Book Reviews

James B. Ramsey, *Bidding and Oil Leases* (Greenwich, Conn.: JAI Press, 1980).

This book is an interesting collection of papers written in recent years on subjects related to bidding *and* (not necessarily *for*) oil leases. Reorganized somewhat unevenly into chapters, the main topics covered are the role of risk and government participation in the market for oil leases; the use of alternative bidding procedures and leasing systems in the auction market; and the implications for both firms and the government of a ban on joint bidding.

The premise is that the market mechanism in the form of a competitive auction is to be preferred in a social welfare sense to discretionary procedures for allocating oil leases. The individual chapters are primarily devoted to presentation of methods for finding case-specific parameters of an auction-type allocation system.

Chapter II accurately and clearly reviews the distinctions between risk, risk aversion, and uncertainty. Included is a brief summary of the debate over the proper interest rate for the government to apply in evaluating a risky project. Unfortunately, no attempt is made to relate the discussion to specific oil leasing

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policies, such as the discount rate to be used in OCS tract evaluations.

After considering in Chapter III the role of special-interest groups and the bureaucracy in formulating public policy, Professor Ramsey turns his attention to alternative bidding procedures in Chapter IV. The primary objective is to develop a decision theoretic bidding model and then to use it to compare results for two types of auction systems: high bidder pays second high bid (competitive auction) and high bidder pays high bid (discriminatory auction). Not surprisingly, individual bids are found to be lower under a discriminatory system. More importantly, it is established that this procedure generates greater receipts for the seller than the competitive approach when the auction consists of a relatively small number of high-wealth, low-risk-averse bidders.

The bidding model of Chapter IV is applied in Chapter V to issues related to joint bidding and in Chapter VI to alternative leasing system questions. About 100 extremely complicated bidding equations are produced in the three chapters; yet not a single numerical example is provided to help understand these equations. Although the theoretical results are somewhat equivocal, the author concludes that legalization of joint bidding increases the number of bids from auction-participating firms and encourages more firms to enter the bidding. Joint venture firms would also exceed those bids submitted by any one of the individual firms in the venture when joint bidding is prohibited. As a consequence, absent the sharing of bidding data on non-joint venture tracts, the seller's expected return is found to increase in the presense of joint bidding. Since current regulations prohibit the seven or eight largest U.S. firms from bidding together, it's unclear why the book doesn't focus on this particular policy-specific joint-bidding issue instead.

In discussing different leasing systems, Professor Ramsey equates a pure cash bonus bidding system (i.e., no contingency payments) to a peculiar type of declining royalty rate that somehow manages to extract, over the life of the lease, the same amount of rent paid to the government. In the deterministic scenario that he specifies, the only such system is one having the equivalent of a 100-percent pure profit-sharing rate. Even if such a system could be defined, the level of output would be indeterminate and the system would ordinarily not be equivalent to a pure cash bonus one. In evaluating profit-share bidding systems, Professor Ramsey concludes that in a competitive situation high bids will not discourage firms from minimizing costs and the failure to allow firms a normal rate of return (prior to sharing profits) will not affect production rates. In fact, bidders can, under some circumstances, benefit by simply incurring unnecessary or socially uneconomical costs merely to shelter profit-share payments from the government. Also, if the allowed rate of return is not set correctly, there is no assurance even under competitive conditions that the resulting profit share bid will generate the same post-sale production incentives as would occur with the correctly set normal rate of return. Obviously, all rents in both situations will accrue to the seller; however, the absolute amount of rents may differ in each instance.

Chapter VI also briefly considers how the optimal rate of leasing can be determined. Professor Ramsey would rely primarily on the number of bidders to signal both appropriate leasing rates as well as whether a specific tract should be leased. One problem here is reliance solely on the number of bids per tract to signal

market responses, rather than on additional factors such as price per lease and proportion of offered tracts receiving bids. Another is the failure to distinguish between the number of firms submitting bids, and the number of firms evaluating tracts but finding some of them not worth bidding on.

The book contributes to our understanding and appreciation of the problem in several ways. The review of the literature on topics such as risk, bidding theory, and competition is both illuminating and extensive. The author's development of his bidding model and mathematical proofs is quite lucid and elegant. In addition, it is unusual to find anywhere such a perceptive (though seemingly out of place) discussion of the function of special-interest groups, bureaucrats, and lawmakers in formulating public policy for energy resources.

