

Book Reviews

Danny Hann, *Government and North Sea Oil* (New York: St. Martins Press, 1986), 177 pages.

Robert Mabro, Robert Bacon, Margaret Chadwick, Mark Halliwell, and David Long, *The Market for North Sea Crude* (Oxford: Oxford University Press for the Oxford Institute of Energy Studies, 1986), 341 pages.

These two books treat very different aspects of North Sea petroleum. They overlap by extensively covering British policies (Hann's sole concern). Mabro *et al.* also has detailed discussions of the industry itself and of the evolving spot market for North Sea crude oils and briefer discussions of Norwegian policies and the role of the North Sea in the world market. The analytic approaches are even more radically different. Such appraisals as Mabro *et al.* made are decidedly *ad hoc*. Hann relentlessly applies specific economic theories—those of politics and bureaucracy developed by such writers as Downs, Tullock, and Niskanen—to explain British North Sea oil policy.

Hann begins with a summary history of British North Sea oil and public policies and then turns to a survey of the theories he seeks to apply. His summary of the theoretical literature, with one serious exception, seems reasonable and clear. His effort to explain the critical proposition expounded by Niskanen that bureaucratic desires for more power lead to inefficiently high levels of intervention is confusing. Unclear equations and graphs present what a few words would have conveyed to anyone capable of understanding the material provided. The extreme case of bureaucratic featherbedding is undertaking all products with a nonnegative gross benefit—i.e. totally ignoring costs. A more moderate excess arises from equating total benefits to total costs. Given increasing costs, the output at which total revenues equal total costs is greater than the efficient output at which marginal costs equal prices.

The book seems more useful as a review of the policies than as an illustration of the utility of the theories. It provides a good overview of the preference for administrative determinations over competitive bids to allocate licences. Similarly, the history and problems of BNOC are well detailed. A particularly strong discussion is provided of the failure of either ruling party actually to implement its stated goal of devising rules for depleting the oil. The book's strength, however, derives from recognition of the more conventional economic arguments against government intervention. The tax chapter has somewhat less detail and a somewhat more elaborate analysis of the influences than those interested in oil might wish.

On the basis of Hann's discussion, the specific theories being tested appear far more applicable to licenses and taxes than to BNOC or production controls. The preference for licenses and complex taxes is consistent with the bureaucratic desire for more authority. The history of BNOC appears, by Hann's account, primarily influenced by ideological conflicts. This seems the type of political behavior for which an economic

theory of politics is least useful. It is most helpful in explaining why special interest groups succeed and adds little explanation of straightforward efforts to develop alternative models of what is socially optimal. However, the secondary influence of economic behavior by bureaucrats is relevant.

In contrast, Mabro *et al.*'s coverage of issues largely ignores licensing. They briefly note, but do not analyze, the failure to impose production controls. A few more details are given about BNOC, and its security of supply and information generating roles are appraised. Mabor *et al.* see BNOC as redundant for ensuring British access to the oil but view the information as useful. Just what appropriate policy would have been aided is not indicated. The book also provides a useful review of taxes. The tax discussion emphasizes but poorly analyzes the practice of tax spinning. The authors seem more concerned with the tax revenue losses than with the basic problem of correcting Tax Office tendencies to misvalue oil.

Better than a third of Mabro *et al.* is devoted to a useful compilation of information about the North Sea relating to reserves, output, physical characteristics of the oils from different fields, lifting costs and their dispersion, and international trade. Much of the material involves details about individual fields or companies. Two somewhat peculiar topics—concentration and seasonality of production—are selected for statistical appraisal. Concentration ratios and Herfindahl indexes are computed for companies in the British, Norwegian, and total North Sea in total disregard of the irrelevance of such ratios for a commodity with a unified world market. The efforts to explain seasonality unearth only that a major source of the fluctuation occurs in one field (Brent) that is also a heavy gas producer and times output to coincide with gas consumption movements.

Part III of the book provides a melange of data and assorted statistical analyses of another aspect of North Sea Oil—the Brent market—i.e., the emergence of spot and futures trading based on Brent crude. The data are more useful than their discussion; the general weakness of the economic underpinning of the book are necessarily most detrimental to analysis of an emerging spot and futures market.

The penultimate chapter presents useful summaries of statistical tests of price relationships such as between spot and term prices of Brent crude and Brent prices and Middle East prices. The final chapter ineptly tries to relate Brent crude to the rest of the world; again inadequate economic analysis is the problem.

