RAJVEER JAT

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FIELDS OF INTEREST

Theory: Econometric Theory (High-Dimensions, Causal Inference, Non-parametric) & Machine Learning.
Applications: Industrial Organization, Empirical Macro, Finance, Development.

EDUCATION

University of California (UC), Riverside	PhD in *Economics (Field: Econometrics)*	*June'25*
Indian Statistical Institute (ISI), Delhi	MS in *Quantitative Economics*	*May'19*
Indian Institute of Technology (IIT), Roorkee	B. Tech. in *Electrical Engineering*	*May'16*

PEER-REVIWED PUBLICATION

1. "The agricultural productivity gap: Informality matters", **Journal of Development Economics**, Volume 178, 2026, 103617, Link with Bharat Ramaswami.

Abstract: The measured agricultural productivity gap (APG) in developing countries typically compares agriculture with the entire non-farm economy, implicitly treating the latter as homogeneous. In developing countries, most non-farm employment is informal, concentrated in small, unregistered enterprises with low productivity. This paper compares the productivity of agriculture to the informal and formal non-farm sectors in India. Using Indian sectoral data from the India KLEMS database linked with nationally representative labor surveys, we decompose the non-farm economy into formal and informal segments and adjust productivity measures for differences in hours worked, human capital, and labor's share of value-added. We find that the APG is almost entirely driven by the small formal non-farm sector. The gap with the informal sector is negligible. Between 63 and 75 % of non-farm workers are in informal employment dominated industries that are not more productive than agriculture. These results reframe the APG as a formal–informal divide.

WORKING PAPERS

Sufficient Instruments Filter *[Draft]*
[Accepted for the regular session talk in the 2025 California Econometrics Conference.]
Abstract: This paper introduces a novel five-layered deep learning-based tractable procedure to filter out sufficient information from many instruments for estimating parameters in regression models with endogenous regressors. The method draws its merit from three key properties: the ability to incorporate supervision, the flexibility to accommodate non-linearity, and the capability for sufficient dimension reduction. This method is consistent and asymptotically normal when many instruments are correlated. Simulation exercises show that this method consistently achieves lower bias and root mean squared error compared to competing benchmarks, across many specifications. Two real-world applications in industrial organizations(IO) and finance are considered, yielding meaningful insights into causal relationships. The method remains robust when the number of instruments exceeds the sample size, and performs well with weak and even invalid observed instruments, as long as there exists at least one linear combination of common factors among the observed instruments that serves as a valid instrument.

Kernel Three Pass Regression Filter *[Draft]*
with *Daanish Padha* *[R & R in the* Journal of Applied Econometrics*.]*
Abstract: We forecast a single time series using a high-dimensional set of predictors. When predictors share common underlying dynamics, a latent factor model estimated by the Principal Component method effectively characterizes their comovements. These latent factors succinctly summarize the data and aid in prediction, mitigating the curse of dimensionality. However, two significant drawbacks arise: (1) not all factors may be relevant, and utilizing all of them in constructing forecasts leads to inefficiency, and (2) typical models assume a

linear dependence of the target on the set of predictors, which limits accuracy. We address these issues through a novel method: Kernel Three-Pass Regression Filter. This method extends a supervised forecasting technique, the Three-Pass Regression Filter, to exclude irrelevant information and operate within an enhanced framework capable of handling nonlinear dependencies. Our method is computationally efficient and demonstrates strong empirical performance, particularly over longer forecast horizons.

Supervised Instruments in a Data-Rich Environment [Draft: Available on Request]

