. This price is sometimes called 'fair market value.' "[19] Finally, "National Forest timber may be sold at not less than the appraised price."[20]

In lieu of the announced minimum acceptable price, Sidney Weintraub has suggested that the Forest Service consider use of concealed appraisals. In order to avoid arbitrariness, Weintraub suggests that such appraisals should then be sealed and stored to protect their secrecy prior to completion of the sale. Under this plan the *principles* of appraisal would be promulgated rather than the *amount* of the appraisal. Secret refusal prices would avoid the observed fact that the appraised price places a floor under bidding.[21] A similar suggestion was made by the United States House of Representatives Committee on Government Operations.[22]

The Bureau of Land Management appraisals are governed by similar regulations. Thus, in timber sales an effort is made to establish a refusal price, the appraised price, which accurately reflects market values.[23]

Under Forest Service bidding procedures in oral auction sales, all interested bidders must first qualify for oral bidding by means of a sealed bid at equal to, or greater than, the appraised (minimum) price, plus a cash deposit. In this situation the sealed bid is merely a prelude to oral bidding and such sales are classified as oral auction sales. If only one bidder is present and qualified at the time of sale, then bidding is closed and the sale is awarded to such single qualified bidder, normally at the appraised price.[24]

19. *Ibid.*

20. *Ibid.*

21. Weintraub, Stumpage Prices and Appraisal Policies 122 (U.S. Forest Service 1958).

22. House Comm. on Gov't Operations, *Federal Timber Sales Policies*, H.R. Rep. No. 2960, 84th Cong., 2d Sess. 25 (1956).

23. In fact, appraisals by the Forest Service have fallen significantly short of market values established under competitive conditions. An analysis of 2,340 oral auction timber sales in the Douglas fir region in the four year period 1959-1962 revealed that 67.9% of all national forest timber was actually sold under competitive conditions and the average price bid exceeded the appraised price by 63%. Mead, *op. cit. supra* note 5, at 190. The small number of no-bid sales further supports the point that Forest Service appraisals are below market values. For the Douglas fir region no-bid sales have been tabulated and published since January 1964 only. For the ten quarters ending June 30, 1966, 1% of the volume and 2.3% of the sales offered received no bids. U.S. Forest Service, National Forest Advertised Timber Sales, Region 6 (1966).

24. In the Douglas fir region from 1959 to 1962, 17.6% of all national forest timber sales were one-bidder sales and were awarded at the appraised price. Mead, *op. cit. supra* note 5, at 190.

Sales may be non-competitive even though two or more bidders become qualified to bid by means of their sealed bid at the appraised price. Where identical sealed bids have been submitted at the appraised price, one of the several qualified bidders will make an oral auction bid at a token amount above the appraised price. If other qualified bidders (representing potential buyers who have taken the trouble and incurred the expense of becoming qualified to bid) remain silent, then the timber sale is awarded to the token bidder.[25] Thus, 32.1 per cent of national forest timber sales in the Douglas fir region are transacted under essentially noncompetitive conditions at approximately the appraised price. The token bid sales described here strongly suggest collusive bidding practices. Oral auction bidding, by its nature, facilitates collusion which results in buyers obtaining timber at the appraised price. The qualifying mechanism described above absolutely limits oral bidding to those who have previously qualified. The identity of the qualified bidder is defined and the amounts bid are known. There is no further possibility of an unqualified bidder who might be outside a collusive agreement (a "sleeper") submitting a higher bid not subject to challenge. The presence of implicit or explicit collusion in timber bidding is freely acknowledged. A General Accounting Office study reported: "Representatives of the Forest Service and the BLM stated that they are generally aware that agreements exist between certain operators, often referred to as a 'Gentlemen's Agreement,' whereby the operators will refrain from purchasing government timber outside their respective areas."[26]

Where competition is effective, that is, where two or more bidders are qualified to bid and engage in serious bidding, the pattern of bidding may follow the stair-step development shown in figure 1. The diagonal forty-five degree line indicates equal bids from bidders *A* and *B*. Successive bids must cross this diagonal line. Bids (dots) to the right of the diagonal line may be interpreted as *B*'s reaction function in a Cournot-Bertrand type duopsony model. The location of dots on either side of the diagonal depends upon each bidder's preferences.

Figure 1 indicates that each bidder will have some estimate, ob-

25. In the Douglas fir region 14.5% of all national forest timber sales from 1959 to 1962 were classed as token bid sales and were awarded at token increases over the appraised price. *Ibid.*

26. U.S. Comptroller General, Report of Investigation of the Sale of Government-Owned Timber by the Forest Service, Department of Agriculture and the Bureau of Land Management, Department of the Interior 9 (undated mimeo.).

tained with various degrees of precision, of his maximum bid which will still yield him a normal profit. The model suggests that *B* is more efficient than *A*, because *B*'s maximum bid to yield a normal profit is higher than that of *A*. The graphic model indicates that *A* has bid to his limit given by his normal profit calculations at point R. A subsequent raise to point P by *B* obtains the sale short of his own maximum bid on a normal profit basis.

Figure 1 also shows that bidders may have a second concept of a maximum bid based upon a sacrifice of normal profits as well as such fixed charges as depreciation. A maximum bid in this sense would yield zero cash flow and may be called "desperation" bidding. If *A* is short on timber reserves and faces a possible close-down of his operation, he may elect to bid above his maximum bid yielding a normal profit, up to the maximum bid based upon zero cash flow. Point P′ in figure 1 indicates such a bid by *A*. If *B*, on the other hand, is not hard pressed for additional timber supplies, he may elect to not bid above his maximum bid based upon normal profits and allow *A* to obtain the sale at P′.

