

# YANG LIU

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## EDUCATION

**Department of Economics, Rutgers University**, New Brunswick, NJ May 2024 (Expected)  
**Ph.D. in Econometrics and Quantitative Economics**

**Robert H. Smith School of Business, University of Maryland**, College Park, MD May 2018  
**Master of Quantitative Finance: Asset Management and Risk Management**

**Capital University of Economics and Business (CUEB)**, Beijing, China June 2016  
**Bachelor of Management, Major: International Human Resources Management**

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## FIELDS OF INTEREST

- **Applied Econometrics, Forecasting, Machine Learning, Financial Econometrics, Empirical Asset Pricing**
- **Concentration: high-dimensional data, time series data, real-time data, factor models, variable selection**

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## RESEARCH EXPERIENCE

**An Assessment of the Marginal Predictive Content of Economic Uncertainty Indexes and Business Conditions Predictors (R&R at *International Journal of Forecasting*)**

- (with Norman R. Swanson)

■ *Abstract:* In this paper, we evaluate the marginal predictive content of a variety of new business conditions (BC) predictors as well as nine economic uncertainty indexes (EUIs) constructed using these predictors. Our predictors are defined as observable variables and latent factors extracted from a high dimensional macroeconomic dataset and our EUIs are functions of predictive errors from models that incorporate these predictors. Estimation of the predictors is based on a number of extant and novel machine learning methods that combine dimension reduction, variable selection, and shrinkage. When predicting 14 monthly U.S. economic series selected from 8 different groups of economic variables, our new indexes and predictors are shown to result in significant improvements in forecast accuracy, relative to predictions made using benchmark models. Moreover, while inclusion of either BC predictors or EUIs often yields forecast accuracy improvements, greater predictive gains accrue when using BC predictors with real economic activity type variables. And adding both BC predictors and EUIs together are especially useful for the forecasting of housing market variables in the short-term horizon.

**Selecting the Relevant Variables for Factor Estimation in FAVAR Models (Working Paper)**

- (with John C. Chao and Norman R. Swanson)

■ *Abstract:* When specifying and estimating latent factor models, a common assumption made is one of factor pervasiveness, which requires that  $\Gamma'\Gamma/N$  converges to a positive definite matrix, as  $N \rightarrow \infty$ , where  $\Gamma$  denotes the loading matrix of the factor model. This paper builds on the recent nascent literature that examines how to relax this assumption (see e.g., Giglio, Xiu, and Zhang (2021), Freyaldenhoven (2022a, b), and Bai and Ng (2023)) and analyzes the scenario where there is significant underlying heterogeneity in the sense that some of the variables load significantly on the underlying factors, while others are irrelevant. Consistent factor estimation turns out to be feasible, even under factor nonpervasiveness, if one first prescreens all available variables and prunes out the irrelevant ones. For this purpose, we introduce, within a factor-augmented VAR framework, a novel variable selection procedure that, with probability approaching one, correctly distinguishes between relevant and irrelevant variables. Our methodology enables the consistent estimation of conditional mean functions of factor-augmented forecast equations, even when the conventional assumption of factor pervasiveness is violated.

## **Spillover Effect for Nine Sector ETFs in Bad News and Good News Conditions (Working Paper)**

■ *Abstract:* Macroeconomic news announcement can give some influences to financial market. In this paper, we use VAR model to examine the spillover effect of three liquidity measurements, which are quoted spread, effective spread and market depth, for nine sector ETFs under bad news and good news conditions in Covid-19 pandemic period. We collect high-frequency data from TAQ database. And we use the absolute value of significant coefficients (at 5% significant level) as the magnitude measurement of spillover effects for nine sector ETFs. We find that there are stronger and clearer spillover effects for quoted spread and some spillover effects for market depth. But there is no clear and strong spillover effect for effective spread. And in general, the spillover effect in bad news condition is larger and stronger than that in good news condition for all of these three liquidity measurements.

## **Can Stock Characteristics Lead the Forecasting for High-frequency Volatilities? (Work in Progress)**

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### **WORK EXPERIENCE**

#### **Internship (BNY Mellon)**

- **Data Modeler, Economic Forecasting Group, BNY Mellon, New York City, NY** June 2022—Oct. 2022

- Re-estimate different models using updated new data for several financial assets or macroeconomic variables (such as ABS spreads variables, covered bonds and VIX) in order to find new drivers to improve their forecasting performances.
- Conducted CCAR stress tests for multiple macroeconomic variables in various aspects and recorded each of them in a complete document for model validation team.
- For each model: examined the coefficient stability, fitted in crisis era with calibration sample, conducted out-of-sample forecasting, plotted model fit condition in graph and conducted residual tests.
- Make a presentation for model development progresses in the weekly team meeting and explained different models in economic concepts.
- Prepare slides for financial market news update and macroeconomic overview in the quarterly company conference.

