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EDUCATION

PhD in Finance
University of Oklahoma
Aug 2018 – present (GPA: 4.0, Expected Defense by May 2023)

Research Master in Business and Management – Finance
Erasmus University Rotterdam, The Netherlands
Sep 2016 - Jul 2018 (GPA: 4.0)

Master of Science in Finance
University of Delaware
Aug 2013 - Dec 2014 (GPA: 3.8)

Bachelor of Economics in (Mathematical) Finance (Dual Degree)
Xiamen University, China
Sep 2011- Jul 2013

Bachelor of Science in Chemistry
Xiamen University, China
Sep 2009 - Jul 2013

RESEARCH AREAS

Investments, Energy Finance, Derivatives, ESG

PUBLICATION

1. ***The Relation Between Petroleum Product Prices and Crude Oil Prices*** (with Louis H. Ederington, Chitru S. Fernando, Thomas K. Lee, and Scott C. Linn), February 2021, *Energy Economics*, 94, 105079.
Journal link
Abstract: "We present an empirical examination of the relation between real spot Brent oil prices and real spot petroleum product prices, specifically gasoline and heating oil prices. Based upon weekly price data spanning a 30-year period ending in April 2019, we provide consistent evidence of Granger causality running from oil

prices to product prices accounting for both non-stationarity of the series, and separately conditional heteroskedasticity. No evidence of Granger causality from product prices to oil prices is found for the full sample period nor the period up to the end of 2005, but evidence that gasoline prices Granger-caused oil prices is found for post-2005. Similar results are found for an extended model that also includes potentially endogenous real market variables related to supply and demand in the oil, heating oil and gasoline markets. Given the reduced form model results that oil prices Granger-cause gasoline and heating oil prices, we specify and estimate recursively identified structural vector autoregressive models that specifically account for structural supply and demand shocks in the oil market as well as the petroleum product markets. The oil market block follows Kilian (2009). We find that real spot gasoline prices and real heating oil prices do not respond to structural oil supply shocks, respond transiently to global commodity demand shocks, but do respond to oil-specific demand shocks. We conclude the result that spot oil prices Granger-cause spot gasoline and heating oil prices largely occurs through the channel of oil-specific demand shocks."

JOB MARKET PAPER

Skewness and Kurtosis, Real Options, and Investment Under Uncertainty (sole-authored)

Abstract: "This study examines how the probability of exercising a real option is influenced by the skewness and kurtosis, in addition to volatility, of output price changes in the presence of sunk costs and irreversible investments. The underlying motivation is a modified Real Option Valuation model that accounts for skewness and kurtosis when the underlying price change distribution is not Normal. Oil price changes exhibit both volatility, non-Normal skewness and kurtosis. I therefore study several real choices made by oil well operators. Using a large sample of oil wells (53 million well-month observations) from five oil producing U.S. states, I examine the drilling, production and shut down decisions associated with each well during the period 2010-2019. Results based upon the estimation of panel choice models and Cox Proportional Hazard models, show that the decisions made are influenced by both skewness, kurtosis, volatility and expected prices as value maximizing theory in the presence of price uncertainty and sunk costs predict. The results are not consistent with a prediction that the personal preferences of the decision makers (aside from value maximization) influence the choices studied. The results are robust to a number of alternative tests and specifications. A one standard deviation increase in skewness is associated with a 1.83% change in the probability to re-open a mothballed well (and 18.93% to close a well); a similar increase in kurtosis leads to a 5.87% change in the likelihood of resuming production (and 13.78% to drill a new well)."

WORKING PAPERS

1. Forecaster Herding, Timing and Accuracy in the Age of ESG (with Louis H. Ederington and Scott C. Linn)

Abstract: "Using a panel of 19,677 forecasts of the change in natural gas in storage in the U.S. for the period 2003-2021 we find that as the focus on Environmental, Social and Governance (ESG) increased forecast accuracy in this highly "E" sensitive sector improved, and, while forecasters predominantly anti-herd (rely on private information) anti-herding intensity declined. The greater anti-herding intensity and the early release of forecasts are associated with larger forecast errors, together largely determine accuracy, and the relation is unaffected by the shift in ESG focus. The results suggest that the ESG focus had the complimentary effect of increasing attention on fundamentals. The most accurate forecasters tend to neither herd nor anti-herd, and the less accurate forecasters anti-herd. Forecasts issued early are less accurate and more dispersed. The consensus of the less accurate forecasts is found to be unbiased at a conservative confidence level both before the focus on ESG intensified as well as after. The results are robust to numerous additional test specifications. "

Presentations: *FMA Annual Meeting 2022 (regular program), University of Edinburgh 2022 (presented by a co-author), University of Missouri 2020 (presented by a co-author)*