In sum we have two useful but flawed contributions to the understanding of North Sea oil. Hann deliberately and wisely limited the issues covered; my main complaint is undue concentration on selected economic theories. Mabro *et al.* were more ambitious and provide considerably more information about the North Sea. As noted, the material needs much fuller use of economics than the authors undertook. The books are thus primarily of interest to specialists.

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Leach, Gerald, *et al.*, *Energy and Growth: A Comparison of 13 Industrial and Developing Countries* (Surrey, England: Butterworth Scientific, Inc., 1986).

Despite lower oil prices, the authors of *Energy and Growth* point out, with reason, that "the energy crisis has not gone away On the contrary, many developing countries are still afflicted by a triple energy crisis The first . . . is . . . paying for imported oil—and/or paying off the mountain of debts incurred by buying oil The second is the shortage of capital and skills for energy development Third is the fuel wood crisis which threatens the livelihoods of millions of people and the ecological resource base."

The purpose of this book, which compares the experience of thirteen countries at very different stages of economic development, is to provide a framework for the analysis of these issues. The treatment is both comprehensive and systematic. Emphasis is on the structure of demand in the major energy-using sectors, but closely related issues (such as fuel mix, energy production, imports and trade, and energy prices) are also covered.

Their energy system model is clearly explained and easy to adapt to other countries. The authors succeed admirably at gathering and collating a large, consistent energy data base. The presentation of the combined inter-country and time series data in the numerous figures is excellent and provides new insights into many aspects of the relationship between energy use and economic activity.

In comparing the energy intensities (i.e., energy consumption in relation to Gross Domestic Product) of developing and industrial countries, the authors, taking advantage of the pioneering work of Irving Kravis and his colleagues in the International Comparison Project, rightly convert the Gross Domestic Production of the thirteen countries from their national currencies to U.S. dollars using purchasing power parity, rather than market, rates of exchange. If comparisons are made using market exchange rates, energy intensities of industrial and developing countries turn out to be very similar. The use of purchasing power rates to convert GDP, however, increases the GDP of the developing countries relative to the industrial countries and therefore shows the industrial countries to be significantly more energy intensive.

Another improvement would have been to adjust energy consumption data for differences in average energy efficiency between the developing and industrial countries. While the appropriate fuel conversion efficiencies are imperfectly known, the direction of change seems clear. In a "real" energy GDP comparison, the disparity between the energy intensities of developing and industrial countries would increase even further.

The well-documented chapter on energy pricing compares differences in the structure and trends in energy prices between the thirteen countries. Caution is needed, however, in inter-country comparisons involving energy prices converted to dollars at market exchange rates with GDP in purchasing power parity dollars. A further point is related to the previous comment on conversion efficiencies. As the authors point out, kerosene prices are invariably much higher than fuel wood prices, but if these prices are corrected to take into account the differing conversion efficiencies, wood often turns out to be more expensive than kerosene.

The analysis of pass-through ratios in the chapter on pricing is particularly valuable. However, it would have been useful to suggest to the reader the expected ratio if the entire crude oil price increase had been passed through to product prices. The discussion does not recognize that for those products such as gasoline with large processing and distribution costs as well as high taxes, a full pass-through of the higher crude oil price might lead to only a very small increase in the pump price, since crude oil is in such cases only a small part of the final cost including tax.

The chapters analyzing energy consumption in the main end use sectors cover the main points efficiently and concisely. The authors note that in developing country households, wood fuel is considered an "inferior" form of fuel, with consumption frequently falling as income rises. As the authors point out, this finding vitiates those forecasts of fuelwood consumption based on constant per capita, or per household, use. The transport sector chapter provides striking examples of the declining energy intensity of productive transport, and the increasing intensity of private transport, as economic development takes place.

The book's stated purpose is to assist energy planning and policy formulation in developing countries. It could serve as a useful primer for *energy planners who need to analyze a country's energy sector and identify priorities*. It is not equally successful in assisting policy formulation—but perhaps that is too large an issue to deal with *comprehensively in a short, concise book*.

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B. Hickman, H. Huntington, and J. Sweeney, eds., *Macroeconomic Impacts of Energy Shocks* (Amsterdam: North-Holland, 1987), 332 pages.

