OPEC: Market Failure or Power Failure?

Robert D. Cairns* and Enrique Calfucura
Department of Economics and CIREQ
McGill University
855 Sherbrooke St. W.
Montreal QC Canada

*Presenting author: robert.cairns@mcgill.ca
H: 514-487-5391

Abstract

In the past thirty and more years, economic models of the behavior of OPEC and the world oil market have been presented as direct applications of the theories of oligopoly and of exhaustible resources. The stylized facts of these models are highly consistent. The actors are portrayed as producers of a homogeneous product. The level of reserves of each actor is known and fixed. Their capabilities and costs are given. Their objective is to maximize their discounted profit, subject to the actions of their rivals. In maximizing present value, the actors attempt to exert market power through adjustment of current output. Exhaustibility of their own and of their rivals’ reserves dominates the determination of dynamic equilibrium. Consequently, a central role is played by Hotelling’s rule, that marginal revenue net of marginal cost must rise according to an r-percent rule, an arbitrage condition for units of the resource in situ.

Many econometric investigations have attempted to check the validity of the models. In the aggregate they have been inconclusive. For example, careful econometric studies by Smith (2005) and Kaufmann et al. (2008: 348) find conflicting explanations of OPEC behavior and conclude that OPEC does not fit a single economic model.

The present paper takes some small steps from the theoretical models in an attempt to reconcile the economic perceptions of the world oil market and the role of OPEC. First we consider the implications of dynamic optimization in a strategic context, with discounted profit as the objective. One small step is to think in terms of a disaggregated technology for the incentives and choices facing the main producers. This part of the paper addresses the main issue of the paper. It is analytical but conceptually more detailed than standard models, as it is grounded in technical and natural features. In light of these features, the second part of the paper proposes a more flexible, political-economic, objective for the main actor, Saudi Arabia. It leads to a narrative about the industry based on other theoretic approaches than Hotelling models. The aim is to improve understanding of the industry rather than to produce a predicted path to estimate and to test.
These small steps are based on geology and on political-economic considerations having to do with the countries and their relationships with their national oil companies (NOCs). Like a slight turn of a kaleidoscope, the small steps re-form market patterns, retaining some familiar aspects but being different enough to suggest why empirical work has found inconsistencies. Given the legendary secrecy of OPEC and its component regimes, shedding some light in this way may be the best that outside analysts can do.

The assessment advanced is that all producers but one act as price takers, but not as the price takers in a “Hotelling” model. Instead, they are strongly constrained by technology and nature. At times the main producer in OPEC, Saudi Arabia, does not act as a price taker. But its interests differ from those of a profit-maximizing price leader or cartel participant. Considerable qualitative information leads us to propose that the policy that Saudi Arabia ought to pursue in its own interest is very close to one of OPEC’s recent policies, namely, attempting to keep price within an acceptable band. In particular, its interest is not in raising the price to extract monopoly rents but to restrain the price to conserve its market in the long run. Restraint is a classic policy of a dominant minerals producer with large, high-quality reserves. Hotelling scarcity rents arising from the exhaustibility of oil are insignificant.

The paper does not have a single model of OPEC. The subject is too broad and has too many facets to be covered by a single economic model. The paper is a narrative that tentatively borrows from and extends a number of economic models. It discusses aspects of OPEC’s decisions that include the technology of production, the political-economic attributes of the producers, especially Saudi Arabia, and the role of peak oil. We try to put together a composite sketch from many independent witnesses.