

ASSESSING THE IMPACT OF HIGH RESOURCE PRICES AND ALTERNATIVE ROYALTY REGIMES ON OFFSHORE GULF OF MEXICO OIL AND GAS ACTIVITY

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Overview

Resource (oil and gas) prices and fiscal policy initiatives are two important drivers of exploration activity in the Gulf of Mexico. Spot oil prices have nearly quadrupled in the past four years, while natural gas wellhead prices have almost doubled. In addition, the Federal government continues to pursue alternative royalty regimes designed to simultaneously stimulate offshore oil and gas exploration and ensure royalty revenue collection from offshore oil and gas field production. Litigation concerning the applicability of price thresholds on offshore royalty collection are likely to result in the significant loss of royalty revenue for leases issued between 1996 and 2000. As a result of the rapidly changing political, economic and legal changes within the petroleum industry, exploration companies, operators, policy makers and other petroleum industry personnel need to be able to effectively quantify the incremental impact of different changes in both resource prices and federal policy on future exploration, development and production expectations.

Typically, increases in resource price and/or royalty relief programs stimulate leasing activity and subsequent exploratory well drilling in the Offshore Gulf of Mexico. As a result, improved field economics resulting from high resource prices and favorable royalty regimes will lead to the development and production of new resources more rapidly than in situations with low resource prices and the absence of federal policy initiatives. However, empirical evidence indicates that the benefits of federal policy initiatives tend to apply mainly to marginal fields, which might not ordinarily be developed under prevailing economic conditions. Furthermore, confusion about the applicability of price thresholds and potential alternative regimes raises questions concerning what the future might hold for offshore oil and gas exploration, development and production activity in the Gulf of Mexico. Therefore, it is useful to assess potential forecasts of offshore activity under different price and policy scenarios. In addition, changes in drilling and operating costs in response to price increases also influence offshore operating economics. To assess the future implications of high resource prices, increases in costs and federal policy initiatives, I modeled several different forecasting scenarios using the IIC EDP model – a comprehensive forecasting model developed for the Minerals Management Service. By assessing the differences in model outputs, I quantify the incremental benefit of varying resource prices, costs and royalty regimes.

The paper is organized as follows. After the introduction, the second section covers a brief overview of the IIC EDP model and forecasting methods. The third section provides an overview of recent trends related to resource price, drilling and operating costs and federal royalty relief regimes. The fourth section details the results of the forecasting analyses under the assumptions and price scenarios outlined in response to the observed trends of section three. The final section assesses potential policy and industry implications, including a discussion of avenues for model and forecasting improvement and future research.

Methods

The EDP model is an expected value simulation designed to forecast offshore exploration, development and production activity over a forty-year cycle. There are significant input levers which allow the user to specify key economic and policy variables for each individual forecast. In this research, I provide a differential analysis of forecast results, generated by varying input assumptions related to resource price, drilling cost and royalty relief regimes. The results provide an overall indication of offshore exploration, development and production activity, but also quantify the differences in output variables based on changes in specific input assumptions.

Results

The research results provide an overview of the sensitivity of the model forecasts related to changes in resource prices, drilling costs and royalty relief alternatives. Several key conclusions include:

Higher resource prices lead to improved field economics and stimulate offshore exploration, development and production activity.

Changes in resource price are the predominant driver in offshore exploration, development and production activity.

Increases in drilling and operating costs tend to dampen offshore exploration activity through reduced field economics.

Implementing royalty relief leads to improved field economics and increases in offshore exploration, development and production activity.

Royalty relief tends to stimulate the development and production of marginal fields.

Over an extended time horizon, royalty relief leads to an escalation of short-term exploration activity, but leads to a significant decline in royalty revenue.

Conclusions

The future of offshore oil and gas exploration, development and production activity is primarily driven by increases in resource price and drilling and infrastructure cost. As key inputs into the field level economics, increases in field profitability will stimulate increases in exploratory well drilling. Federal policy initiatives designed to provide royalty relief also lead to improved field-level economics and stimulate exploratory drilling. Implementing alternative royalty regimes that reduce or increase royalty relief do not appear to have an incrementally significant impact in periods of high resource prices.

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