

# Does “Paper Oil” Matter?

## *Energy Markets’ Financialization and Equity-Commodity Co-Movements*

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### **Abstract**

We construct a uniquely detailed, comprehensive dataset of trader positions in U.S. energy futures markets. We identify considerable changes in the make-up of the open interest between 2000 and 2010 and show that these changes impact asset pricing. Specifically, dynamic conditional correlations between the rates of return on investable energy and stock market indices increase significantly amid greater activity by speculators in general and hedge funds in particular (especially, funds active in both equity and energy markets). The impact of hedge fund activity is markedly lower in periods of financial market stress. Our results support the notion that the composition of trading activity in futures markets helps explain an important aspect of the distribution of energy returns, and have ramifications in the debate on the financialization of energy markets.

### **Extended Abstract**

In the past ten years, financial institutions have assumed an ever greater role in energy futures (or “paper”) markets. We provide novel evidence of this “financialization” and show that it helps explain an important aspect of the distribution of energy returns.

A number of recent studies examine the respective roles of economic fundamentals and financial speculation on oil price levels. We focus on another element of the distribution of energy returns: the extent to which they move in sync with stock returns.

We start from the intuition that, if many commodity market participants face restrictions on their choices of trading strategies, then an influx of financial traders subject to fewer trading constraints should help alleviate price discrepancies and improve risk transfers across markets. In normal times, this theoretical result and the fact that hedge funds are less constrained than other investors together imply that greater hedge fund participation should boost cross-market linkages. As well, in periods of financial market stress, suppose that value arbitrageurs and convergence traders face borrowing constraints or other pressures to liquidate risky assets. Then, their exit from “satellite” asset markets (in our case, energy paper markets) after a large shock in

a “central” market (in our case, U.S. equity markets) could in theory bring about cross-market contagion. In turn, reduced activity by such traders in the aftermath of the initial shock could lead to market decoupling.

Taken as a whole, those arguments suggest that the composition of trading activity (i.e., *who* trades) should matter for energy returns and that financialization should affect cross-market linkages differentially in periods of stress. We provide empirical support for these hypotheses. Controlling for macroeconomic and energy-market fundamentals, we document that energy-equity co-movements are positively related to greater energy market participation by financial speculators in general and by hedge funds in particular – especially, by hedge funds that take positions in *both* equity and energy futures markets. We show that the impact of hedge fund activity is complex. In particular, it is weaker during periods of turmoil in financial markets.

Key to our contribution is our unique dataset. In general, investigating whether specific types of traders contribute to cross-market linkages is empirically difficult because doing so requires detailed information about the trading activities of all market participants as well as knowledge of each participant’s main motivation for trading. We overcome this critical pitfall by constructing a daily dataset of individual trader positions in U.S. futures markets for energy (crude oil, heating oil, natural gas) and equities (S&P 500 e-Mini). The underlying data are not public: they come from the U.S. Commodity Futures Trading Commission’s (CFTC) large trader reporting system. The CFTC collects information daily on the positions of every large trader at the close of each of these markets, as well as information on each trader’s purpose for trading and main line of business. On average, our dataset covers the individual positions of more than 83% of the total open interest in the largest U.S. energy futures markets between 2000 and 2010.

In this last regard, we make three contributions. First, we provide a decade’s worth of uniquely detailed information on the growing importance of financial traders in three major energy futures markets. Second, we document that several types of energy futures traders (especially, hedge funds) also trade equity futures and show that such cross-market trading has grown substantially. Third, we use this novel data to investigate the impact of this financialization on cross-market linkages.

We find that variations in the composition of the energy futures open interest help explain long-term fluctuations in energy-equity return co-movements. We establish this result *via* ARDL regressions that include lagged values of the variables in the regressions to tackle serial

autocorrelation and endogeneity issues (due to the possibility that speculation could increase amid high volatility and correlations, rather than the other way around).

In contrast, we find that the positions of other categories of energy traders (e.g., swap dealers and index traders; energy producers, refiners and dealers;...) has little explanatory power for dynamic conditional equity-energy return correlations. Furthermore, it is not simply changes in energy speculation that helps explain the observed correlations. Rather, the explanatory power can be traced more narrowly to the activities of one type of speculators – hedge funds, especially those that are active in *both* equity and energy futures markets.

We document that financial market stress affects energy-equity linkages in two ways. First, energy-equity return co-movements are positively related to our proxy for stress, the TED spread. Intuitively, hedge funds could be an important transmission channel of negative equity market shocks into the energy space. In fact, the sign of an interaction term we use to capture the behavior of hedge funds during financial stress (“high TED”) episodes is statistically significant and negative. In other words, the impact of hedge fund activity is reduced during periods of financial market stress.

Second, we show that energy-equity correlations soared in the Fall of 2008 after the collapse of Lehman Brothers and remained exceptionally high until the end of 2010. Over and above the explanatory power of the TED spread, a time dummy that captures the post-Lehman period is highly statistically significant in all of our model specifications. This finding suggests that the recent crisis is qualitatively different from previous episodes of financial market stress and that this difference is reflected, in part, by an increase in cross-market correlations.

The remainder of the paper proceeds as follows. Section I places our contribution within the literature. Section II provides evidence on energy-equity linkages. Section III presents our data on trader positions and documents the financialization of energy futures markets. Section IV contains regression analyses tracing changes in the strength of energy-equity co-movements to market fundamentals, financial stress, and hedge fund activity. Section V concludes.