In addition to the close-down alternative as a justification for desperation bidding above a maximum bid to yield normal profit, firms occasionally will wish to cast a series of preclusive bids, bids designed to prevent "outsiders" from establishing a position in what is frequently called "my area." Preclusive bidding may take the form of making entry expensive or of denying entry at any cost. Under less rational conditions, punitive bidding may take place where one bidder attempts to punish another for some past transgression. The method of punishment involves "bidding up" another bidder to prevent him from obtaining a desired sale. Also, an oral auction bidding situation is subject to emotional bidding which may carry a bidder above his previously determined maximum. Concerning emotional bidding, the Chief of the Division of Timber Management, United States Forest Service, testified:

> in an area of intense competition, when you get an auction where two bidders who want this timber real badly start bidding against each other, they often go higher than they really should . . . . I think this is one of the negative factors of auction bidding, occasionally people get carried away emotionally in an auction sale and bid more than they should.[27]

Oral auction bidding also facilitates "implicit bargaining." Fellner

27. O and C Advisory Board, Committee on Bidding Procedures for Federal Timber, Minutes 123, Portland, Ore., Nov. 23, 1965.

differentiated "implicit bargaining" from "explicit bargaining" where the latter requires direct contact and negotiations between the parties concerned. Implicit bargaining, on the other hand, is a situation in which "each party tries to find out from the responses of the other parties what the ultimate consequences of his own patterns of behavior are. . . . Implicit bargaining normally results in quasi-agreements."[28] In oral auction bidding all participants know their opposition as soon as bids are cast and have an opportunity to react back and forth in the process of successive bidding. This is not the case in sealed bidding procedures. Oral auction bidding permits a series of signals (implicit bargaining, to use Fellner's term) quite similar to bidding in the card game of bridge. For example, in national forest oral bidding which requires qualification by an initial sealed bid, one bidder may elect to submit a sealed bid at a price in excess of the appraised price. This is an unnecessary effort and in the event of only one qualified bidder would, of course, result in a higher than necessary cost of timber to the single bidder. Where this is done it may be intended to convey the message that such bidder is desperate for timber and is determined to be the successful bidder; it is an implicit plea to others to avoid unnecessarily "running up the cost" of timber to such determined bidder. On the other hand, a sealed bid in excess of the appraised price may also be explained as an item of bidding strategy wherein such a bidder places himself immediately in the high bidder position. This requires that others who wish to bid must specifically and knowingly challenge his position, whereas his own initial sealed bid above appraised price was an impersonal challenge in the sense that he was not bidding against a known high bid position of another firm.

Large raises by one firm may also carry a message of determination. Figure 1 illustrates two such initial large bids by *A*. *B* is then given an opportunity to accept the message and abstain from bidding, or to ignore it as is shown in figure 1 by his own continued response up to P′.

Oral auction bidding of the type used by the Forest Service, which requires a qualifying sealed bid, also permits a bidder to consciously yield to another firm thereby establishing his own claim to a subsequent sale. Thus, a firm that qualifies by virtue of a sealed bid but allows another firm to obtain the sale with a token increase, may then appeal to the successful bidder to reciprocate by abstaining in a subsequent sale. This type of implicit bargaining of course requires

28. Fellner, Competition Among the Few 15-16 (1949).

that the community of bidders be rather well defined. In many areas within the Douglas fir region this tends to be true. In contrast, bidding for oil and gas leases does not involve a similarly well defined community. When oil shale resources are offered for sale, a reasonably well defined community of bidders may exist by virtue of (1) the very high capital cost of entry into oil shale processing, and (2) the relatively new technology.

Oral auction bidding also facilitates explicit bargaining and agreement as well as implicit bargaining. For example, *A* may agree to abstain from oral bidding in favor of *B*. In an oral bidding situation, *B* is able to police such an agreement since all bids are in the open and *B* retains an opportunity to react. In contrast, under sealed-bidding procedures *A* may decide to break such an agreement and *B* is denied an opportunity to react with a higher bid.

The maximum bid amounts shown for *A* and *B*, indicate a rather wide difference in timber valuation. This is in accordance with an observation that firms in the lumber industry differ widely in efficiency. Some very large firms having timber in fee ownership acquired at historically very low cost are not able to produce lumber at a profit. Others without owned timber reserves are forced into the expensive public timber markets. But some of the latter are still able to earn an attractive profit. This observation of widely varying efficiency is consistent with the Leibenstein "X-Efficiency" thesis, that people often do not expend their best effort in production and that output is capable of substantial increases as a result of more effective utilization of given resources.[29]

In oil and gas oral auction bidding the previously announced minimum acceptable bids tend to be purely statutory or regulatory prescribed minimums and have very little to do with actual value. Consequently, where competition is effective, bids may exceed the minimum by ten-fold or a hundred-fold as suggested in figure 2. Oil and gas leases administered by the University of Texas where oral auction procedures are employed commonly have a minumum acceptable bid of twelve dollars and fifty cents per acre.[30] Oral auction sales conducted by the State of New Mexico have a uniform ten dollar per acre minimum bonus for all leases offered in Lea County, while other areas are subject to a minimum bonus plus first year rental of one

29. Leibenstein, *Allocative Efficiency vs. "X-Efficiency,"* 56 Am. Econ. Rev. 56 (1966).

30. Interview With James B. Zimmerman, Geologist in Charge, University of Texas, Austin.

hundred dollars in total.[31] Therefore, the minimum acceptable price in New Mexico outside of Lea County varies with the size of the lease, as well as with the minimum per acre rental provision. There is little or no relationship between the quality of the land and the minimum acceptable price in oil and gas leasing. In view of the great geophysical uncertainty in estimating the presence and quantity of oil or gas underground, one would also not expect to find a reliable relationship between price bid and subsequent productivity. In the case of timber, the asset desired is above the ground, though beneath the bark. The uncertainty is consequently of a much lower order of magnitude and more realistic appraisals may be set.