with *Daanish Padha*

Abstract: We study the estimation of parameters in a regression model with endogenous regressors, focusing on settings where the endogenous variable is related to a large set of exogenous instruments through a small number of unobserved latent factors. We extend the Factor Instrumental Variable (FIV) estimator of Bai & Ng [2010] by introducing supervision into factor estimation: rather than extracting all latent factors using the method of principal components (PC), we apply the Three-Pass Regression Filter (3PRF) to selectively estimate only those factors that are relevant for the endogenous regressor. We refer to this novel estimator as the 3PRF IV estimator. This methodology effectively discards irrelevant factors that could otherwise intro- duce inefficiency into the estimation process. Our framework also accommodates weak factor structures, allowing for the possibility that the factors driving the instruments are weak and that relevant and irrelevant factors may differ in strength. We derive conditions under which asymptotic normality of the structural parameter at a $\sqrt{T}$-rate is attainable. When relevant factors are weak, achieving $\sqrt{T}$-rate asymptotic normality requires the sample size T to grow sufficiently fast relative to the number of instruments N, with even stricter conditions when irrelevant factors are stronger than relevant ones. Monte Carlo simulations demonstrate strong finite-sample performance of our supervised 3PRF IV estimator. An empirical application estimating the New Keynesian Phillips Curve yields coefficient estimates consistent with those in the established literature, thereby validating our approach.

Macro Factors in Bond Risk Premia: Revisited [Draft: Available on Request]

Abstract: This paper revisits the role of macroeconomic factors in explaining bond risk premia. We demonstrate that carefully constructed, supervised macroeconomic factors account for a substantial portion of the variation in bond risk premia—significantly more than previously established in the literature. Furthermore, we find that the principal component-based factors of Ludvigson & Ng (Journal of Financial Studies, 2009) and the financial factors proposed by by Cochrane & Piazzesi (American Economic Review, 2005) lose their explanatory power when conditioned on our supervised macroeconomic factors, whereas the reverse does not hold.

CONFERENCE PRESENTATIONS/ACCEPTANCE/INVITATIONS AND SEMINARS

-Indian Statistical Institute, Delhi Center, India.	Feb 2026
-American University of Sharjah, Sharjah, UAE.	Feb 2026
-The 2026 Asia Meeting of the Econometric Society (AMES-CSW), Abu Dhabi, UAE.	Jan 2026
-European Winter Meeting of the Econometric Society 2025, Nicosia, Cyprus.	Dec 2025
-95th Annual Meeting of the Southern Economics Association, Tampa, FL, USA.	Nov 2025
-35th Annual Midwest Econometrics Group Conference, UIUC, IL, USA.	Oct 2025
-The 2025 California Econometrics Conference, BC, Canada.	Sep 2025
-Indian Statistical Institute, Delhi Center, India.	Aug 2025
-Indian Institute of Technology, Delhi, India.	Aug 2025
-The 13th World Congress of the Econometric Society, Seoul, South Korea.	Aug 2025
-The 2025 International Association for Applied Econometrics Conference (Turin, Italy)	Jun 2025
-University of Guelph, Ontario, Canada.	May 2025
-Southern Illinois University Carbondale, Illinois, USA.	Jan 2025
-Gettysburg College, Pennsylvania, USA.	Jan 2025
-European Winter Meeting of the Econometric Society, Palma de Mallorca, Spain.	Dec 2024
-19th Annual Conference on Economic Growth and Development, Indian Statistical Institute.	Dec 2024
-34th Annual Midwest Econometrics Group Conference, Lexington, KY, USA.	Nov 2024
-Dept. of Economics, University of California, Riverside, CA, USA.	Oct 2024

(*I couldn't travel to some of the invited conferences listed above).

FELLOWSHIPS, HONORS, AND AWARDS

- Fellowship worth USD 2000 for being in the top 10% of the papers accepted in 13th World Congress of Econometric Society (held every 5 years).   2025
- Earle C. Anthony Graduate Student Travel Award worth USD 1950 by UC Riverside.   2025
- Best paper award in the Graduate Student Symposium by UC Riverside.   2025
- Outstanding Teaching Assistant Award by UC Riverside.   2025
- Appointed to Lead University's Graduate Quantitative Methods Center by Graduate Division (UCR)   2024
- Conference Travel Grant Award, Graduate Division, University of California, Riverside   2025, 2024, 2022
- Dean's Distinguished Fellowship, University of California Riverside   2020
- Book Prize Award for Exceptional Academic Performance, Indian Statistical Institute   2018, 2019
- Junior Research Fellowship (JRF) for scoring 99.99 percentile, University Grant Commission, India.   2019
- Graduate Fellowship at Indian Statistical Institute   2018, 2019
- Merit-cum-Means Scholarship, Indian Institute of Technology, Roorkee   2013, 2014, 2015, 2016

