

TIMOTHY H. SAVAGE, PH.D. CRE

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Timothy H. Savage is a Clinical Assistant Professor of Real Estate at the NYU Schack Institute of Real Estate, where he is the Program Coordinator of Data Analytics and the Faculty Director of the CREFC Center for Real Estate Finance. He is also a member of the Counselors of Real Estate (CRE). He is the former Senior Managing Economist and Principal Data Scientist of CBRE Econometric Advisors (the former Torto Wheaton Research Group). Tim is an economist with nearly 20 years of experience at international consulting firms such as Charles River Associates and Navigant Consulting. His focus is the use of machine learning to evaluate business strategy, in particular the uses of statistical analysis and Monte Carlo simulation. He speaks frequently to institutional investors in commercial real estate on macroeconomics, monetary and fiscal policy, and the potential impacts of big data and technological disruption. His research has been twice discussed in the Economist, and he has addressed the National League of Cities on uses of big data in policymaking. His commentary has appeared in the Economist, Vox Media and the Wall Street Journal. Tim is a Distinguished Fellow of the NAIOP Research Foundation, where he provides industrial and office demand forecasting for the benefit of the industry. He holds a Ph.D. in economics from the University of North Carolina at Chapel Hill.

PROFESSIONAL EXPERIENCE (ACADEMIC)

Clinical Assistant Professor of Real Estate, Schack Institute of Real Estate, NYU

- Inaugural Faculty Director of the CREFC Center for Real Estate Finance at NYU Schack.
- Using a grant from Schack Advisory Board Member David Hirsh, assisted in the development of a curated, one-year curriculum for the Masters of Science in Real Estate Finance (MSRE).
- Based on industry experience, developed a curriculum on data analytics and commercial real estate. Topics include classical hypothesis testing, regression, classification, time series analysis, Bayesian analysis and causal inference, and deep learning.
- Expanded scope of non-credit offerings with an industry-first “Certificate in Real Estate Data Analytics.”

Visiting Scholar, Center for Urban Science and Progress (CUSP), Tandon School of Engineering, NYU

- Developed a graduate-level course in applied statistical learning.
 - Synthesized statistics, econometrics and machine learning to cover classical hypothesis testing, regression, classification, deep learning, Bayesian inference and time series analysis.
- Spring 2018 presented a special course on time series modeling and Markov processes used in real estate finance.
- With CUSP computer scientist, implemented a random-forest learner to massive data on all taxi rides in NYC over a five-year period of time to contribute to recent ideas that combine big data and causal inference.
- Assisted in the development of a unique economic map of New York City that synthesizes a large number of public and non-public data sources for predictive modeling of local business success.
- Led an effort to parallelize a semi-supervised algorithm for potential use with high frequency trading data.

SELECT PUBLICATIONS AND PRESENTATIONS

- “Macroeconomics and Real Estate: 1929 and Today,” NYU Schack Institute of Real Estate, New York City, August 2020.
 - “The Theory That Would Not Die: How Bayes’ Rule Cracked the Enigma Code, Hunted Down Russian Submarines, and Emerged Triumphant from Two Centuries of Controversy,” Book Review, *Journal of Real Estate Literature*, 27(1), 2019.
 - “Machine Learning and Finance: Through the Ages,” Cambridge Innovation Center, June 2018.
 - “Potential Impacts of Technological Change,” PREA Conference, Austin, May 2018.
 - “Emerging Tech Cities and Why You Should Care,” CBRE Multifamily Conference, Chicago, April 2018.
 - “Deep Learning and Finance: Here We Go Again,” National Association of Business Economists (NABE) Tech Economics Conference, Seattle, November 2017.
 - “Big Data and CRE,” CBRE-EA Annual Client Conference, Washington, DC, September 2017.
 - “The Implications of Automation for Commercial Real Estate,” CBRE-EA Annual Client Conference, Denver, September 2016.
 - “Big Data, Simulation and Causation,” 10th Annual Machine Learning Symposium, New York Academy of Science, New York City, March 2016.
 - “Tools and Uses of Big Data,” National League of Cities, Washington, DC, March 2015.
 - Participant, President’s Forum on Data, University at Albany, SUNY, Albany, February 2015.
 - “Putting the Human Back into Machine Learning,” Distinguished Panel on Big Data and (Big) Business, CIBAM, University of Bath, UK, May 2014.
 - “Cities of Opportunity 6,” Price Waterhouse Coopers, 2014.
 - “Yellow Cabs as Red Corpuscles,” IEEE Workshop on Big Data and Smarter Cities, San Francisco, October 2013.
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- “The Adverse Impact of Particulate Matter on Property Values,” *International Real Estate Review*, Vol. 15, Issue 2 (Summer) 2012.
- “Comments on Risk and Exposure Assessment to Support the Review of the SO₂ Primary National Ambient Air Quality Standards: First Draft.” Clear Air Science Advisory Committee (CASAC) and the U.S. Environmental Protection Agency, July 2008.
- “The Long-Term Effects of Youth Unemployment,” *Journal of Human Resources*, Vol. 41, No. 2, pp. 259–293.
- “Methods and Results from a New Survey of Values for Eastern Regional Haze Improvements,” *Journal of the Air and Waste Management Association*, Vol. 55, No. 11.
- “Nonuser Valuation of Haze Reduction in Eastern National Parks,” September 2005.

SELECT PUBLIC TESTIMONY

- “Comments on the Risk and Exposure Assessment to Support the Review of the SO₂ Primary National Ambient Air Quality Standards: First Draft.” Prepared on behalf of the Utility Air Regulatory Group, August 2008.
 - “Further Analysis of Econometric Evidence that Satellite Radio and Terrestrial Radio Are Demand Substitutes.” Submitted in Federal Communications Commission Media Bureau Docket No. 07-57, January 2008.
 - “Econometric Analysis of the Relationship between Satellite Radio Penetration and Terrestrial Radio Coverage.” Submitted in Federal Communications Commission Media Bureau Docket No. 07-57, November 2007.
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