This book reports the findings of the Energy Modeling Forum on the macroeconomic impacts of energy shocks. The focus is on the consequences for the U.S. economy of changes in energy prices, the extent to which macroeconomic policies can mitigate the associated price effects, and the comparison of econometric models. Overall, the book contains significant contributions to the literature in two areas: *The empirical modeling of energy-economy interactions and the methodology for comparing macro-econometric models*. It is also very well written and pays substantial attention to both detail and precision.

The editors organize the material into four papers and an appendix. The first paper, written by the EMF7 Working Group, uses simulation results of fourteen macro-econometric models of the U.S. economy to examine the impacts of energy shocks. The analysis focuses on the effects of energy price shocks on key macroeconomic variables, the extent to which these shocks produce linear responses, and the degree to which alternative policy responses (fiscal, monetary, energy) can mitigate the

adverse effects of these price shocks. The results reveal a certain degree of uniformity about the estimated magnitude of oil price shocks: On average, a 50 percent increase in oil prices lowers U.S. real income by 2.2 percent after four years. However, the models show less consensus about the role of policy in mitigating these price effects, with the uncertainty in model response being particularly pronounced for the case of lower investment tax credits. To account for these differences in model results, the paper compares the structural properties embodied in these models as summarized by the price elasticities of aggregate demand and supply. On the whole, the analysis is extremely useful. However, because the emphasis is on the United States, a country that is both relatively important in the world economy and largely self-sufficient in energy, the findings in the paper need not apply to other industrial countries.

The second paper by Bert Hickman develops a methodology to compare different models using both the price elasticities for aggregate demand and supply and the slopes of the IS and LM schedules. To estimate these parameters, Hickman relies on model simulations with oil price shocks, monetary expansion, and tax cuts. Intuitively, an oil price shock shifts the aggregate supply schedule and thus might be used to estimate the demand price elasticity as long as the demand schedule remains fixed. Following this methodology, the paper finds important structural differences across models, but it does not use these findings to elaborate on the implications for the formulation of macroeconomic policy. Furthermore, as Hickman recognizes, the price elasticity estimated with model simulations might differ from the *ceteris-paribus* price elasticity because a price shock could shift simultaneously both the aggregate demand and aggregate supply schedules. Despite these limitations, the analysis is very informative from a methodological point of view and provides a framework to conduct future model comparisons.

In the third paper, Hillard Huntington and Joseph Eschbach decompose the total loss associated with an oil price shock into a macroeconomic loss and a purchasing-power loss. Macroeconomic losses arise from the adjustment to higher energy prices, a process that involves increases in unemployment and declines in capital formation. According to the analysis, these losses represent 70 percent of the total loss and the losses in purchasing power, measured as the increase in exports that has to be devoted to secure the same amount of oil imports, account for the rest. This paper also contains a very interesting analysis of the benefits associated with maintaining the U.S. Strategic Petroleum Reserve (SPR). One limitation of the analysis, however, is that it assumes exogenously the magnitude of the response of oil prices to the reserve draw down. Generally, the size of this response is not known in advance and whether it actually takes place is central to the issue of maintaining the SPR. Nevertheless, the paper is very useful and it highlights the policy interactions at both the micro and the macro level.

The fourth paper, by Bert Hickman and Hillard Huntington, documents the design of the different simulations. After describing the construction of the baseline, the paper specifies the details for nine scenarios: four energy-price shocks, a monetary expansion, three different types of tax reductions, and a reserve draw down in the SPR. This paper usefully documents the kind of exercise that was conducted: Which variables were shocked and by how much; which variables were held constant in nominal terms and which ones in real terms. I think that it would be helpful to follow the style of this paper in future model-comparison projects.

The book concludes with an appendix, written by Jose Salinas and John Weyant, describing the structure of the fourteen models used in the study. These models differ in size, the structure of the energy markets (domestic and international), the specification of behavioral equations, and the macro-policy channels that are allowed to operate. To compare these models, the paper relies on two-way tables of model builders and model sectors. The latter are grouped into components of aggregate supply (i.e., production functions, productivity, etc.) and aggregate demand (i.e., consumption, investment, trade, monetary block, etc.). This appendix is a useful reference for model users.

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Richard T. Gordon, *World Coal: Economics, Policies and Prospects* (Cambridge: Cambridge University Press, 1987), 145 pages.

