Research Statement

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I am a job market candidate in Economics at Duke University. My fields of interest are financial economics and applied econometrics. My research concentrates on applying econometric tools to solve problems in finance, based on high frequency data. In particular, my dissertation topic is market microstructure and information processing in financial markets.

The joint paper with Tim Bollerslev and Jia Li, “Volume, Volatility and Public News Announcements” studies the relationship between trading activity and price volatility around macroeconomic announcements. We derive the volume-volatility elasticity from a model in which investors agree to disagree and show the elasticity decreases with investors’ disagreement on the common public signal. The estimates of elasticities are based on high frequency econometric tools, including nonparametric estimation of volume intensity and spot volatility as well as identification by discontinuity. Besides, difference-in-difference method is applied to control for intraday seasonality of volume and volatility. We use dispersion on real economy activity, economic uncertainty measures constructed from text to proxy for investor disagreement. Consistent with the model predictions, for both the S&P 500 ETF and the ten-year treasury bond futures, estimated elasticities significantly decrease with disagreement measures.

In these differences-of-opinion models, investors interpret the common signals differently with a certain confidence level, and this process is subject to investor sentiment. This motivation leads to my job market paper “Investor Sentiment and Volume-Volatility Relationship”. I divide the full sample into high and low sentiment periods, and find that disagreement measures only significantly decrease the volume volatility elasticity of the S&P 500 ETF in high sentiment periods. This result is in line with the behavioral finance literature that people possess high confidence during high sentiment periods. To see whether the same conclusion holds for individual stocks, I incorporate a one factor model with heterogeneous beliefs in the differences-of-opinion model and explicitly solve the elasticity as a function of total disagreement, which can be decomposed into disagreement on the public signal and the idiosyncratic term. A panel regression with DID is implemented on the intraday transaction data of the Dow Jones 30 components to estimate the elasticities in both high and low sentiment periods. The result is consistent with the model predictions: disagreement measures significantly decrease elasticity only in high sentiment periods, and the idiosyncratic ratio decreases elasticity in both periods. This paper contributes to the behavioral finance literature in that it shows sentiment can affect information processing.

I am currently working on a project on efficient estimator of functionals of stock variances. Many of the most frequently used estimators of stock variances are not even consistent if the sampling times are irregular and volatility are time varying, and they will introduce biases for less liquid stocks. I propose an efficient estimator for the smooth functional of variance, under an irregular and random, but independent sampling. I prove the consistency and efficiency of the new estimator, and conduct simulations to verify the derived asymptotic distribution.

With these high frequency econometrics tools and data there is yet much to explore. One potential extension of my current dissertation is to investigate the quote data to better understand the trading behavior around public announcements. Besides, I am also interested in firm-specific information release. I believe that combining high frequency data and tools with natural language processing on firm-specific news can shed light on intraday information processing for individual stocks.