On the other hand, the study is hampered by several shortcomings. Although one can infer both from John Sawhill's foreword to the book and from the framework of the bidding model that the actual focus is on bidding for federal outer continental shelf (OCS) oil and gas leases, nowhere is this made explicit in the text. Statistics, often out of date, are presented on foreign offshore, state offshore, and state onshore bidding results. Further, within the OCS context, no mention is made of the most important piece of legislation passed in the last 28 years: the Outer Continental Shelf Lands Act Amendments of 1978. Finally, the author spends much of the time proving rigorously nonrelevant and obvious propositions; important policy-related issues are discussed quantitively or not at all.

Despite these deficiences, however, I believe that analysts venturing into the oil-leasing field for the first time will find this book a useful addition to their reading lists.

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Committee on the Safety of Nuclear Installations, *Nuclear Safety Research in the OECD Area: The Response to the Three Mile Island Accident* (Nuclear Energy Agency and Organization for Economic Cooperation and Development, 1980).

This 50-page report was prepared under the aegis of the OECD Committee on the Safety of Nuclear Installations by a special working group with representation from 12 of the 24 countries, from the CEC (Commission of the European Communities), and from the Nuclear Energy Agency's secretariat. The intent was to review the extent to which the safety research programs had been reoriented in response to the accident at Three Mile Island.

A fundamental problem with this booklet is the disparity between its title and its contents. Although it purports to be a response to TMI, its answer leaves one asking, in Gertrude Stein's words, "In that case, what is the question?"

For the compilers of the report, two dilemmas existed. First, lack of research

had not been the cause of the TMI accident: no amount of prior research, as such, would have prevented it. Second, because some of the member countries are nuclear suppliers to other countries, there would be great reluctance, for commercial/political reasons, to acknowledge that anything about their nuclear programs required changing because of TMI.

The report is really a listing, amplified by brief descriptions, arranged in four main categories with 37 subcategories, of certain of the member countries' research programs in nuclear safety. In the text it is made clear that only a few of the projects were new beginnings undertaken, as the subtitle implies, *as a result of* the TMI-2 accident: most of them were either projects already underway before March 1979, for which modifications in the aftermath of TMI were unnecessary or irrelevant, or projects adjusted later on to include research into technical problems that would shed light on TMI.

It appears that the criterion used here for choosing the safety research efforts to include was whether that research would help in understanding or perhaps predicting the events that occurred within the reactor system during and after the accident, not whether it would help prevent the accident in the first place. In general, past research, research now underway – whether inspired by TMI or not – and research being planned for the immediate future are mentioned as long as the effort has some relevance to the TMI experience.

On the other hand, as I have already suggested, it seems clear that some nuclear safety research relevant to avoiding TMI was not mentioned in the report because of the sensitivity of some of the OECD countries about admitting a need to do such research – or, for that matter, a need to change their nuclear programs, or any part of them – because of TMI.

The report is subdivided into four categories: "Plant and System Behavior," "Improving Plant Operations," "Risk Assessment," and "Reduction of Accident Consequences," and multiple subcategories within that format. Thus the compilation should be useful to anyone with technical understanding of reactor operation and design who may want to ascertain what specific research related to the accident the member countries are doing, but it is not quite clear that any large fraction of the programs mentioned is in the nature of a "response" to TMI.

But perhaps that is not too important. It is generally agreed that institutional and personnel deficiencies were the major causes of the TMI accident. The official, self-critical U.S. sources – such as the Kemeny Report to the President, the Ragovin Report for the Nuclear Regulatory Agency, and the congressional hearings on the subject – make this point strongly. The official government reports and studies, and those of the utility industry as well, seem to agree that for over ninety minutes after the operators of TMI-2 knew they had a problem and shut down the reactor, they had it within their power to limit the size of the accident to something relatively insignificant (as measured in dollar costs), to 1 or even 0.1 percent of the actual multibillion-dollar price to be paid eventually for TMI. But the operators did not take the right action.

The main thrust of the research summarized in this volume is to understand in detail what was going on while the damage was occurring, to predict what would happen in similar circumstances with other reactors, and perhaps to predict how to modify reactor designs to avoid similar malfunctions. However, we already

know what triggered the accident. We understand what could have been done to minimize its consequences. We also know the many technical things that can be done to reduce the chances of triggering similar situations. Of the four categories of research projects listed in the report, the second category, "Improving Plant Operations," is the one that might deal with the causes of TMI. But such investigations need to be country-specific and often power plant–specific.

