Research Statement

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My research field concentrates on the Financial Economics, Financial Econometrics, Empirical Finance and Asset Pricing. I am particularly interested in methods developed in the empirical financial literatures to investigate the risk of spill-over effects and the identification of systemically important financial institutions. My job market paper develops a common framework based on a copula model to estimate several popular return-based systemic risk measures: Delta Conditional Value at Risk ($\Delta CoVaR$) and its modification ($\Delta CoVaR^{\leq}$); and Marginal Expected Shortfall ($MES$) and its extension, systemic risk measure ($SRISK$). By eliminating the discrepancy of the marginal distribution, I concentrate only on the effects of dependence structure in the estimation of systemic risk measure. The empirical studies for a large number of financial institutions deliver the followings interesting results. First, we found that the linear quantile regression estimation of $\Delta CoVaR$, proposed by Adrian and Brunnermeier (AB hereafter) (2011), is inadequate to completely capture the non-linear contagion tail effect, which tends to underestimate systemic risk in the presence of lower tail dependence. Second, $\Delta CoVaR$ originally proposed by AB (2011) is in conflict with dependence measures. By comparison, the modified version of $\Delta CoVaR^{\leq}$ put forward by Girardi et al. (2011) and $MES$, proposed by Acharya et al. (2010), are more consistent with dependence measures, which conforms with the widely held notion that stronger dependence strength results in higher systemic risk. Third, $\Delta CoVaR^{\leq}$ is observed to have a strong correlation with tail dependence. In contrast, $MES$ is found to have a strong empirical relationship with firms’ conditional CAPM $\beta$. $SRISK$, however, provides further connection with firms’ level characteristics by accounting for information on market capitalization and liability. This stylized fact seems to imply that $\Delta CoVaR^{\leq}$ is more in line with the “too interconnected to fail” paradigm, while $SRISK$ is more related to the “too big to fail” paradigm. In contrast, $MES$ offers a compromise between these two paradigms.

My research also focus on the application of quantile regression in Financial Economics, especially related to the stock return prediction and cross sectional stock return estimation. My second paper propose a novel quantile-based approach to estimate the conditional beta risk more efficiently without assuming a parametric structure on distribution. Multiple quantiles estimates are combined in weighting schemes to utilize information across the whole distribution. Monte Carlo simulation demonstrates significant efficiency improvement for beta estimation from our proposed approach when tail of distribution is thicker than normal distribution. Applying our quantile-based method in the financial market to estimate firm specific beta risk in our sample data, a pronounced difference was found between OLS and quantile combination estimator. Our robust approach also applied to Fama MacBeth Capital Asset Pricing Test. The goodness of fit for the Fama MacBeth second pass cross sectional regression increase slightly as we use quantile combination approach
instead of OLS to estimate beta risk, which implies a lower measurement error of beta leading to the improvement in the second pass cross section regression. Finally, we studied the robust measurement of factor risk Premium and found that the size factor effect disappear after introducing our robust approach to estimate risk premium.

My third paper studied the predictive gains from both model combination and quantile combination. Model combination pool the information on the same part of distribution from different models, but ignore the distributional information within the model. Quantile regression, however, is capable of estimating the whole distribution of time series. This paper proposes a novel approach to utilize the distributional information from the quantile regression models. Different schemes of combinations are studied. Two stages combination are developed to take advantage of the information both across and within the Models. It turns out that two stage combination utilizing information both across and within models can produce more accurate prediction.

As can be seen from my work, I am interested in the applied econometrics in financial economics. More broadly, I am also interested in working on other topic related to Asset Pricing and Empirical Finance. During my years at Boston College, I had received a solid and invaluable quantitative and qualitative training in the Econometrics and Asset pricing theory.