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STUDY TITLE: Effects of Crude Oil Price Instability on OCS Oil and Gas Development and the Economic Performance of the U.S. Coastal Gulf States

REPORT TITLE: Economic Effects of Petroleum Prices and Production in the Gulf of Mexico OCS on the U.S. Gulf Coast Economy

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SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREA: Western, Central, Eastern

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COSTS: FY 2001: $69,656.94; FY 2002: $18,724.06; CUMULATIVE PROJECT COST: $88,381.00

PROJECT MANAGER: O.O. Iledare

AFFILIATION: Louisiana State University, Center for Energy Studies

ADDRESS: Energy, Coast & Environment Bldg., Nicholson Extension, Baton Rouge, Louisiana 70803

PRINCIPAL INVESTIGATOR: O.O. Iledare

KEY WORDS: Gulf of Mexico; OCS; economy; petroleum prices

BACKGROUND: The Gulf of Mexico (GOM) OCS region produces about 25% of the oil and gas production in the country. Despite its importance, only few economic impact studies have focused on the economic effects of petroleum market variables, especially oil price instability, on GOM communities. Perhaps the most important variable in the oil market is crude oil prices.

There is a general consensus that declining oil prices stimulate economic growth while increasing oil prices tends to dampen economic performance; the effects are not generally conclusive, however, for sub-national economies. While the effects of changes in oil price structure on the U.S. national economy are generally understood, the impacts of such changes on the state or sub-regional economies are less fully examined. Very few studies have studied the impact of changes in crude oil price on state economic performance, and such studies tend to conclude that a rising oil price more often than not stimulates economic growth in oil exporting states and hinders growth in oil importing states. The converse is true for declining oil prices.

For effective policy and regulatory guidance within the context of the overall national energy policy, government agencies need reliable information at the regional levels,

where most relevant oil and gas activities take place. This is because each state or region often possesses unique characteristics that are at variance with national outlooks. Therefore, such unique situations require a different policy or regulatory framework. Accordingly, this study is proposed to fill these gaps by extending previous national studies to sub-national economies, especially to areas where MMS has jurisdictional mandates.

OBJECTIVES: This study develops economic and econometric models that examine the effects of changes in crude oil prices on both the E&P activities of the OCS oil industries and the relevant regional economies in the Gulf of Mexico. The research uses recent econometric tools to provide quantitative estimates of the responsiveness and correlation between past and current activities of the oil industries and Gulf States' economic growth and oil price changes and volatility.

Specifically, the following objectives are addressed:

1. examine the changes in some specific economic indicators of E&P activities of the OCS oil industries as a result of oil price changes and price volatility over time;

2. examine the type of relationships that exist between oil price changes and the level of economic activities of the Gulf Region;

3. forecast potential impacts of future changes in oil prices on industry activities and state aggregate economic variables; and

4. identify possible public policy response to the level and direction of response to these changes by the industry.

In order to meet the above challenges, recent developments in time series econometric modeling tools are employed. These tools enable us to establish the direction, causation, duration, responsiveness, and correlation between industry and states' economic activity indicators and oil price changes over time.

DESCRIPTION: This study covers selected representative states in the GOM Region. Specifically, we selected the following states based on their unique structural and economic characteristics.

Louisiana: Represents net oil exporter with limited diversified economy;

Mississippi: Represents net oil importer with limited diversified economy;

Texas: Represents net oil exporter with relatively diversified economy;

Alabama: Represents net oil exporter with limited diversified economy.

In terms of industry-level, the project focuses on two levels of activities. First, at the aggregate level the study examines oil price impact on industry and state-level macro-

aggregates using industry activities for the entire OCS in the GOM. It is hoped that the results of such analysis will provide a broad picture of the potential impact of oil price driven policy variables of OCS activities and the individual state. Second, because MMS policy often focuses on individual planning area or water depth, the study repeats the same exercise at a more disaggregated level of industry activity in the deepwater.

SIGNIFICANT CONCLUSIONS: Two major observations are evident in this study. First, contrary to our initial hypothesis, the effects of an oil and gas price shock on coastal Gulf States are more direct than indirect (through oil and gas production). In other words, employment, personal income, and revenue are impacted more directly following a price change rather than through changes in oil and gas production following a price shock. Second, although there is a direct effect of price change on oil and gas production in the Gulf in general, these impacts differ significantly by water depth. Further, according to our empirical results, there is a strong statistical evidence to suggest an asymmetric response of each of the three macroeconomic variables to price in the four coastal Gulf States.

STUDY RESULTS: The study shows that:

Unemployment rates in coastal Gulf States in the U.S. tend to decline in response to increases in petroleum prices. It is interesting to note, however, that the responsiveness of unemployment rates to changes in prices differ significantly across the Gulf States. Texas has the least unemployment responsiveness to a price shock and Alabama has the highest among the four Gulf States.

According to the VAR model results, personal income tends to increase following a positive shock to petroleum prices in the presence of rising petroleum production. The degree of income responsiveness to price shocks varies across the U.S. Gulf States. In general, personal income responsiveness in TX is greater than that of MS, LA, and AL in that order. The empirical results also suggest that the Texas economy, because of its size, tends to experience a more lingering path to adjustment for personal income than LA, MS and AL. Similarly, personal income in LA tends to experience more lingering effects than MS and AL following a petroleum price shock.

Positive changes in petroleum prices lead to increases in annual revenue in LA, TX, and AL. The responsiveness of revenue to price changes, however, varies across Gulf States just as changes in unemployment and personal income vary across the Gulf States.

Surprisingly, unemployment rates in the Gulf States appear to be relatively less sensitive to production activities in the Gulf States than expected. In many instances, the direct impacts of changes in production on unemployment rates are insignificant.

Finally, there is statistical evidence suggesting significant differences in the duration of the lingering effects of a price shock on the economic performance of the Coastal Gulf States that were investigated in this study.

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