2. News Tones, Information Arrivals, and Sentiments in Commodities: In the Context of Crude Oil (sole-authored)

Abstract: "I explore the effect of oil shock news tone on oil futures returns and analyze sentiment's role in the observed price responses. I show that news tone significantly impacts commodity futures returns. Disagreement in "oil shocks" news tones leads to significant adverse oil futures price movements during the 30 minutes following news releases. Using the Gunning-Fog Index to measure text complexity, I find that complexity reduces the magnitude of this adverse effect of Disagreement on oil futures returns. I document a similar result when the news report contains more numerical data. However, I find the Disagreement (in news tone) impact is only significant when there is more uncertainty in the market and the news comes from institutional newswires. I find that the evidence suggests investors overreact to negative news, but price declines are partially reversed on subsequent dates while the price effects of positive news are persistent. News tones associated with demand- and supply-side news have asymmetric effects on oil futures. Demand-side news causes faster and larger effects compared to supply-side news. A simple trading strategy on news tones generates significant and positive returns."

Presentations: *University of Oklahoma Brownbag Seminar (2020)*

WORK IN PROGRESS

1. Commodity Pricing Bubbles (with Scott C. Linn and Ping Zhang)

We use the Jarrow and Kwok (2020) non-parametric bubble estimator to obtain estimates of commodity pricing bubbles. We find evidence of price bubbles for study a variety of major commodities including metals (gold, copper, and silver), energy (oil, gasoline, and heating oil), and agricultural (wheat, soybean, and corn). Exploration of the determinants of the price bubbles we document is under development.

2. Oil Sentiment and M&A (sole-authored)

This study explores whether investor sentiment during pre-merger negotiation window and sentiment during negotiation window influence the outcomes of M&A deals. Previous studies on the influence of sentiment on M&A deal negotiations do not consider the importance of the point in time when the initiator of the deal puts forward the deal proposals. Most existing studies only explore the information asymmetry between the firms involved in the M&A deals and shareholders. This study will explore if the information asymmetry between the acquirers and the targets matter to the value and outcomes of M&A deals with the data from Bloomberg for the "proposal dates". I examine whether the proportion of the split in the value change between the acquirer and the target depends on investor sentiment during the pre-negotiation window and the negotiation window oil sentiment. I focus on oil company merger offers that occurred during the period 1985-2022. Data on investor sentiment have been gathered and prepared as well as the sample of mergers.

3. Commodity Option Implied Moments (sole-authored)

This study focuses on the connection between commodity and equity markets by examining the risk-neutral implied moments of commodity and equity market prices commonality. The intense increased focus on climate change, physical climate risk and climate policy uncertainty has created potentially important implications for many commodities and the pricing and risk of those commodities, in particular energy-related commodities. Likewise firms with exposures to those commodities are potentially impacted as well. These impacts should manifest themselves in the future expected price densities of these assets, specifically in implied volatility, skewness and kurtosis. Gaining a deeper understanding on the connections and the market's beliefs about future risk can both guide corporate as well as public policy makers in their decision making.

CONFERENCES

In-Person Participation:

FMA Annual Meeting 2022 (paper accepted for program) , Energy and Climate Finance Research Conference 2022, FMA Annual Meeting 2019, Energy and Commodities Finance Research Conference 2019, Southwest Finance Symposium 2019

Virtual Program Participation:

Southwest Finance Symposium 2022 and 2021, ASSA Annual Meeting 2022, European Finance Association Annual Conference 2021, Energy and the Economy: Navigating the Changing Energy Landscape Conference 2020, Wharton Climate and Commodities Virtual Conference 2020, FMA Annual Meeting 2020

TEACHING EXPERIENCE

Independent Instructor:

Business Finance (FIN 2303), in-person, Fall 2022

Investments (FIN 3503), in-person Spring 2022

Investments (FIN 3503), in-person and online, Spring 2021

Teaching Assistant:

Investments (FIN 3503), in-person, Fall 2018

HONORS AND AWARDS

University of Oklahoma Doctoral Scholarship (2018-2023)

Erasmus Research Institute of Management Scholarship (2016)

Xiamen University Business Scholarship (2013)

Xiamen University Excellent Student Scholarship (2010, 2011 and 2012)

PROGRAMMING SKILLS

Proficient in **Stata** programming

SAS (SAS Certified Base Programmer for SAS 9, 92%)

Skilled in **Matlab**, **Python**, **R**, and **Eviews**

Performed programming and computational tasks on supercomputers via **high performance computing system**

REFERENCES

Dr. Scott C. Linn (Chair)
Professor Emeritus of Finance
University of Oklahoma
(405) 595-7426
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Dr. Chitru S. Fernando
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