#### **Research Assistant, Rutgers University, New Brunswick, NJ**

- **Developing A New R Package “LavaCvxr”**

March 2021—June 2021

- Developed and published “LavaCvxr” package in R using CVXR for Lava method, which is introduced in Chernozhukov et al. (2017).
- Paper for Lava method: Chernozhukov, V., Hansen, C., & Liao, Y. (2017). A lava attack on the recovery of sums of dense and sparse signals. *Annals of Statistics*, 45(1), 39-76.

#### **Research Assistant, University of Maryland, College Park, MD**

- **Analyzed transaction data for ESM10 and SPY in flash crash, May 6, 2010**

Sep. 2017—Dec. 2017

- Run linear regression using R between log returns of ESM10 and SPY for three time periods (before/ during/ after flash crash) to analyze the arbitrage relationship and changes of average trade size for every minute.
- Analyzed bid-ask spread and market depth of SPY to see the changes of market liquidity. Used bar plots to analyze percentage changes of even tick and odds tick for SPY and ESM10 to see differences across data sets.

#### **- Manufacturing Sector**

Oct. 2016—Dec. 2016

- Constructed linear regression with fixed effect using SAS to predict revenue growth for hundreds of companies within manufacturing sector to see the influences from firm level variables and macroeconomic variables.
- Did winsorization for outliers, used stepwise method and VIF results to select final regressors in model.
- Did two sample T test to compare the results between public companies and private companies; checked heteroscedasticity.

## **- Consumer Nondurables Sector and S&P 500 Index**

Oct. 2016—Dec. 2016

- Run linear regression **using MATLAB** to forecast return of consumer nondurables sector by using financial and macroeconomic variables.
- Used Dickey Fuller test to check data stationary; did backward discard and forward selection to do regressors selection.
- Durbin Watson test: check first-order-autocorrelation, White test: check heteroscedasticity, Jarque-Bera test: check normality.
- Forecast 1-step ahead variance for S&P 500 series by using GARCH(1,1) and GJR-GARCH(1,1,1) of 50 years daily data.

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## **TEACHING EXPERIENCE**

**Lecturer, Department of Economics, Rutgers University, New Brunswick, NJ** Summer 2021, 2022, 2023

- **Intermediate Microeconomics – Undergraduate course** (Summer 2021).
- **Econometrics – Undergraduate course** (Summer 2022).
- Prepared teaching notes, assignments, two exams and two review sessions for each of above two courses.
- Received the final overall evaluation as 4/5 for both of above two courses.
- **Introduction to R** (one-day workshop for the **first-year Ph.D. students** in Summer 2022 and Summer 2023).

**Teaching Assistant, Department of Economics, Rutgers University, New Brunswick, NJ** 2019—2023

- Econometrics II (Ph.D. students) Spring 2023
- Forecasting and Big Data Fall 2022
- Capital Markets Fall 2021, Spring 2022
- Advanced Statistics (Ph.D. students) Fall 2021
- Introduction to Microeconomics Spring 2021
- Economics of Taxation Fall 2020
- Introduction to Macroeconomics Fall 2019, Spring 2020

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## **CONFERENCES, WORKSHOPS AND PRESENTATIONS**

- Econometrics Seminar, Rutgers University Nov. 2023
- 2023 Annual Meeting of the International Society for Data Science and Analytics (ISDSA) July 2023
- 2023 The 37th Annual Conference of the Pennsylvania Economic Association (PEA) June 2023
- 2023 The Chinese Economists Society China Annual Conference (CES) June 2023
- The 18th CIREQ PhD Students Annual Conference at Concordia University (accepted) May 2023
- 2023 BREAD-IGC Virtual PhD Course Jan. 2023—Feb. 2023

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## **HONORS AND AWARDS**

- Alfred S. Eichner Economics Prize, Rutgers University Spring 2023
- Richard Lock Endowed Fund for Economics Award, Rutgers University Spring 2023
- Dorothy Rinaldi Fellowship, Rutgers University Spring 2023
- Conference Travel Award, Rutgers University Spring 2023
- MMI Market Structure Research Fellowship, Modern Market Initiative Spring 2022
- Teaching Assistantship, Rutgers University 2019-2022
- 2nd award in 2014 China Undergraduate Mathematical Contest in Modeling (CUMCM). 2014
- Scholarships for Academic Distinction, Capital University of Economics and Business 2012-2016

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## **SKILLS AND ADDITIONAL INFORMATION**

- **Passed CFA Level 1 Test**
- Programs: **R, MATLAB, Python, SQL, SAS**
- English (fluent), Mandarin (native)

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## REFERENCES

### **Norman R. Swanson (Chair)**

Distinguished Professor of Economics

Graduate Program Director

Department of Economics, Rutgers University

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### **John Chao**

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