This slim volume continues Gordon's several analyses of and approach to coal industry problems. The perspective is deliberately selective, idiosyncratic, with often summary treatment of coal topics. His thesis here is that coal output growth will depend on regional steel industry demand for coke and steam electric power, coal's residual markets, but foreseeably will not become the preeminent fuel. A deceptively simple style masks the strength of his economic statements. This is not a book for newcomers to coal or energy; it is also helpful to be familiar with Gordon's earlier work. He claims (p. 4) that many aspects of coal are so diverse, localized and/or specific that analysis must be extremely general or detailed. This can be said of many traded commodities, but the world implicitly solves the trade matrix, and economists try to reduce chaos to explanatory variables.

Gordon relates coal and energy. Coal categories are defined as are coal processing and technology. The first determines coal use and markets. The last decreases cost and increases reserves. He reminds us that coal cost as burned is the relevant comparator. Given transport, mining costs must be low, the resulting mineable reserves must not be confused with resources for interfuel comparisons. Coal cleaning is presented as a trade-off between transport costs and heat content, but the relation to pollution control costs and the economic cleaning limits are not explored. For transport, mine mouth power generation is noted and coal slurry pipelines are claimed cheaper than rail for high volume long distance shipments. However, electric transmission costs are not explored and existing work demonstrating high relative costs of new slurry lines versus upgraded existing rail lines is ignored. Gordon claims that scale advantages consign much coal to steam electric generation (where its penetration is limited by nuclear power) but he provides no analysis of nuclear subsidies, and no analysis of bilateral monopoly elements in steam coal pricing. However, the economics of

mineral resource development is neatly done and the comparison between the cartel and exhaustible resource models offers a basic refutation of Hogan, *et al.*, regarding proposed U.S. oil import fees.

The author provides a description of the trends and directions of OECD coal consumption followed by trends in coal production and trade patterns. European consolidations, nationalizations, contracts and sales arrangements are described. The U.S. industry is deemed competitive, but issues of long-term contracts and captive mines are not fully addressed.

For the nonspecialist, the presentation of coal in Communist countries (Chapter 5) is most interesting. Coal is only one energy form, and the diversity of fuel production/consumption trends among the CMEA countries is stressed. China is separately presented. The USSR is presented as a paradigm of energy development problems: concentration on resource size, productivity location, fuel quality, and centralized mismanagement. Neither intra-CMEA trade nor exports are analyzed.

U.S. coal policy issues are summarized but provide a good opening for policy analysis. The leasing problem is featured. As residual oil was added to the embargoed petroleum list in early 1960 especially to protect eastern coal, it is surprising to find coal described as an incidental beneficiary of U.S. oil import controls.

Analysis of western European coal developments provides an excellent discussion of national protection, subsidies and their industry impacts. This perspective can be read as an indictment of protection (e.g., U.S. import fee proposals). Government nationalization, ownership or involvement in fuels and electric power enables the provision and concealment of coal subsidies (p. 71), an argument that is not raised for competing European nuclear power (pp. 72, 74).

The role of governments, their taxation of rents, regulatory inefficiencies and contradictions is shown for the export producers: Australia, South Africa, Colombia and Canada (Chapter 8). The result is excess export capacity at existing and foreseeable prices, but absent a transport analysis the competitive relation among the exporters is not completely developed.

Coal prospects (Chapter 9) stress appraisal problems. Scenario based analyses are justified with the OECD emphasized as the inter-fuel battleground. Expectations are problematic due to E. Bloc uncertainties and reduced U.S. electricity forecasts resulting from regulatory constraints. Given excess capacity the latter is an oversimplification.

In view of existing forecasting problems, a useful analytic approach based on economic analysis and market behavior is presented. Unfortunately, Gordon stresses the difficulties and the often poor forecasting results. Existing coal models are questioned, but Gordon does not provide guidance for improvements. If, as he suggests, coal cannot be forecast in isolation, one purpose of this volume may be questioned.

His future implications for coal are primarily based on a qualitative gloss on IEA and Chase Manhattan forecasts. For the U.S. a high nuclear forecast is implicit. We are cautioned on the difficulty of supplying precise estimates of location of supply and demand. Furthermore, the brief conclusion (Chapter 10) is that coal developments are highly uncertain and that nothing critical depends on waiting for the answers. Presumably this is directed to policy rather than to decision makers.

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