REFEREE/REVIEWER SERVICE

-Member of Program Committee, Annual Conference on Economic Growth and Development, the Indian Statistical Institute (Serving as a referee for Econometric Methods, also I'm the youngest member of the committee).
-Reviewer for Macroeconomic Dynamics.
-Reviewer for Journal of Development Economics.
-Reviewer for International Journal of Forecasting.
-Reviewer for Economic Development and Cultural Change.
-Reviewer for Econometric Reviews.

TEACHING

Lead, Graduate Quantitative Methods Center, UC Riverside
- Basic Quantitative Methods for Finance (for MBA, Masters in Finance, MS in Financial Analytics) Fall 2024
- High-dimensional Statistics: Making Sense of Big Data (for PhDs and MS students)   Fall 2024
- Non-parametric Regressions: Inferences and Implementation in R (for PhDs and MS students)   *Winter 2025*
- Macroeconomics and Time Series Econometrics (for Grad students)   *Winter 2025*
- Causal Inference Techniques (for Grad students)   *Winter 2025*

Instructor, Dept. of Economics, UC Riverside
- Economic Development: Theory and Policy (Applications in Python, [Syllabus])   *Summer 2024 [Reviews]*
- Environmental Economics with Applications in R. ([Syllabus])   *Summer 2023 [Reviews]*

Teaching Assistant, Dept. of Economics, UC Riverside
- Econometric Theory III (Graduate level, [Syllabus])   Spring 2024 [Reviews]
- The Stock Market   Fall 2021 [Reviews], Spring 2023 [Reviews], Fall 2023 [Reviews]
- Statistics for Economics   Fall 2022 [Reviews], Winter 2024 [Reviews]
- Intermediate Microeconomics   Summer 2022 [Reviews]
- Introductory Econometrics I   Winter 2023 [Reviews]
- Introduction to Macroeconomics   Winter 2022 [Reviews]
- Introduction to Microeconomics   Spring 2022 [Reviews]

PROFESSIONAL EXPERIENCE

PhD Econometrician, Western Digital, San Jose   Jun'25 - Present
-Solving business problems on structural modeling of pricing decisions and forecasting.

Head, GradQuant, University of California Riverside   Jul'24 - Jun'25
-Led the center for quantitative methods for grad students and post-doc researchers at UC Riverside.

Quant Consultant, Research Triangle Institute (RTI) International   Jul'21 - Sep'21
- Developed statistical models for future cash flow streams to help $10 million investment decision problem.

Quant Research Intern, KPMG   *Jan'20 - Aug'20*
-Solved an expected revenue estimation problem using a constrained optimization framework in Python.

Quant Consultant, Asian Infrastructure Investment Bank (AIIB)   *Nov'19 to May'21*
-Developed mathematical models to guide the statistical pursuit of optimal solutions to investment problems.

C++ Software Engineer, HCL Technologies India   *Oct'16-Jul'17*
-Using object-oriented programming, developed software solutions for business problems.

LEADERSHIP POSITIONS

Head, Graduate Quantitative Methods Center at UC Riverside	2024-2025
General Secretary (Finance), Student Government Body, IIT Roorkee	2014-2015
Class Representative of 2012-2016 Batch of B.Tech. in Electrical Engineering, IIT Roorkee	2012-2014

REFERENCES

Name	Affiliation	Email	Ref. Type
Prof. Tae-Hwy Lee	UC Riverside	taelee@ucr.edu	Research
Prof. Marcelle Chauvet	UC Riverside	chauvet@ucr.edu	Research
Prof. Bharat Ramaswami	Ashoka University	bharat.ramaswami@ashoka.edu.in	Research
Dr. Ruoyao Shi	UC Riverside	ruoyao.shi@ucr.edu	Research
Dr. Silviu Velovici	UC Riverside	silviu.velovici@ucr.edu	Teaching