

News Media and Attention Spillover across Energy Markets: A Powerful Predictor of Crude Oil Futures Prices

Oğuzhan Çepni,^a Duc Khuong Nguyen,^b and Ahmet Şensoy^c

Crude oil is one of the most important commodities globally as it goes into the production of gasoline, jet fuel, and many other petroleum products and chemicals. As an essential source of energy, it also plays a prominent role in the economic activities of nations worldwide. Therefore, the question about oil price driving factors has attracted considerable attention since a reliable forecast of oil prices is of great interest to various stakeholders. However, with the financialization of oil commodities since the early 2000s, the underlying forces that drive oil prices have become more complex, making the information from fundamentals insufficient. Thus, oil price forecasting is now more challenging than ever.

Within this context, our study aims to assess the role of investor attention in forecasting crude oil futures contract prices. However, unlike many other studies, we focus on not retail but institutional investor attention due to their better-informed characteristics and superior information processing skills. In doing so, we employ the news trends function of the Bloomberg terminal and collect the news counts, which may carry information about oil prices and commodity market prices in general. We then construct an oil-based and a commodity-based institutional attention index (OIAI and CMIAI, respectively) from the news counts data and utilize them for predicting oil price futures returns while controlling for several macroeconomic variables such as economic activity and global crude oil production.

The empirical evidence shows that OIAI and CMIAI can significantly predict oil futures returns, even after controlling for supply and demand conditions and common macroeconomic predictors. Their prediction success is better for short-term maturity futures contracts than long-term ones. We also obtain the best forecasting performance when using both attention indices together. Moreover, including attention indices related to OPEC news is helpful only when forecasting longer horizons such as one year. In most cases, attention indices related to green energy markets do not improve forecasting performance. Finally, our analysis on the interaction between crude oil's implied volatility and institutional attention shows that the effect of investor attention on oil futures prices is regime-dependent. In particular, the significant predictive power of our institutional attention indices comes into play when the crude oil market is in the excess volatility phase.

Our study contributes to the related literature by (i) constructing a new and direct measure of institutional investor attention using Bloomberg terminal's news search function, thus complementing the investor attention literature that only focuses on retail attention measured by Google search volume to predict oil prices and (ii) capturing the multiple dimensions of investor attention by using news counts on topics such as carbon & environmental markets and OPEC announcements, thus identifying which news content is more predictive power for oil future returns.

a Department of Economics, Copenhagen Business School, Denmark.

b Corresponding author: IPAG Business School, Paris, France; International School, Vietnam National University, Hanoi, Vietnam; E-mail: d.nguyen@ipag.fr

c Faculty of Business Administration, Bilkent University, Turkey.

Variance Risk Premium in Energy Markets: Ex-Ante and Ex-Post Perspectives

Giacomo Morelli^a

The financialization of commodity markets has drawn the attention of risk managers and policy-makers on the assessment of the commodity risk arising from commodity prices fluctuations. Energy markets have revealed to be strongly connected to financial markets and to investor sentiment, which has a relevant role in the prediction of volatility. A relevant question concerns the prediction of the risk aversion of investors towards the risk generated by the variability in commodity price fluctuations, the commodity variance risk. In this study, we introduce notion of the ex-ante variance risk premium and apply it to forecast the energy markets, capturing the expected degree of distress as measured by the predicted propensity of market participants to hedge energy variance risk.

We use daily stock prices that span the period from October 2011 to February 2022 and focus on two energy indices, the Energy Select Sector SPDR Fund (XLE) and the United States Oil Fund (USO), and compare the results to the benchmark of the equity market, the SPX. To accomplish our goal, the methodology proposed relies on GARCH-type models to provide the forecasts of the realized variance whereas we retrieve the variance swap rates through the volatility indices VXXLE, OVX, and VIX of the corresponding market indices.

