

Kaiwen Qiu

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EDUCATION

Rutgers University, New Brunswick, NJ Ph.D. in Econometrics and Quantitative Economics	2021-Present
Princeton University, Princeton, NJ Exchange Ph.D. Student	2022
Georgetown University, Washington, DC Master of Science in Econometrics and Quantitative Economics (Computational Economics Track)	2021
University of Colorado Boulder, Boulder, CO Bachelor of Arts in Mathematical Economics	2019

FIELDS OF INTEREST

Applied Econometrics, Forecasting, Machine Learning, LLM-based Sentiment Analysis, Macroeconometrics, Time Series

RESEARCH

- Chao, J., Liu, Y., **Qiu, K.**, and Swanson, N.R.(2026). Consistent Factor Estimation and Forecasting in Factor-Augmented VAR Models, *Quantitative Economics*(R&R)
Abstract: In this paper we establish that conditional mean functions associated with h -step ahead forecasting equations implied by a factor augmented vector autoregressions (FAVARs) can be consistently estimated in the case where factor pervasiveness does not hold. In particular, we begin by stating a common assumption of factor pervasiveness in which all available predictor variables (excepting a negligible subset) load significantly on the underlying factors. We then establish that even when this assumption is relaxed, consistent factor estimation can be achieved if one pre-screens the variables and successfully prunes out the irrelevant ones. Furthermore, use of factors estimated in this manner when constructing h -step ahead forecasting equations implied by FAVAR models enables the consistent estimation of the conditional mean function of said equations, and conditional mean functions constructed used our procedure are consistently estimable in a wide range of situations, including cases where violation of factor pervasiveness is such that consistent estimation is precluded in the absence of variable pre-screening.
- **Qiu, K.**, Kabiri, A., Landon-Lane, J., and Swanson, N.R.(2026). New Evidence of the Usefulness of Real-Time Sentiment Indices in Econometric and Judgement Based Forecasting Models *Job Market Paper*
Abstract: In this paper we construct a set of new narrative sentiment indices using textual data from a large corpus of U.S. economic and policy documents. The indices are designed for use in real-time forecasting contexts, and are constructed using transformer-based language models and LLM-assisted annotation. They include: a finance-domain transformer; an economics-tone model trained on LLM-generated annotations of Federal Reserve, BLS, and Census text; and a topic-conditioned narrative measure. In order to determine the usefulness of these three indices for forecasting, we carry out a series of experiments in which their marginal predictive content is assessed. In particular, we first assess the predictive content of the indices in econometric models that are used for real-time U.S. macroeconomic and financial forecasting. We then assess whether our sentiment indices contain information that can be utilized to improve the (quasi) judgemental forecasts reported in the United States Survey of Professional Forecasters (SPF). This is done by testing the rationality of SPF forecasts when conditioning on both real-time macroeconomic variables and our sentiment indices. In the real-time forecasting experiment, the autoregressive benchmark attains the lowest mean square forecast error in 11 of 44 target variable / forecast horizon cases, while one of the eleven alternative models attains

the lowest mean square forecast error in the remaining 33 cases; among these 33 cases, 31 involve specifications containing at least one sentiment index and 2 involve the macroeconomic variable only specification. In addition, we find that SPF forecasts incorporate the information contained in our three contemporaneous economic narratives indices, but do not incorporate the information contained in two widely used consumer-sentiment survey indices. Thus, construction of real-time econometric forecasts can be made more accurate by incorporating the information from our new narrative indices, while judgemental forecasts can be made more accurate by utilizing information available in consumer sentiment indices, but not by utilizing information available in our new narrative sentiment indices.

- **Qiu, K.** (2026). Diffusion Indices, Policy Rules, and LLM Narratives: Forecasting the U.S. Yield Curve in Real Time *Working Paper*.

