

# Cong Wang



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## PROFILE SUMMARY

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Econometrician and Data Scientist with a PhD focus on econometric modeling, machine learning, and causal inference techniques, with a strong track record in both academia and industry. Proficient in developing advanced algorithms and analytics for decision-making in high-stakes environments, demonstrated by creating the **Bank Viability Index (BVI)** to evaluate financial stability across multiple metrics at the European Stability Mechanism (ESM).

Published research on **machine learning** applications for stock return prediction and developed a novel causal inference method utilizing **Instrumented Principal Component Analysis (IPCA)**, addressing challenges in high-dimensional data environments by improving causal estimation accuracy and robustness, with applications in finance and policy analysis. Experienced in Python, R, SQL, and data visualization tools, with a proven ability to translate data into actionable insights. Excels at bridging statistical modeling, data engineering, and business impact, aligning closely with data-driven culture.

## RESEARCH INTEREST

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Primary field:	Causal inference
Secondary field:	Econometrics, Machine learning
Industry related:	Policy analysis, Market Intelligence

## EDUCATION

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**Sapienza University of Rome**

*PhD in Economics*

**University of California, Los Angeles**

*Visiting PhD Researcher*

**Barcelona School of Economics**

*Summer School*

**HSE University**

*MSc in Finance*

**University of Amsterdam**

*QTEM Programme*

**Shenyang Ligong University**

*BSc in Engineering*

**Rome, Italy**

*Expected in May 2025*

**Los Angeles, United States**

*Mar 2023 – Sep 2023*

**Barcelona, Spain**

*Jun 2022 - Jul 2022*

**St. Petersburg, Russia**

*Sep 2018 - Jun 2020*

**Amsterdam, the Netherlands**

*Sep 2019 – Feb 2020*

**Shenyang, China**

*Sep 2012 - Jun 2016*

# PROFESSIONAL EXPERIENCE

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**European Stability Mechanism, Chief Economist Department**  
*Financial Sector Analyst*

**Luxembourg**  
5.2024 – now

- Developed and **optimized data-driven tools**: Enhanced the Bank Viability Index (BVI) algorithm with Python to assess financial stability across metrics such as profitability, asset structure, asset quality, capital adequacy, and liquidity, improving risk monitoring for systematically important Euro Area banks.
- Optimized **early warning systems**: Created predictive models for financial risks, such as detecting the transition of loans to Stage 3, offering a robust warning signal system for loan performance deterioration.
- Designed advanced analytical solutions: Conducted macro-financial research using econometric models and data visualization techniques, providing actionable insights for financial sector monitoring and policymaking. Key deliverables included reports on Basel III reforms, sovereign-bank nexus risks, and capital market developments.
- Leveraged **automation and machine learning**: Utilized programming and statistical tools to analyze vast datasets, streamline reporting processes, and deliver actionable business intelligence for internal and external stakeholders.

**University of California, Los Angeles, Department of Economics**  
*Visiting Researcher*

**LA, The United States**  
3.2023 – 9.2023

- Developed a **novel causal inference method** leveraging Instrumented Principal Component Analysis (IPCA) to improve causal estimation in high-dimensional datasets, with applications in finance and policy evaluation.
- Conducted econometric training and research in causal inference, focusing on advanced methods for identifying and quantifying causal relationships in economics.
- Designed and implemented data-driven econometric workflows, including advanced visualization, machine learning integration, and statistical modeling for cutting-edge economic research.

**China Life Asset Management, Market Research Division**  
*Market Analyst*

**Guangzhou, China**  
7.2020 – 9.2021

- Streamlined workflows by developing a **data visualization tool** to enhance team efficiency in analyzing market trends and presenting insights.
- Produced in-depth sectoral and company reports, integrating econometric insights to support data-driven investment decisions.

**Cbonds, Research Department**  
*Fixed Income Analyst*

**Saint Petersburg, Russia**  
9.2019 – 2.2020

- Built a database for Panda bond, streamlining the collection, analysis, and reporting of fixed income data.
- Designed and deployed a user interface for bond market information, enhancing accessibility and real-time decision-making for stakeholders.