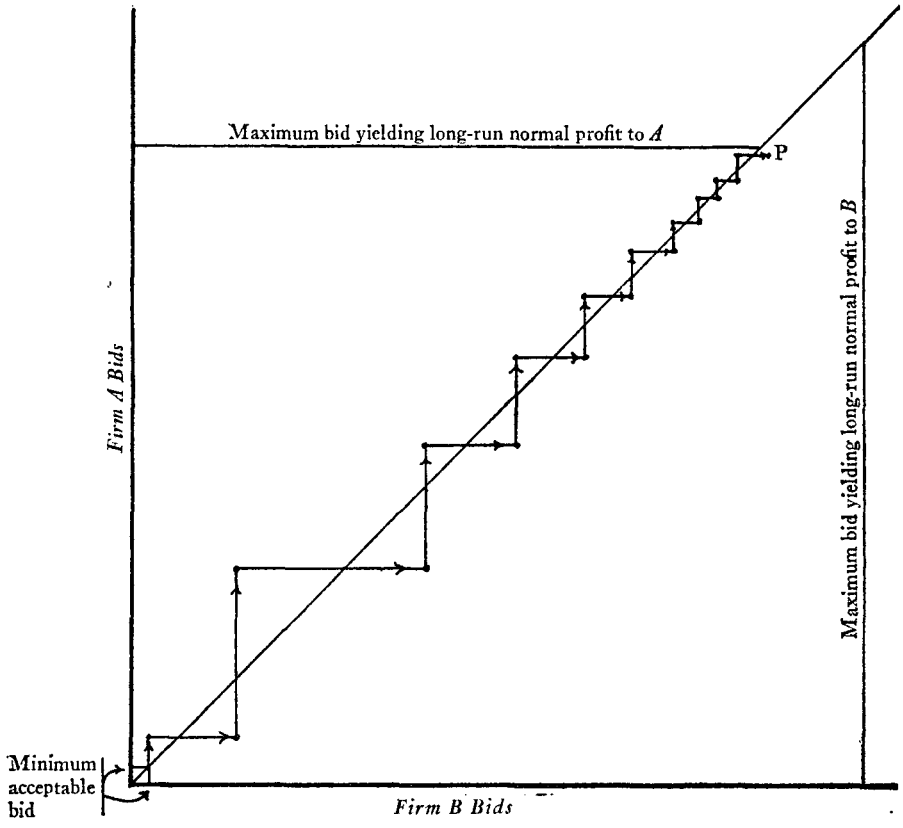
Figure 2 differs from figure 1, not only by the realism of the minimum acceptable price with respect to possible subsequent bidding, but also in the character of the bidding and the probable absence of a double maximum in oil and gas oral bidding. Price leadership in timber bidding is in the hands of individual bidders who make whatever raises they wish. The "auctioneer" is simply a passive recorder of offers and interpreter of auction regulations. He does nothing to stimulate bidding at the auction. As a result bidding may pass through a variety of raises and a single timber sale may last for an hour as bidders cast a series of "nickel" and "quarter" bids. On the other hand, oral bidding for oil and gas resources, where premium bids over the minimum acceptable price tend to be much greater, is more carefully structured. The University of Texas employs an auctioneer who elicits bids. Consequently, the pattern of bidding tends to begin with larger raises and to taper off near the final bids. Finally, oil and gas bidders are less likely to have two maximum bids. Value estimates are, by the nature of geophysical uncertainty, subject to very wide estimating errors. A firm may, however, bid above its normal maximum where it has control over adjoining leases and wishes to block-up its lease holdings.

The principal argument in support of the oral auction method, from the timber buyer point of view, appears to be the single point that this procedure offers bidders an opportunity to react to the known bids of known competitors. This point is, of course, extremely important to any bidder whose plant investment is fixed geographically and who is dependent on publicly owned natural resources sold at auction. From a broader point of view, *where competition is effective*, it offers an efficient means of price determination and

31. Interview With T. Billberry, Administrator, New Mexico State Land Office, Santa Fe.

FIGURE 2

ORAL AUCTION BIDDING MODEL—OIL AND GAS



consequently of resource allocation. Where competition is inadequate, our oral bidding models suggest that prices will range over a wide spectrum, from bargains obtained at the minimum acceptable price, to extremely high prices resulting from preclusive, punitive, desperation, or emotional bidding conditions.

B. A Sealed Bidding Model

Sealed bidding procedures are commonly used in competitive leasing of minerals including oil and gas. The Bureau of Land Management uses sealed bidding exclusively on both continental and Outer Continental Shelf oil and gas sales. Similarly, most

states use sealed bidding for oil and gas sales. Sealed bidding is not commonly used in timber sales. In Oregon where most of the BLM timber sales occur, sealed bidding procedures have been limited since 1955 to the few small business set-aside sales. The Forest Service relies primarily on oral auction procedures for timber sales in the West, while in the East, sealed bidding procedures are widely used.

One needs to understand some of the details of the sealed bidding procedure in order to appraise its effectiveness. Sealed bids must be submitted in advance of a given sale, one hour in advance in some instances, while in others, only immediately prior to opening the first envelope. A given scheduled sale normally consists of many separate tracts. For example, over the period 1954 through 1965 there have been ten oil and gas sales conducted by the Bureau of Land Management in the Outer Continental Shelf region of the Gulf of Mexico. A total of 2,813 tracts were offered for lease and 1,335 leases were issued. The remainder received no bids or were withdrawn. Under sealed bidding procedures, a bidder must file separate bids for each lease desired prior to the opening of bids submitted on any one of the several tracts offered. A bidder may not raise or lower his bid or submit an additional bid for any one tract being considered or on subsequent tracts that are part of the same sale. Bids are considered to be simultaneously opened for all tracts offered in a given sale. The only exception to this simultaneous opening principle is found in California where sealed bid sales have been conducted as a series. In these instances, a feedback was possible wherein information gained from the experience on one lease could be utilized in another single offering on the following day.

Sealed bid sales normally include an announced minimum acceptable bid. In the case of oil and gas sales the announced minimums bear very little relationship to any estimate of true cash value. Bureau of Land Management sales of Outer Continental Shelf leases off the coast of California, Oregon, and Washington have used a five dollars per acre minimum bonus, plus one-sixth royalty and three dollars per acre annual rent. Bureau sales on the Outer Continental Shelf in the Gulf of Mexico have required a fifteen dollars per acre minimum bonus bid for wildcat land and twenty-five dollars per acre minimum bonus for drainage sales. State land in Texas administered by the General Land Office requires a twenty dollars per acre minimum bonus bid, one-sixth royalty, and five dollars per acre annual rent. Another class of land administered by

the same agency requires twenty-five dollars per acre minimum bonus.