While, as the report indicates, the United States did initiate some new *research* to focus on the small-break loss-of-coolant accident (which is what the TMI accident is technically called), the major U.S. *response* has, justifiably, been institutional, operational, regulatory, and in the form of training personnel. Because the OECD report does not really address such responses, I believe its subtitle might better have been "The Relevance of OECD Nuclear Safety Research to the TMI Accident." Nevertheless, the very existence of the report is concrete and encouraging evidence of the exchange of technical information about safety research programs among the OECD member nations. This in itself can only be of mutual benefit for the participants and serves to support the 1973 decision to establish the Committee on the Safety of Nuclear Installations. But while, as the report indicates, the results of such research are being shared and are relevant to the technical understanding of TMI-type malfunctions, they could not be reasonably considered "the response" to TMI-2; a necessary element in the response, perhaps. I tend to question whether an authentic report with such a title could ever be written by an international body and retain its usefulness, considering the political hurdles that would have to be surmounted in order to prepare it.

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Daniel Park, *Oil & Gas in Comecon Countries* (New York: Nichols Publishing Company, 1979).

Now and then the reviewer is sent a book whose measure of contribution suffers because of an unavoidable loss of time between publication and review. This is one of those occasions. An examination of source citations in *Oil & Gas in Comecon Countries*, published in 1979, indicates that the bulk of the research was apparently completed by mid-1977, although there are scattered references in several tables to very early 1978 sources. Thus, what was then the future for the author has become the past for the reader. Few publications dealing with the highly transitory estimates of oil and gas supply and demand can withstand the test of any extended time.

Until the Central Intelligence Agency estimates of future Soviet oil production were made public in April 1977, oil and gas in the Soviet Union and in Eastern Europe merited very little attention, even though the USSR stood as the world's leading oil producer. The Soviet Union was not a force in the world's market, and

what it did have to sell was offered at prices and terms no different from those of competing suppliers. Only a handful of supply–demand analysts, employed by major oil companies or the intelligence services of the West, bothered with the regular collection and evaluation of statistics.

The sheer controversy of the CIA estimates changed all that, largely because of the immense political and economic ramifications that these estimates, if correct, would have for producer and consumer governments alike. However, Dr. Park's efforts were not born out of a stated desire to challenge the CIA estimates, although he notes his disagreement. His is a reference work, bringing together in clear, readable, and authoritative form an appraisal of oil and gas in the Comecon countries through the year 1976, together with a presentation of the 1976–1980 plan goals and a passing assessment of their feasibility. As much as we may want it to be, it is not a basis for an evaluation of the 1980s, and we would be doing a disservice to the author if we judged its contents upon what we now know about the Comecon oil and gas industry and how we perceive its future.

Dr. Park begins with an analysis of the development of the world petroleum market, 1960–1975, isolating the influences of consumer governments, oil and gas companies, exporting countries, and the Soviet Union. I was somewhat disappointed with the brief treatment given to the influence of the Soviet Union, which turned out to be more a brief summation of other studies covering the development of Soviet oil and gas during these years.

Next, attention is given to the postwar development of Soviet oil and gas, up to 1970. This subject, and like that of the following chapter, which takes these industries through 1975, has been covered amply in a variety of other sources. Similar treatment is given to the oil and gas industries of Eastern Europe.

Chapter 5, which follows, should have been the *raison d'etre* for publication of the book: a discussion of Comecon oil and gas, 1976–1980. But this time period is now history, and because of that, most of the subject's interest has been lost. So it is also with Chapter 6, which covers Soviet trade in oil and gas during the 1970s. Actual trade statistics are reported only through 1976, reflecting again not on the author but on the disparity we have mentioned above. For the remaining years, there is little to think about except a tabulation of estimates for 1980 prepared by different authorities. The latter makes for interesting reading, if only to ascertain who was wrong and who was right. Of the six sets presented (the author did not include himself, for some reason), only the efforts of E. E. Jack, J. R. Lee, and H. H. Lent, writing for the U.S. Joint Economic Committtee, provided reasonable estimates for both oil production and exports. However, these authors came in last in the competition in terms of forecasting 1980 gas production levels.

Had the author included his own thinking in this summation, he would have earned at least a passing grade. He overestimated both Soviet oil production (620 million tons) and exports (155 to 170 million tons)–although within quite acceptable limits–but was too pessimistic about natural gas production. His methodology is simple and straightforward, and unfortunately not applicable beyond 1980.

I found the chapter on Soviet relations with oil and gas producers to be the most provocative of any in the book, and its substance may perhaps take on more meaning than the author intended, as observers today try to determine whether

and why the Soviet Union might look to the Middle East for supplemental oil supplies. The future status of Soviet oil production is not yet a universally accepted matter, and any insight that can be provided is most welcome. Analyses tend to reflect judgments of future production on the basis of natural resource availability, but these writings caution us that cost/price and political factors may be just as important.

Dr. Park concludes with a summary analysis and a discussion of prospects to 1985. Any reader who might pick up the book for the first time will automatically turn to this chapter, to see where the author stands on that year. Unfortunately, this chapter is the least acceptable of any; it reiterates his limited analysis of 1980, now history, and except for a sentence or two does not address 1985 at all.

