# Do Markets Price the Sensitivity of Economic Oil Reserves?*

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## Abstract

Climate action will make the production of carbon resources less profitable, reducing economically exploitable oil reserves and their value, with implications for the climate, the oil industry, and its investors. In this paper, we measure the sensitivity of economic oil reserves and study the role of this sensitivity in oil companies' market valuation. Conventional financial analysis already estimates oil companies' exposure to oil price changes, among other factors. Yet we claim that the standard model focuses on the impact of oil prices at the intensive margin and ignores changes in economic reserves. First, we present a theoretical decomposition of the effect of an output price on a firm's value through the intensive and extensive margins, which we use to extend the conventional analysis of how oil price movements affect oil companies. We obtain a new testable model relating oil companies' expected stock returns to both oil price fluctuations and the elasticity of economic oil reserves. We validate this model by exploiting financial data. The model improves the prediction of expected stock returns. Second, we measure the elasticity of economic reserves to the oil price by exploiting oil reserve data. We obtain time-varying Local Elasticities of Economic Reserves (LEER) of oil companies, a new metric. Third, we use LEER measures to explain oil companies' stock returns. Our results indicate a significant LEER-premium, accounting for up to more than half the industry's average excess stock returns. This means that the risk associated with more sensitive economic reserves is material to investors who demand compensation from oil companies for the possibility of stranded assets.

*Keywords:* Economic oil reserves; Stranded assets; Oil price risk; Risk premium.

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