## SCHOLARSHIPS & AWARDS

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University of Rome International Mobility Scholarship	2022
University of Rome fully founded Ph.D. Scholarship	2021
QTEM Honored Graduate Diploma	2020
HSE University International Mobility Scholarship	2019
HSE University Scholarship	2018

## CONFERENCE & WORKSHOP

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<b>2024 European Winter Meeting of the Econometric Society</b> The Econometric Society.	<b>Palma De Majorca, Spain</b> Dec 2024
<b>Central Bank Research Association (CEBRA) Conference</b> European Stability Mechanism.	<b>Luxembourg</b> Nov 2024
<b>ESM Policy Conference</b> European Stability Mechanism.	<b>Luxembourg</b> Nov 2024
<b>12th IEA Workshop in Econometrics and Empirical Economics</b> Italian Econometric Association.	<b>Bertinoro, Italy</b> Sep 2024
<b>IMF Financial Programming and Policies Workshop</b> European Stability Mechanism.	<b>Luxembourg</b> Jun 2024
<b>Climate and the Environment Mini-Conference</b> University of California, Los Angeles.	<b>Los Angeles, USA</b> Aug 2023
<b>2023 North American Summer Meeting (NASM)</b> The Econometric Society.	<b>Los Angeles, USA</b> Jun 2023
<b>CCPR Differences-in-Differences Mini-Conference</b> University of California, Los Angeles.	<b>Los Angeles, USA</b> May 2023
<b>Empirical Tools/Applications in Banking and Macro-Finance</b> Barcelona School of Economics, summer school.	<b>Barcelona, Spain</b> Jul 2022
<b>Workshop on Demand System Asset Pricing</b> Held by Ralph S.J. Koijen and Motohiro Yogo.	<b>Online</b> Jun 2022
<b>Innovation, Growth, and Production. Models &amp; Data Analysis</b> Sapienza, University of Rome. Advanced Course 2022, 17th Edition.	<b>Rome, Italy</b> May 2022

## SKILLS

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**Programming Language:** Python (Expert), R (Advanced), MATLAB (Intermediate)  
**Data Visualization:** Power BI (Expert), Tableau (Advanced)  
**Data Management:** SQL (Expert)  
**Data Terminals:** Bloomberg terminal (Expert), Refinitiv Eikon (Expert)  
**Human Language:** Chinese (Native), English (Proficient), Russian (Intermediate)

## REFERENCES

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[Giacomo Morelli](#) (PhD Supervisor)  
Assistant Professor  
Sapienza University of Rome  
[giacomo.morelli@uniroma1.it](mailto:giacomo.morelli@uniroma1.it)

[Valeria Patella](#)  
Assistant Professor  
Sapienza University of Rome  
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[Juan Sole](#)  
Principal Economist  
European Stability Mechanism  
[j.sole@esm.europa.eu](mailto:j.sole@esm.europa.eu)

# PUBLICATIONS

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## Counterfactual and Synthetic Control Method: Causal Inference with Instrumented Principal Component Analysis

### Job Market Paper

**Abstract:** In this paper, we propose a novel method for causal inference within the framework of counterfactual and synthetic control. Matching forward the generalized synthetic control method, our instrumented principal component analysis method instruments factor loadings with predictive covariates rather than including them as regressors. These instrumented factor loadings exhibit time-varying dynamics, offering a better economic interpretation. Covariates are instrumented through a transformation matrix,  $\Gamma$ , when we have a large number of covariates it can be easily reduced in accordance with a small number of latent factors helping us to effectively handle high-dimensional datasets and making the model parsimonious. Moreover, the novel way of handling covariates is less exposed to model misspecification and achieved better prediction accuracy. Our simulations show that this method is less biased in the presence of unobserved covariates compared to other mainstream approaches. In the empirical application, we use the proposed method to evaluate the effect of Brexit on foreign direct investment to the UK.

## Firms' Carbon Emissions and Stock Returns

### Working paper

**Abstract:** In recent years, the surge in unanticipated climate change risk has led to green assets outperforming their brown counterparts, a trend that contradicts the theoretical expectation that brown assets, exposed to higher risk associated with climate change, should achieve higher return compensations. This paper presents empirical evidence from the US stock market, utilizing both portfolio and individual stock analyses, to elucidate this discrepancy. Our findings reveal that, from 2002 to 2021, green portfolios, characterized by lower carbon emissions, consistently outperform brown portfolios. Similar patterns are observed at the firm level. We propose that unexpected concerns about climate change have shifted market preferences, leading to a differential demand shock for green and brown assets. This shift in preference is a key factor driving the superior performance of green assets over their brown counterparts.

## Stock Return Prediction with Multiple Measures Using Neural Network Models

### Published on *Financial Innovation*

**Abstract:** In my research on empirical asset pricing, I investigated the performance of machine learning methods in predicting stock returns using various factor models. My findings demonstrated that neural network models consistently perform well with firm-specific variables, and their accuracy significantly improves with the inclusion of macroeconomic factors such as financial market data, economic activities, and investor sentiment. This improvement varies across different stock return measures. Additionally, I identified notable differences in model performance and variable importance when comparing abnormal returns from Fama–French models to excess returns, highlighting the complex interplay between factor models, stock returns, and macroeconomic conditions.