Abstract: Econometricians increasingly rely on machine-learning tools to summarize information in data-rich environments, yet the relative forecasting value of (i) macro-based diffusion indices, (ii) text-based (LLM) sentiment indices, and (iii) monetary-policy-rule information remains unclear within a unified term-structure framework. This paper conducts a horse race across these information sets by embedding them into a dynamic Nelson–Siegel class model, including its rotated short-rate-based representation (RDNS). We compare three families of real-time diffusion indices constructed from large macro panels: principal components (PCA), targeted shrinkage via LASSO/Elastic Net (EN), and the Chao–Swanson (CS) variable-selection approach. We further introduce three LLM-based text indices designed to capture policy-relevant narratives: an off-the-shelf FinBERT sentiment measure, an economics-domain trained BERT index, and a topic-fusion fine-tuned index that integrates topic structure with supervised sentiment signals. Finally, we incorporate monetary policy information through Taylor-rule components and Taylor-rule residuals (interpreted as policy shocks), motivated by the forward-looking policy-rule literature. Using a real-time rolling-window design, we forecast yields across maturities and horizons. Our results show that (i) CS-based diffusion indices extract more forecasting-relevant macro information than conventional LASSO/EN targeted-PCA constructions, (ii) LLM-based indices contain incremental predictive content beyond macro diffusion indices, particularly around policy-relevant episodes, and (iii) adding Taylor-rule components and/or policy shocks improves short- and intermediate-horizon yield forecasts, with the largest gains concentrated at the short end of the curve. Overall, combining policy-rule information with data-rich indices delivers the most reliable improvements in predictive accuracy for the U.S. Treasury yield curve.

- Long, L., Zhang, C., Ma, C., Wang, H., Ji, L., Gao, F., Zhang, J., **Qiu, K.** (2025). Algorithmic Trading by Reinforcement Learning in A Collaborative Manner (Journal Submitted).

Abstract: The application of reinforcement learning approaches in algorithmic trading has been studied widely in recent years. The majority of research concentrates on processing time series and refining neural network architectures, particularly within the framework of single-agent approaches. Some studies have demonstrated that employing multi-agent or ensemble learning can enhance performance. However, the prevalent practice of utilizing ensemble neural networks or various reinforcement learning methods to train simultaneously on the entire time series results in increased computational costs and inefficient recognition of market fluctuations. In this paper, we address these challenges by dividing the lengthy time series data into shorter segments, and introducing a collaborative training framework akin to distributed learning to train multiple clients on these segments. A self-imitation method is integrated to improve collaboration among these clients. Additionally, we propose a multi-loss function that combines the strengths of reinforcement learning with those of imitation learning. Building on this foundation, a Collaborative Self-Imitation Double Deep Q Network (CSI-DDQN) is proposed to train these clients effectively. Our experimental results, conducted using a multi-layer perceptron (MLP) architecture on U.S. stock data, demonstrate that our proposed method significantly outperforms traditional baseline models, particularly excelling in the performance metric of Sharpe ratio (SR). This highlights its effectiveness in maximizing returns and mitigating risks. Furthermore, to demonstrate the flexibility and adaptability of the newly proposed framework to different market conditions, more experiments were conducted by replacing the corresponding parts in the current framework with other compute plans, network

WORK EXPERIENCE

Quantitative Researcher Internship, PGIM, Newark, NJ

June 2025 - August 2025

- Developed FX timing alpha using nonlinear variable selection and Random Forest, back test with L/S strategies.
- Leveraged SHAP values for feature attribution, enabling transparent risk budgeting.

- Implemented transfer-entropy signals using information-flow modeling linking daily Economic Surprise Index shocks to intraday FX moves.

Research Assistant, Rutgers University, New Brunswick, NJ

May 2024 - May 2025

- Developing a new R package “DrdidGmm” with doubly robust estimator using GMM estimation, which is introduced in Xu(2024). “DrdidGmm” is used to compute the doubly robust DID estimators for the ATT and spillover effect in difference-in-differences (DiD) setups with empirical data, allowing the options of standard errors including heteroskedasticity-robust standard error, cluster-robust standard error, and spatial-robust standard error.