We account for the typical stylized facts of asset returns such as conditional heteroskedasticity, regime-switching, skewness, and kurtosis estimating the ex-ante variance risk premium from GARCH and Markov-switching GARCH (MS-GARCH) models with different distributions for the innovations (Gaussian, Student's-t, Skewed Gaussian, Skewed Student's-t). The MS-GARCH specification allows us to appraise the structural differences within energy and equity markets, especially through the computation of filtered and smoothed probabilities.

Our main result is that the ex-ante variance risk premium succeeds to anticipate the spikes of the ex-post variance risk premium which naturally arise during periods of increasing uncertainty in the market. In particular, the magnitude of the ex-ante variance risk premium highlights that investors require a higher premium to bear the expected oil variance risk relative to energy variance risk. We believe this is principally related to the increased diversification in the energy market, proxied by XLE, which also invests in other energy sectors.

Important policy implications can be gathered from this study. First, the ex-ante variance risk premium may be employed to carry out extended risk mapping. Second, it may be used to gauge the effects of hypothetical measures for policy designs. Third, preannouncing the outbreak of a crisis, the ex-ante variance risk premium captures the market scenarios that necessitate careful attention for pricing the related financial instruments and for the management of reserving risk.

^a Department of Statistical Sciences, Sapienza University of Rome, 00185 Rome, Italy. E-mail:giacomo.morelli@uniroma1.it.

Cryptocurrency Bubble on the Systemic Risk in Global Energy Companies

Qiang Ji,^a Ronald D. Ripple,^b Dayong Zhang,^c and Yuqian Zhao^d

Financialization has brought new challenges to the international energy markets, making energy systemic risk a more complicated issue. One of the important features is the development of cryptocurrency, which has become a critical part of the global financial markets. The linkages between the energy sector and financial markets and other commodities are not new in the literature, but the appearance of cryptocurrency in the spillover network has clear innovative features. In this paper, we find that cryptocurrency bubbles form and burst can have nonnegligible impacts on the systemic risks in the international energy sector.

To explore this issue, we extend the framework proposed by Brunnermeier et al. (2020), who establish an empirical strategy to test the role of asset bubbles on systemic risks in the banking sector. In particular, we first identify bubble dynamics in cryptocurrency prices and then use this information to test to what extent systemic risks in the energy sector respond to these bubbles. Our dataset includes the prices of a sample of the Thomson Reuters top 100 international energy companies, the cryptocurrency index (CRIX) and other related financial variables from July 2014 to March 2021. The systemic risks among energy firms are measured by the conditional value at risk and relative to their local market indices. We use the CRIX index to represent the overall performance of the cryptocurrency market. Then the Backward Supremum Augmented Dickey Fuller test is used to identify bubble dynamics in the cryptocurrency index. The connectedness between systemic risks and cryptocurrency bubbles is then investigated via panel data models.

Our empirical results show that the formation of cryptocurrency bubbles, especially when the bubbles burst, significantly increases systemic risks in the energy sector. This effect retains the same in the recent COVID-19 pandemic period. In addition, oil and gas companies play an essential channel in the risk spillover from cryptocurrency markets to the international energy markets. A number of robustness checks verify our main findings.

Our findings can also lead to a number of policy implications relevant to managers and regulators. For the executives of main energy firms, they should pay attention to the fluctuation of cryptocurrency prices, especially when observing pricing bubbles in the markets. Meanwhile, the bubbles in cryptocurrencies can induce higher systemic risks in the whole energy sector, leading to stronger needs to hedge against such risks. Existing literature on “safe-haven assets” suggests that cryptocurrency may act as a safe-haven asset, but the findings here show that extra caution should be taken when forming hedging strategies using cryptocurrency, as the frequent bubbles can cause higher risks. Regulators may not be able to control cryptocurrencies directly, but they should take cryptocurrency bubbles as a signal for increasing systemic risks in stock market, or specifically, energy sector and respond to such shocks accordingly.

a Institutes of Science and Development, Chinese Academy of Sciences, Beijing, China.

b Corresponding author. Associates, Sequim, Washington, USA. E-mail: ronaldripple@gmail.com.

c Research Institute of Economics and Management, Southwestern University of Finance and Economics, Chengdu, China.

d Kent Business School, University of Kent, Canterbury, UK.

