

A REVIEW OF THE LITERATURE ON COMMODITY RISK MANAGEMENT WITH A FOCUS ON ENERGY RISK MANAGEMENT

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Overview

This paper analyzes research on commodity risk management by nonfinancial firms and provides a review of the findings to date. In particular, research on energy risk management will be discussed, such as studies that have explored oil and gas companies hedging using oil and gas derivatives and airlines use of energy derivatives. We discuss the methodologies used including the models best suited for examining commodity risk management and exposure.

In this study, we investigate how the research to date provides evidence to help answer the following questions. Question 1: Is commodity risk reflected in share price behavior? Question 2: Is the use of commodity risk management tools (derivatives) associated with reduced risk? Question 3: Is there a relationship between the use of commodity risk management and the value of the firm? Question 4: Are there other factors that impact a firm's decision to manage commodity price risk? Suggestions are provided for future research in this area.

Methods

To answer Question 1: Is commodity risk (such as for oil price risk) reflected in share price behavior?, researchers most often employ the market model by specifying a linear relationship between the rate of return on a particular equity, R_i , and the rate of return of a commodity price (such as the return on the oil price), R_b , while controlling for the market portfolio, R_m as shown in the equation 1:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \gamma_b R_{b,t} + \varepsilon_{i,t} \quad (1).$$

The market model is a way of dividing the firm's risk into two different sources. The parameter, β_i , captures the variation in risk due to changes in the broad stock market while the exposure to commodity price risk is measured by γ_b . If γ_b is different from zero, this provides evidence that the firm is indeed exposed to commodity price risk.

To investigate Question 2: Is the use of commodity risk management tools (derivatives) associated with reduced risk?, the most frequently used technique is to investigate whether the use of derivatives affects the size of the exposure coefficient, γ_b . For Question 3: Is there a relationship between the use of commodity risk management and the value of the firm?, Tobin's Q is the most frequently used measure of a firm's value in research to date. If there is a positive relationship between commodity risk management and the value of the firm while controlling for other factors, then this provides support this commodity risk management adds value.

Econometric models used in research to date include many models which are discussed in the paper.

Results

First, positive support is found for Questions 1 and 2, including for companies exposed to energy prices, both as inputs (users such as airlines) and outputs (such as upstream oil and gas companies).

Second, while positive evidence has been found for Question 3 as to commodity risk management adding value, the evidence is mixed. A detailed discussion is provided in the paper.

Third, the most recent research for Question 4 explores other factors impacting commodity risk management including operational hedges, corporate governance structure, managerial overconfidence, product market dynamics, and cash holdings, among others.

Conclusions

The findings of research to date show that commodity price risk can affect the returns on stocks and that commodity hedging can reduce this exposure. Regarding the question as to whether commodity risk management adds value, the results are mixed. In particular, strong evidence is found that commodity risk management adds value for firms hedging input price risk. Regarding hedging output price risk, the results are mixed. Overall, our study shows that more research is needed in the area of commodity risk management, particularly in the area of energy risk management. A number of working papers are continuing to explore these issues but more research is still required to answer these important questions. Our paper provides a few suggestions to researchers interested in exploring these topics.

References

Note: There are many references in our paper. Below are a few examples.

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