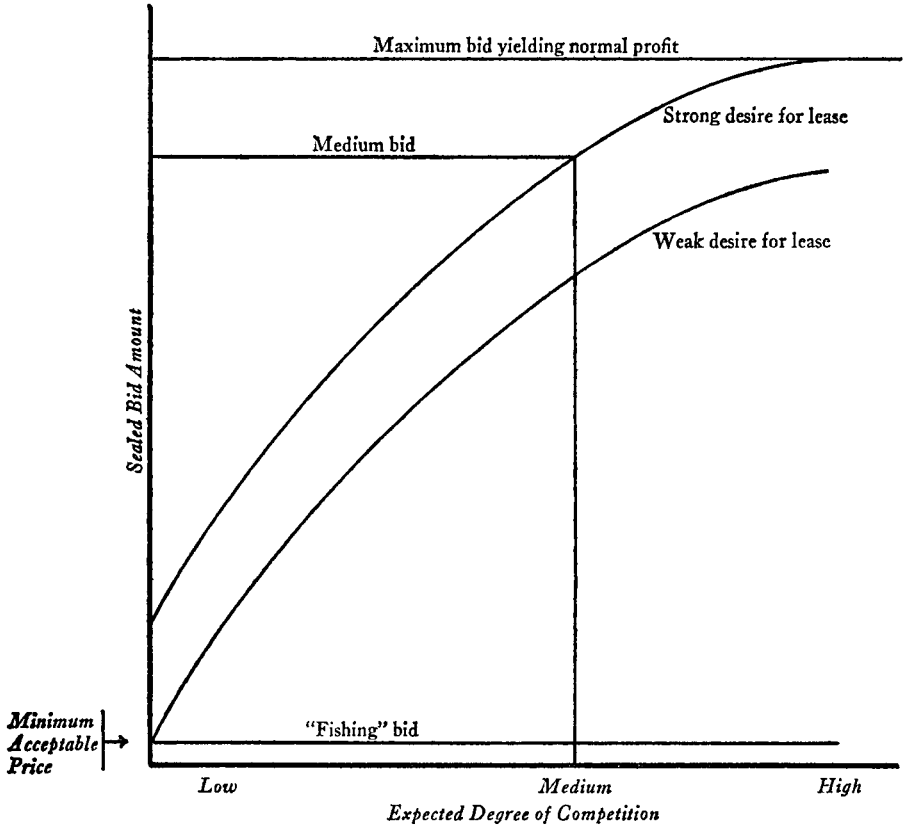
Occasionally the minimum acceptable price is kept secret until all bids have been received and opened. This procedure is followed by California in its oil and gas leasing program. Further, the State Lands Commission makes no estimate of its minimum acceptable bid until sometime after all bids have become available. The Public Resources Code of California requires that "all factual and physical exploration results, logs, and records resulting from the operations under the permit" be made available to the State Lands Commission upon request.[32] A refusal price that bears some relationship to the potential productivity of the lease would require the state to make its own geophysical survey. This is not only expensive, but raises a security problem as well. Where competition is strong for any given lease resulting in relatively high prices, careful examination of a refusal price becomes unnecessary. In other cases, the availability of geophysical data supplied by bidders minimizes the cost of analysis to the state. The obvious problem arising out of this post-bid appraisal is that questions of favoritism may arise.

Figure 3 presents a graphic model indicating that one's sealed bid is a function of three variables. Given a geophysical and economic estimate of the maximum bid which will yield a long-term normal profit, and the desire that a bidder has for a given resource, the bid becomes a function of the degree of expected competition. The extent of one's interest in the resource is a subjective judgement. The expected degree of competition is purely speculative. This latter is in contrast with oral auction bidding where the strength of competition is demonstrated and one has an opportunity to react in subsequent bids.

Some bids may be offered at the minimum acceptable price by relatively disinterested buyers. These appear in both oral auction and sealed bidding and are termed "fishing" bids. In oil and gas bidding they are frequently speculative bids submitted by persons who are willing to acquire a lease at the minimum price on a rather low probability of later sale to an operator at a substantial increase in price. All other potential bidders may be classified into two groups having either a weak desire for a lease or a strong desire. Those in the former group who expect no competition may cast a bid at the minimum acceptable price. A slight increase in the degree

32. Cal. Pub. Res. Code § 6826 (West 1956).

FIGURE 3
SEALED BIDDING MODEL—OIL AND GAS



of competition expected is likely to be accompanied by a relatively large increase in the amount of the sealed bid. Subsequent increases in expected competition are likely to be paired with further increases in the amount bid but at a decreasing rate. A medium degree of expected competition is likely to bring forth an approximately competitive response. A high degree of expected competition may not change this competitive response significantly.

Bidders who have a strong desire to obtain a given lease may bid well above the minimum acceptable price, even when they expect no competition. The element of uncertainty may thus produce a premium over the minimum acceptable price under sealed-bidding

conditions. In contrast, under oral auction bidding where competition does not materialize, whether the result of an oligopsonistic structure and collusive behavior, or a lack of interest among buyers, a single bidder will almost universally obtain the resource at the minimum acceptable price. If a bidder with a strong desire to obtain a lease expects a high degree of competition, then he may bid the maximum amount which will still yield him a long-run normal profit. Between the two extremes of expected competition, a bidder strongly desiring to obtain a given lease and expecting to encounter a medium degree of competition may cast a medium bid which is well below his maximum.

Unlike the oral auction bidding model for timber shown in figure 1 which permitted bidding in excess of the maximum bid yielding normal profits, the sealed bidding model in figure 3 shows more restrained bidding with respect to calculated maximum bids. Bids in excess of the normal profit maximum are not likely to be necessary in sealed bidding since competition is speculative whereas in oral auction bidding it is real and demonstrated.

In addition, other reasons for bidding above the normal profit maximum are not present in sealed bidding. Neither preclusive nor punitive bidding is likely since one does not have definite knowledge of other bids and emotional bidding is not likely to be present.

Interviews with land men experienced in appraisals and bidding for oil and gas leases indicate that value estimates are commonly adjusted for the expected degree of competition. A kind of oligopolistic (conjectural) interdependence emerges. A bidder will ask not only how much competition is expected, in the sense of *how many* bidders will submit bids, but will also ask about which specific firms are likely to be among the bidders. In Outer Continental Shelf bidding in particular, bidders are quite well informed about the potential community of interest in a given lease. This follows from the need to engage in extensive geophysical exploration prior to submitting a bid. When A knows that B is likely to cast a sealed bid, the past bidding record of B will normally be examined. But sophisticated leadership in B will know that A will likely be bidding for the same sale and know that A will be examining B's bidding record and may in turn react to thwart A's conjectures about B's pricing. Thus, we encounter conjectural interdependence among bidders.

Some land men representing large oil companies contend that one should bid an amount which will yield a normal long-run profit adjusted for competitive realities and then not be too concerned about

either losing to a higher bid, or winning and leaving a substantial sum of money on the table. These are the two hazards which must be accepted as part of the sealed bidding procedure.