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Letter to the Editor

Comment on "An Assessment of the Effects of the Windfall Profits Tax on Crude Oil Supply"

To the Editor:

Philip Verleger argued in a recent *Energy Journal* article (Vol. 1, No. 4, October 1980, pp. 41–58) that "the Windfall Profits Tax offers incentives to [crude oil] producers on existing properties which exceed those offered by the free market" and that there is support for the conclusion "that the tax will actually induce an increase in U.S. oil production." While he admits "that the parameters used to estimate the supply response have such large variances that the results could be reversed," his claims are nevertheless sufficiently provocative to warrant examination.

The major point has to do with tertiary recovery. First of all, the extra output resulting from tertiary techniques is taxed at the 30-percent tier 3 rate rather than at the higher tier 1 or tier 2 rate.

The other, more important, feature of the tax is a reduced rate on a portion of the normal output for a property undergoing tertiary recovery that would have been taxed at either the tier 1 or the tier 2 rate.

The tax provisions allow a producing property to experience a normal decline in output of 1 percent per month, which is not unreasonable as an average decline rate for reservoirs in the U.S. experience. If a property is subjected to one or more of the tertiary techniques (and certified by the appropriate experts and officials), then the production that is taxed at the tier 1 or 2 rate is allowed to decline at 2½ percent per month. The production difference between the 1- and 2½-percent decline rates is taxed at 30 percent, as is the extra production from the enhanced recovery efforts. Thus, there is tax reduction on the normal output from the property as a result of achieving, as Section 4993(c)2(A) says, "more than an insignificant increase in the amount of crude oil which will ultimately be recovered" from tertiary efforts.

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For example, if one assumes the producer is "not independent" and the property is tier 1, and the price is $35 per barrel, then a 12-percent (annual) discount rate produces a tax savings that is 22 percent of the original amount, or putting it differently, a 78-percent decline in tax liability.

The tax reductions to independents would be lower because their windfall profits tax liabilities in all instances are fewer than those of nonindependents. However, the percentage reductions are about the same. For example, if the producer in the previous case were independent, the tax reduction would have been 81 percent.

The incremental realizations per barrel that a producer would earn from a tertiary project depend additionally on the extra output from the property. The extra revenue per barrel would be greatest for the smallest incremental output that nonetheless qualifies the property for the tertiary incentive. However, the production incentive extends only to the minimum amount necessary to satisfy the certification officials. Thus, there is no continuing incentive to produce from a tertiary project beyond the minimum acceptable amount. That makes any per-barrel estimate virtually impossible to generate.

The language of the legislation already casts doubt on the continuing certification of a project. Section 4993(c)2(E) says that the secretary must be satisfied "that the project continues to meet the requirements" of certification and that as yet unwritten regulations will govern that determination. It might be argued that the intent of Congress is clear and that sufficient flexibility would exist under the future regulations to ensure that the incremental tertiary output was maximized. However, the prospect of detailed supervision on thousands of tertiary projects raises the specter of an army of government inspectors and enforcers operating in an ever-changing regulatory environment.

The total effect of these considerations would seem to undermine the stability of the investment climate, perhaps to such an extent that less rather than more incremental tertiary output might be forthcoming compared with an unregulated free market. Certainly less output will be forthcoming from stripper wells. This heretofore exempt production is now subject to the Windfall Profits Tax.

Economists' instincts usually lead them to predict that when something is newly taxed, less of that commodity will be supplied in the future. Sometimes a tax regime can be fashioned, however, that converts some of the producer rents into a subsidy at the margin, resulting in an increase of overall output. But that does not seem to be the case with respect to the tertiary incentive in the Windfall Profits Tax. While categorical judgments at this time would be premature, it would appear that the Windfall Profits Tax is better characterized as adding to the marginal costs of primary, secondary, *and* tertiary recovery with the added feature of a lump-sum benefit in the form of reduced tax liability to operators of tertiary projects. Because only a minimum production threshold need be achieved, the lump-sum benefit would convert to a per-unit subsidy only in the unlikely case where the operator is without alternative investment opportunities.

A potential test that might discriminate between hypotheses is to track the output share of tertiary oil since the beginning of 1980, compared with production from one of the other tier 3 categories – say, "heavy" oil – to see if the series move together or if the tertiary output share increases relative to "heavy" oil. Compar-

ing the output shares for these two tier 3 production categories may be a better test than simply examining tertiary production rates alone. The latter would tend to reflect the change in market conditions for all oil. For either test, the data are readily available in the monthly entitlement notices appearing in the *Federal Register*. The testing could begin as soon as sufficient post-enactment data were reported.

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