Oil Price Shocks and Bank Risk around the World

Yi Jin,^a Pengxiang Zhai,^b and Zhaobo Zhu^c

Banks play an important role in economic activities around the world. Existing literature has documented many determinants of bank risk, such as banks' specific characteristics and macro-economic variables. Moreover, firms in oil-related industries have substantial bank loans. However, no study has not explicitly examined the effect of oil price shocks on bank risk.

We examine the impact of oil price shocks on bank risk based on 2,217 banks from 39 countries during the period of 2006 to 2017. Bank risk is measured by Z_SCORE . We use the structural VAR approach to get three specific oil price shocks (i.e., oil supply shocks, aggregate demand shock, and oil specific demand shocks). Besides the direct impact of oil shocks on bank risk, we are interested in whether policy interest rate as a mediation could explain the relation between oil shocks and bank risk. Because oil price shocks have different impact on financial markets and economy in different areas and economic conditions, we further examine the impact of oil shocks on bank risk in oil-importing versus oil-exporting countries and in normal time versus bad time.

Our main results are summarized as following: first, all three oil shocks have positive impacts on bank risk, but the impacts are different. Second, interest rate spread can act as an indirect channel or mediation effect to explain the oil-bank risk relationship for oil-exporting countries. Third, the mediation effect is not significant for both oil-importing and exporting countries during the financial crisis.

Our study enriches the banking literature that exclusively concentrates on financial markets and formal institutions. Specifically, our results shed light on the nexus of oil and bank risk, providing practical implications for policy makers. It is better for monetary authorities to mainly adopt macro-prudential monetary policy to maintain financial stability and enhance the public trust of monetary authorities. Future research could, in a unified framework, dig deeper into the nexus of oil price and financial institutions within a specific country or around the world.

Network Topology of Dynamic Credit Default Swap Curves of Energy Firms and the Role of Oil Shocks

Elie Bouri^d and Syed Jawad Hussain Shahzad^e

Evidence on the credit risk of energy firms is mainly obtained from conventional market-based frameworks involving stock returns, and the few studies that consider credit risk data use the level of credit default swap (CDS) spreads only, i.e. the CDS spreads of one single maturity,

a School of Finance, Tianjin University of Finance and Economics, Tianjin 300222, China.

b School of Economics and Management, Beihang University, Beijing 100191, China.

c Corresponding author: Shenzhen Audencia Business School, WeBank Institute of Fintech, Shenzhen University. Email: zb.zhu@szu.edu.cn

d School of Business, Lebanese American University, Lebanon.

e Corresponding author: Montpellier Business School, 2300 Av. des Moulins, 34080 Montpellier, France. E-mail: j.syed@montpellier-bs.com

such as the 5-year. However, the level of CDS spreads may be insufficient to understand the complex and multi-layered dynamics and interconnectedness of credit risk across energy firms, which necessitates the inclusion of the slope and curvature of CDS spreads in the analysis. In this paper, we examine the joint dependency of the level, slope, and curvature factors of the CDS curves of energy firms to make inferences regarding the interconnectedness of their long-, short-, and medium-term default risk. Using daily data on CDS curves of 21 US and European energy firms from July 18, 2008 to March 19, 2021 and the generalized variance decomposition approach augmented by a network typology, the results show heterogeneity and time evolution in the level of interconnectedness of default risk across various credit horizons and between US and European firms.

Notably, the interconnectedness of default risk across some credit horizons tends to increase during major crisis periods such as the oil price crash of 2014-2015 and the COVID19 outbreak, indicating credit deterioration and vulnerability of the energy system to a possible clustered default during various crisis periods. Further analysis shows evidence that oil demand shocks and oil supply shocks have an impact on interconnectedness, although the impact is not homogenous across the three default factors. The findings are useful for both international investors and policymakers who continuously seek to better understand the connectedness of default factors and refine the means of monitoring the systemic vulnerability of US and European energy firms.