The concept of "leaving money on the table" refers to a substantial gap between the high bid and the second high bid. One encounters this phrase repeatedly in discussions with persons involved in the sealed bidding process. A gap between the high bid and the second high bid reflects different estimates by the bidders of either or both (1) the maximum value of the resource or (2) the expected degree of competition, given an equal desire for the lease. Two pointed examples may be given to illustrate the problem and its accompanying embarrassment for land men. In the August 11, 1959, oil and gas sale by the Bureau of Land Management (BLM) for tracts in the Outer Continental Shelf of the Gulf of Mexico, Shell Oil Company bid 26,105,000 dollars for a 2,500 acre tract. The second high bidder was a combine: Texaco, Pan American Petroleum Company, and Gulf Oil Company bidding 12,367,367 dollars. Thus, on this single tract, Shell left 13,737,633 dollars "on the table."[33] In another case involving substantially less in absolute amount, but a much higher ratio of high to second high bid, the Tenneco Oil Company bid 826,446 dollars for a single tract in Alaska. The second high bidder was Pan American Petroleum Company bidding only 8,744.88 dollars, the ratio of high bid to second high is ninety-five to one.[34]

The two illustrations given above are rather spectacular examples of money left on the table in sealed bidding. The normal relationships between the high and the second high bids may be judged from the record of sealed bidding for BLM oil and gas leases. Analysis of the available record of BLM leases by states and Outer Continental Shelf office revealed that money left on the table in sealed-bidding amounted to forty-eight per cent of the total high bids. The ratio of high bid to second high bid was 1.91 to 1.[35]

The real attitude of land men toward "leaving money on the table" is one of considerable embarrassment leading one to remark, "I'd rather lose a lease than leave money on the table." It might

33. This was Tract No. 694. Bureau of Land Management, U.S. Dep't of the Interior, List of All OCS Sales Held to date—10/9/62 (mimeo.).

34. The bidding involved Tract No. C16-191. State of Alaska, Department of Natural Resources, Results on the 16th Competitive Oil and Gas Lease Sale (1966) (mimeo.).

35. This ratio was developed from records supplied by the Bureau of Land Management. Available data were analyzed through 1963.

be noted that in oil and gas leasing, Canada avoids embarrassing its land men by publishing only the high bid and keeping secret second high and other bids.

From the above discussion one can see that there are apparent advantages to the sealed bidding procedure. First, because the sealed bid is final and must be submitted prior to the sale opening, an important element of uncertainty is introduced which makes collusion more difficult. One cannot define the community of bidders precisely, before the bids are opened. Nor can one know the amounts to be bid. Where unknown bidders (outsiders) *may* appear as serious bidders, a collusive agreement may be ineffective. Second, following from the line of reason given above, even where there is a lack of bidder interest, rather than collusion, results in one-bidder sales under sealed bid procedures, such sales may yield a price close to a competitive price, rather than the often meaningless minimum acceptable price. Third, the uncertainty element also restrains what are frequently called "unfair practices" such as preclusive and punitive bidding.[36] Fourth, there is less opportunity for implicit bargaining of the type outlined in the discussion of oral auction bidding. Under sealed bidding procedures, bargaining between bidders is restricted to pre-sale activities, that is to surveys, explorations, and inquiries. Fifth, since sealed bids are largely determined in the quiet of one's office or in committees, rather than in the excitement of the auction room, there is less likelihood of emotional excesses in bidding.

III

TESTS OF SELECT HYPOTHESES

The preceding analyses suggest several hypotheses which might be tested against the record of resource sales. Limitations of data permit verification of only two hypotheses.

A. Relationship Between Bidding Method and Price Bid

We have reasoned that where competition is unreliable, the use of sealed bidding should produce a price more nearly approximating a competitive price because sealed bidding injects a new degree of uncertainty into bidding. Accordingly, the following hypothesis is advanced: In situations where competition is weak, sealed bidding yields significantly higher prices than oral bidding.

Situations where this hypothesis may be tested are not plentiful.

36. House Comm. on Gov't Operations, *supra* note 22, at 25.

In oil and gas sales there is only one agency that uses both methods, the State of New Mexico.[37] However, the best land is usually selected for oral bidding. There are no means by which quality may be quantified in this instance, hence the data may not be used.

The United States Forest Service uses both methods in several of its regions. For the Douglas fir region there are also estimates of the degree of competition prevailing in forty-three separate geographical markets for timber. In most areas, however, the sealed bidding method is reserved for very small sales.[38] In only 3 of the 43 markets (working circles) do we find both a reasonable number of both classes of sales and reasonably large size sales in both classes. The relevant data are shown in table 2.

TABLE 2[39]

SELECTED TIMBER MARKETS IN THE DOUGLAS FIR REGION

Working Circle	*Average Sale Size (MBF)*		*Number of Sales*		*Percent of Oral*
	Oral Auction	*Sealed Bid*	*Oral Auction*	*Sealed Bid*	*Auction Sales noncompetitive*
1. Skycomish	6,533	3,117	20	25	50
2. South Santiam	3,665	3,542	57	6	55
3. Waldport	4,823	4,371	41	9	28

The first two of these working circles are among the least competitive and the third is in an intermediate group where additional competition would be desirable.

The first hypothesis may be tested by means of a multiple regression analysis yielding the following regression equations:

Skycomish:

$$Y' = -.099 + \underset{(.0196)}{.0303\ X'_1} + \underset{(.0250)}{.0466\ X_2} \qquad (1)$$

South Santiam:

$$Y' = -.096 + \underset{(.0135)}{.0137\ X'_1} + \underset{(.0224)}{.0910\ X_2} \qquad (2)$$

37. Interview With T. Billberry, Administrator, New Mexico State Land Office, Santa Fe.

38. All forty-three working circles were used elsewhere to test the hypothesis that "the bid-appraisal ratio or premium over appraised price shows high values for sealed bid sales and low values for oral auction sales." Mead, *op. cit. supra* note 5, at 188-89. In this broad framework, the hypothesis failed.