Research Assistant, Rutgers University, New Brunswick, NJ

March 2024 - May 2024

- Collected intraday observations on 380 constituents of the S&P 500 index and the SPDR S&P 500 ETF (SPY) from the TAQ database.
- Apply Chao-Swanson variable selection and other shrinkage methods to select stocks and other features including estimated factors and all sets of tuning parameters based on the training practice with machine learning techniques and forecasting-based data driven cross-validation processes.

Research Assistant, Rutgers University, New Brunswick, NJ

March 2023 - Dec. 2023

- Constructed real-time data(first released data) for more than 130 macroeconomic and financial variables based on FRED dataset.
- Constructed the Emotion measure using subsets of words from the Reuters Historical News Archive, and comparing with the relative shift sentiment (RSS) lexicon. Combined the measure of Emotion with judgmental as well as econometric model-based forecasts to their marginal predictive content for predicting a number of key economic time series variables.

IT Summer Associate, Thermo Fisher Scientific, Shanghai, China,

June 2019 - Aug. 2019

- Participated in writing order automation project with Automagica (open source RPA), which uses Robotic Process Automation technologies based on Python for cross-platform processes. Familiar with the different features of Automagica including its visual flow designer, and Automagica Bot.

Summer Risk Analyst, China Pacific Insurance, Shanghai, China

June 2018 - Aug. 2018

- Familiar with the attributions of critical illness packages. Sorted out the insurance policy and recorded it into the database of the company. And participated in the data analysis of critical illness insurance for urban residents, and the construction and validation of risk models.

TEACHING EXPERIENCE

Instructor, Rutgers University

2024

- Econ 322: Econometrics 2024 Summer, Course Evaluation: 4.71
- R Workshop 2024 Summer, 2025 Summer, 2026 Summer

Teaching Assistant, Rutgers University

2022-2025

- Econ for Big Data(Master Level) Spring 2025
- Advanced Time Series Spring 2025
- Econometrics II(PhD Level) Fall 2024
- Econometrics Fall 2023, Spring 2024, Fall 2024
- Econometrics I(PhD Level) Spring 2024
- Introduction to Macroeconomics Spring 2023
- Money, Banking and the Financial System Spring 2023
- Intermediate Macroeconomic Analysis Fall 2022

Economic Tutor(for undergrads), University of Colorado Boulder

Spring 2018

REFeree

- *Journal of Time Series Analysis*(2), *International Journal of Forecasting*(3), *Journal of Financial Econometrics*(1)

CONFERENCES

- **Midwest Economics Association(MEA)** April 2026
Presented: "Diffusion Indices, Policy Rules, and LLM Narratives: Forecasting the U.S. Yield Curve in Real Time"
- **International Association for Applied Econometrics (IAAE) Xiamen** June 2024
Presented: "Consistent Factor Estimation and Forecasting in Factor-Augmented VAR Models, with an Application to Forecasting Stock Returns"

HONORS AND AWARDS

- Graduate Assistantship, Rutgers University 2025-2026
- Prof. Hiroki Tsurumi and Peter J. Zangari Graduate Dissertation Award, Rutgers University Spring 2025
- Peter Asch Memorial Scholarship, Rutgers University Spring 2025
- Sidney I. Simon Teaching Award, Rutgers University Spring 2025
- Honorable mention in Sidney I. Simon Prize, Rutgers University Spring 2024
- Sidney Grant, Rutgers University Spring 2024
- Sidney Brown Prize in Economics, Rutgers University Spring 2023
- Teaching Assistantship, Rutgers University 2022-2025
- Dean's List, University of Colorado Boulder Spring 2018

SKILLS

- Programs: **Python, R, MATLAB, STATA, GAUSS**
- Languages: English (fluent), Mandarin (native)

REFERENCE

Norman R. Swanson (Chair)
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