39. The source of this table is Mead, *op. cit. supra* note 5, at 211.

Waldport:

$$Y' = -.102 + .0379\,X'_1 + .0798\,X_2 \qquad (3)$$
$$\qquad\qquad (.0235) \qquad (.0389)$$

The variable Y' is a logarithmic transformation of the ratio of the bid price to the appraised price, X'_1 is a logarithmic transformation of sale size in thousands of board feet, and X_2 is sale type ($OA = 1$, $SB = 2$). The figures in parentheses give the standard error of each regression coefficient. In all three tests sealed bid sales yield a higher ratio of bid price to appraised price. In all three the sale type variable is significant at the ninety per cent confidence interval. While additional research is needed on this important relationship, there is a tentative confirmation of the first hypothesis.

B. Relationship Between Bidding Method and the Spread of Bidding

We have reasoned that, relative to sealed bidding, oral bidding should result in a higher frequency of bids at the minimum acceptable price, on one extreme, and at an estimated maximum bid, on the other. The oral bidding spread should be particularly great where competitive and even unfair competitive pressures appear sporadically. The following hypothesis is advanced: The standard deviation in oral auction sales is significantly greater than in sealed bid sales.

The oil and gas sales record for the State of New Mexico is suitable for testing this hypothesis. Data are available for 693 oral auction leases and 2,436 sealed bid leases covering the period January 1960 through December 1965. The best lands tend to be selected for oral bidding and yielded an average 56.68 dollars per acre with a standard deviation of 100.33 dollars. Sealed bid sales produced an average price of 27.85 dollars per acre and a much lower standard deviation amounting to 32.42 dollars. The difference between the standard deviation is statistically significant—well within the ninety per cent confidence interval ($T = 24.78$). These findings are consistent with the hypothesis.

As reported earlier, BLM shifted entirely from sealed to oral bidding by the end of 1955. The eighteen month record from July 1954 through December 1955 has been tabulated elsewhere.[40] From this tabulation, the following analysis was developed:

40. House Comm. on Gov't Operations, *Federal Timber Sales Policies* (Supplementary Staff Report), 84th Cong., 2d Sess. 244-45 (1956).

	Sale Type	
	Oral Auction	*Sealed Bid*
Number of sales	49	9
Average ratio of bid price to appraised price	1.70	1.79
Standard deviation	.59	.44
Number of one bidder sales	6	0

We find that sealed bid sales yield a slightly higher, but statistically insignificant, premium over the appraised price. The spread of premium bids around the mean values is greater, as suggested by the hypothesis. The difference is significant at the eighty per cent confidence interval ($t = 1.23$). Six of the forty-nine oral auction bids were at the appraised price as single bidder sales, while none of the sealed bid sales was transacted at the appraised price. The test based on New Mexico oil and gas leases confirms the second hypothesis. The test based on BLM data lends additional support, although the level of significance is not high.

IV
PUBLIC POLICY

Both bidding techniques are in extensive use. However, oral auction procedures are more widely used in bidding for timber resources while sealed bidding procedures are more widely used in the oil and gas resource markets. Oral auction procedures are used almost exclusively in the BLM Oregon timber sales program. Until 1948 sealed bidding procedures were used exclusively, under a Bureau directive.[41] A shift to oral bidding started in 1949 in response to industry requests, principally by private owners of logging roads used for access to public timber. "The oral bid was a concession to the road owner who gave access over his road so that the owner could 'protect his road.' " Further, "Land owners advanced the argument that they needed oral bidding to keep irresponsible bidders off their roads."[42] By 1955, eighty per cent of BLM sales had been shifted to the oral auction method and in that year the

41. Memorandum From the Bureau of Land Management to the Assistant Secretary for Public Land Management 1 (undated).

42. *Id.* at 2.

State Supervisor for Oregon directed that "oral bidding shall be the rule."[43]

The Forest Service *Manual* permits local discretion in the selection of bidding method:

> Timber may be offered through either sealed- or auction bid procedure. Other things being equal, the established prevailing practice in the region, sub region, or locality should be preferred. Departures from customary procedure may be made to foster community stability or to facilitate National Forest administration; requests for departures to favor an individual or class of bidder should be denied. The relative desirability of sealed- or auction bids should be considered as it applies to the conditions affecting timber disposal in each working circle.[44]

The selling method actually used by the Forest Service reflects regional pressures as in the Pacific Northwest (Oregon and Washington) where ninety and one-half per cent of all timber sales (1959-1962) were conducted under oral auction procedures and the remainder by sealed-bidding. Those sales transacted by sealed bidding were small sales averaging 1.2 million board feet compared to 4.9 million board feet for oral auction sales.[45] In the Northern Rocky Mountain region and in California, during the years 1962 and 1963, fifty-five per cent of all timber sales were by the oral auction method.[46] At the other extreme "in the Eastern United States sealed-bidding is the accepted practice. Auction bidding is seldom used."[47]

A. Preferences by Industry

The Western timber industry has a strong preference for oral auction bidding in the market for public timber. However, it has been shown that approximately one-third of all the national forest timber sales (1959-1962 in the Douglas fir region) were sold under noncompetitive conditions at the minimum acceptable price, and that where competition was effective a substantial premium (sixty-

43. Letter From State Supervisor, Bureau of Land Management, to All District Foresters, Portland, Ore., Oct. 18, 1955.

44. U.S. Forest Service, Manual § 2431.55 (undated).

45. Mead, *op. cit. supra* note 5, at 197.

46. U.S. Comptroller General, Report on Analysis of Certain Aspects of Bidding by Both Sealed-Bids and Oral Auction Bids on National Forest Timber in the Northern Region (Region 1), and the California Region (Region 5), at 6 (1965).

47. Letter From Orville L. Freeman, Secretary of Agriculture, to the Honorable William L. Dawson, Chairman, Committee on Government Operations, U.S. House of Representatives, June 10, 1965.

three per cent) was bid over the minimum price. In view of observed discrepancies dependent upon the effectiveness of competition, several studies have recommended that sealed bidding procedures be used in those areas where market structure and behavior clearly indicate inadequate competition and suggest collusive behavior.[48]

In response to criticism and suggestions the Department of Interior on May 14, 1965, directed its Bureau of Land Management in Oregon to apply sealed bid selling procedures on a ten per cent random sample of its future timber sales. The industry reacted with considerable alarm to this directive and the O and C Advisory Board in Oregon established a committee which held a series of meetings to examine existing studies of bidding results, to survey opinion, and to make its own comments and recommendations concerning the directive. In the course of these meetings industry presented unanimous opposition to sealed-bid selling procedures in general. The board of directors of the Western Wood Products Association (WWPA) unanimously voted to oppose the action. The WWPA, which is the largest regional lumber manufacturer's association, urged that the ten per cent sample decision be reconsidered on the grounds that "it is not justified nor in the best public interest."[49] In the Advisory Committee meetings where public opinion was sought, Mr. Ernest L. Kolbe, Director of Forestry Services for the WWPA, testified that:

48. A 1956 Report of the United States House of Representatives, Committee on Government Operations, recommended that the federal agencies give preference "to the use of sealed-bids rather than oral auction in order to maximize the opportunity for all potential bidders to participate and at the same minimize the opportunity for preclusive bidding." House Comm. on Gov't Operations, *supra* note 22, at 26. A 1965 report of the Government Accounting Office analyzed certain geographical markets where competition was felt to be weak and collusion present; it recommended that

> the Secretary of Agriculture and the Secretary of the Interior arrange for the Forest Service and the Bureau of Land Management to use sealed-bidding in their respective timber management areas where situations such as those noted by us exists, with the objective of fostering competitive sale conditions and thus obtaining for the Government reasonable competitive prices for public timber.

U. S. Comptroller General, Questionable Aspects of Oral Auction Bidding for Federal Timber Sold at Certain Locations in the Pacific Northwest 20 (1965). Alternative means of meeting the problem of inadequate competition in certain areas of the federal timber market were analyzed for the United States Department of the Interior. This report pointed out that "in 'areas of restrained competition' thus identified, the sealed-bid sale type may be used to elicit competitive bidding." U. S. Dep't of Interior, Memorandum on Competitive Bidding of National Forest Timber in the Douglas Fir Subregion 29, Sept. 17, 1965 (mimeo.).

49. Letter From John S. Richards, President, Western Wood Products Ass'n, to Stewart Udall, Secretary of the Interior, Oct. 7, 1965, on file in the Bureau of Land Management, Washington, D.C.

> We all feel very strongly that community stability is endangered by sealed-bidding when a man can't protect his plant. . . . We have a Forest Practice Committee that discusses forest industry problems and bidding procedures. Each and everytime the great majority of our membership prefer oral bidding. That includes the small operators in the Black Hills and the Rocky Mountain areas. There isn't a large operation in most of these areas, they are all real small. The fact is, they have been the driving force in our Association to have us go on record for oral bidding.[50]

As a result of its review the Committee of the Advisory Board recommended that "a sample of 10 per cent sealed-bids in the sale of O and C timber would serve no useful purpose, is not responsive to the General Accounting Office recommendations, and would be detrimental to the economy of the Pacific Northwest." The Committee recommended further that "the use of sealed bids should be resorted to only where a careful study of all factors in a particular situation indicates that desirable competition will result without harm to the economy."[51] As a consequence of the timber industry's strong reaction against the use of sealed bidding procedures, BLM elected to undertake alternatively a study of improved appraisal procedures with a view to increasing appraised values and recommended to the Department of Interior that the sealed bid sample program "be deferred for one full year after adoption of the new appraisal formula."[52] This recommendation has the effect of deferring action on the 1965 directive until at least mid-1968.

In the oil and gas industry, in contrast to timber, there is a strong preference for sealed bidding in the markets for publicly owned resources. Out of 26 interviews conducted with persons in the oil and gas industry, 5 expressed a preference for oral auction bidding and 21 for sealed bidding procedures. From an additional 67 interviews conducted with persons in federal and state government sales agencies, confirmation was obtained that the oil and gas industry strongly prefers the sealed bidding approach.

B. Industry Characteristics Leading to Opposing Preferences

An analysis of the characteristics of the timber and the oil and gas industries which lead to the foregoing preferences may be use-

50. O and C Advisory Board, *op. cit supra* note 27, at 2-3. For similar expressions of the timber industry point of view, see Craig, *Operators Dislike Sealed-Bids*, Forest Industries, July 1962, p. 39.

51. O and C Advisory Board, *op. cit. supra* note 27, at 7.

52. Letter From the Director, Bureau of Land Management, to the Secretary of the Interior, April 20, 1966.

ful in selecting optimum bidding methods for other situations. For example, in the near future a set of sales policies must be determined for disposal of oil shale resources. We may, therefore, ask what characteristics of the timber and oil and gas resource-based industries account for the observed preferences?

First, in the timber industry, fixed investments in milling facilities exist prior to sales, whereas in oil and gas a successful bid leads to subsequent investment in facilities, that is, drilling rigs, platforms, pipelines, and the like. Where investments in facilities exist prior to the sale, the buyer needs a means of insuring access to specific raw materials in specific locations. Oral auction provides this means through the opportunity to cast reaction bids. If a specific oil or gas lease is not obtained, the consequences are normally not significant. An exception may occur where a lease holder desires an adjoining "offset" lease to develop his holdings.

Second, in the timber case, the severed resource is highly immobile and therefore cannot be transported over a wide area. Logs are of great weight per unit of value, hence, a mill cannot import logs by truck or rail from a great distance if it fails to obtain a nearby sale. Crude oil, on the other hand, is easily and inexpensively transported to refineries from oil wells all over the world. Where the severed resource is immobile, it is of great importance that a specific nearby sale be obtained and the oral auction method thereby becomes more suitable.

Third, in the timber case, the individual sale usually is small relative to optimum mill capacity and, therefore, additional sales must be obtained frequently. The upper limit of the optimum size Douglas fir region lumber mill is about 60 million board feet per year.[53] The average sale size for national forest timber sales in this region is about 4.5 million board feet.[54] Therefore, an efficient mill, dependent entirely on public timber, would need to obtain about thirteen sales per year. In contrast, a successful oil field on a public lease may have a life of one-quarter century or more. Where sales must be obtained repeatedly in order for a processing facility to survive, the oral method of bidding is preferred.

Fourth, in the Douglas fir region, some firms are highly dependent on a single source of raw material and failure to obtain input from this source creates an acute log shortage for such firms. The shortage in turn may affect the related dependent community. The

53. Mead, *op. cit. supra* note 5, at 11-31.
54. *Id.* at 197.

Chief of the Forest Service Management Division in the Pacific Northwest testified that "The primary reason that we have used oral auction bidding rather than sealed-bidding . . . [since] the late 1940's, was . . . to give the local community an opportunity to protect themselves to a maximum extent."[55] Where several sources of raw material exist, failure in one area is less significant. The oil and gas industry has many alternative sources. The use of sealed bid procedures in the national forest timber markets in the East is explained by Agriculture Secretary Freeman as follows:

> The key difference between the situation in the Eastern United States and the Pacific Northwest is the degree of dependence of established mills on purchase of National Forest timber. In the East, there are typically alternate sources of timber supply. In the Pacific Northwest, many mills close to the National Forest have virtually no other source of raw material.[56]

Thus, specific resource dependency leads to a preference for oral auction bidding.

Fifth, the sealed bid method of selling introduces planning uncertainty. If a prospective buyer is limited by his financial ability in acquiring additional resources and therefore desires to commit himself to the purchase of one of ten simultaneous sealed bid offerings, he is unable to present offers after his success or failure is known on one or more of the ten. As a matter of sealed bidding strategy, a bidder desiring any one of ten simultaneous sales may increase his probability of success by making a very high bid on one sale, medium bids on several, or low bids on all ten. Depending on the reasoning of other bidders, he may be unsuccessful in any of the above strategies. Or, in the second or third strategy he may find himself successful in more than one and by the third strategy, all ten sales and thereby be placed in an over-committed position. Under the present simultaneous (non-serial) offering system, if sales are conducted exclusively by sealed bidding, a bidder of limited means cannot insure himself that he will not become over-committed to purchase more than one desired sale. Buyers in an industry such as timber, composed of relatively small firms would, thus, be handicapped by sealed bidding. The oil and gas industry is a large scale industry including firms with world-wide operations and vast finan-

55. O and C Advisory Board, *op. cit. supra* note 27, at 114.

56. Letter From Orville L. Freeman, Secretary of Agriculture, to the Honorable William L. Dawson, Chairman, Committee on Government Operations, U. S. House of Representatives, June 10, 1965.

cial resources.[57] The planning problem resulting from non-serial[58] sealed bid sales poses problems for any industry, but they are particularly great for small buyers. Thus, the planning problem and inadequate financing lead to a preference for oral bidding in a small firm industry.

Sixth, where prior existing fixed processing facilities are specialized and require specific species or grades of a given raw material, it becomes important to be able to obtain specific sales. Lumber and veneer-plywood mills are tending toward increased specialization. In oil and gas resources, not only is there no such specialization, but the bidder has no information about the quality of the hidden resource, and very little about its presence. Specific needs lead to the oral auction preference.

Seventh, oral bidding requires more decision making on-the-scene than does sealed bidding, and therefore requires that a higher level of talent be present at the auction. Lumber and veneer-plywood operations are relatively small and the owner-operator usually is present and bids at oral sales. In the oil and gas case where firms are relatively large, it is not practical to have the firm represented at auctions by the president, a vice-president, or other high ranking officers qualified to commit hundreds of thousands and in some cases millions of dollars. Sealed bid decisions can be made in regional offices and the company can be represented at sales by lesser officials. Hence, sealed bidding is more suitable for the large firm situation and oral bidding for small.

Eighth, the problem of the "free rider" is a problem for serious bidders under oral bidding conditions in both industries. In preparing to bid, the responsible firms in the timber market invest funds in cruising timber and estimating logging costs. In the oil and gas resources market, responsible bidding requires geophysical and geological surveys. In the case of submerged lands, these costs are relatively large. The identity of firms carrying on pre-sale explorations is normally known to others, though the findings are not. The free rider is one who does no exploratory work. He may use the funds saved to bid up those who do. He assumes that those who do

57. This industry includes also a large number of small firms and individuals, but most of them are not operators.

58. Serial sealed bid sales would not necessarily solve the planning problem. If timber sales were spaced one day apart, sales would be required daily with a consequent social cost in man hours.

resource surveys act wisely.[59] Where exploratory costs are relatively large, as in the case of oil and gas submerged lands, sealed-bidding is normally preferred.

CONCLUSION

As a matter of public policy for pricing of natural resources subject to disposal, a choice must be made between (1) oral bidding, (2) sealed bidding, or (3) some combination of these two methods. The optimum bidding method depends on three factors: (1) the effectiveness of competition, (2) the seller's ability to inexpensively fix a realistic refusal price, and (3) the basic characteristics of the specific buying industry.

Where the structure of the buying industry is monopsonistic or oligopsonistic and competition is unreliable, sealed bidding is the more appropriate method since it introduces a measure of uncertainty about who may appear as a bidder, and how much he may bid in his one-shot sealed bid. Oral bidding is vulnerable to collusive practices among bidders as well as to certain devices of unfair competition and emotionalism. Where buyers are few, some sales will be transacted at the minimum price because of (1) inadequate interest and "fishing" bids and (2) collusion. On the other hand, some sales will be bid-up beyond a reasonable value. The result is a somewhat chaotic pricing record, evident in a wide spread (standard deviation) around the mean value. Further, (where competition is unreliable) sealed bidding appears to yield a significantly higher price to the seller. However, where competition is reliable as a determinant of market prices, oral bidding may be suitable.

A refusal price that realistically reflects competitive prices becomes more important as the structure of the buyer industry becomes more concentrated (oligopsonistic). However, given technological limitations, some resources cannot be realistically appraised. Oil and gas resources are of this kind. Timber and oil shale resources are subject to more accurate appraisal.

The basic characteristics of buyer industries may constrain the public policy choice of bidding method. Thus, an industry that has an existing heavy fixed investment, uses raw materials that are relatively immobile economically, must acquire several successive leases or sales in the life of its fixed plant, is dependent on a single raw material source, must plan its purchases subject to severely

59. A bidder who engages in successful exploratory work may attempt to disguise his interest in the land by employing an unknown person to do the oral bidding on previously arranged signals.

limited financing, and requires that specific rather than random sales be obtained, will probably insist on the oral bidding method. Oral bidding is more suitable under these circumstances (or even a few of them) since it permits a buyer to react to challenges from other bidders and to protect his resource position. On the other hand, buyer industries operating under opposite conditions and, in addition, composed of firms too large to permit top management attendance at oral auctions, and finally, subject to relatively heavy exploration (pre-bidding) costs which injects the free-rider issue into bidding, will probably prefer the sealed bidding method. These are some of the important factors which must be weighed and considered in public policy determination of bidding method.