

# TIMOTHY H. SAVAGE, PH.D. CRE

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Timothy H. Savage is a Clinical Assistant Professor at the NYU Schack Institute of Real Estate, where he is the Faculty Director of the CREFC Center for Real Estate Finance. 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 25 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 Bayesian analysis and Monte Carlo simulation. He speaks frequently to institutional investors in 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 and the National Association of Realtors on macroeconomics and monetary policy. His comments have appeared in Axios, The Commercial Observer, The New York Post, The New York Times, GlobeSt, PERE Magazine, Pix 11, PropModo, the Wall Street Journal and Vox Media. He is a Former Distinguished Fellow of the NAIOP Research Foundation, a member of the invitation-only Counselors of Real Estate (CRE) and a mentor at the Real Estate Research Institute (RERI). Tim holds a Ph.D. in economics from the University of North Carolina at Chapel Hill with concentrations in microeconomics and econometrics.

## EDUCATION

Ph.D., Economics, The University of North Carolina at Chapel Hill 1999  
B.A., Economics and Mathematics, The University of Maryland - College Park 1990

## PROFESSIONAL EXPERIENCE (ACADEMIC)

Clinical Assistant Professor of Real Estate, NYU Schack Institute of Real Estate Sep 2018 - Present

- [Inaugural Faculty Director](#) of the CREFC Center for Real Estate Finance at NYU Schack, where I developed a best-in-class certificate in commercial real estate finance for the Commercial Real Estate Finance Counsel.
- Faculty Member of NYU Self-Study Group on Excellence in Education, part of NYU's re-accreditation with the Middle States Commission of Higher Education.
- [Inaugural Faculty Director](#) of Hirsh Fellows Program at NYU Schack, where I substantially revised key syllabi in the MSRE finance concentration.
- Former Faculty Member of the [NYU Committee on Technology-Enhanced Education](#), advising NYU leadership on the use of technology to improve pedagogy.
- 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, causal inference and deep learning. The curriculum has been replicated at other major academic institutions, such as MIT and Wharton.
- Expanded the scope of non-credit NYU offerings with an industry-first Certificate in Real Estate Data Analytics, as well as the CREFC Certificate in Real Estate Finance.

Visiting Scholar, Center for Urban Science and Progress, NYU Tandon School of Engineering Sep 2014 - Aug 2018

- Developed a graduate-level course in [applied machine 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 finance.
  - With a 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.
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## PROFESSIONAL EXPERIENCE (NON-ACADEMIC)

Senior Managing Economist and Principal Data Scientist, CBRE Econometric Advisors Apr 2016 - Jan 2019

- Senior Managing Economist and Principal Data Scientist of CBRE Econometric Advisors (CBRE EA).
- Chief American economist.
- Extensive market-facing and media-facing industry engagement.
- Provided economic expertise and thought leadership about the U.S. economy and its implications for CRE owners and investors, addressing all CRE asset types.
- Supervised a team of over 20 economists and analysts with an annual budget of over \$12 million.
- Restructured the team to reflect modern ETL processes, including the development of a first-in-industry API.
- Redeveloped the statistical forecasting models to reflect modern techniques of time-series analysis.
- Frequently involved in business development and new client acquisition.
- Responsible for organizing an annual client conference, at which I regularly presented.
- *Ad hoc* consultant between Sept 2018 and Jan 2019.

Managing Director, Finance Scholars Group (acquired by Berkeley Research Group) Nov 2011 - Mar 2016

- Oversaw a multimillion dollar project evaluating the performance of the London Interbank Offered Rate (LIBOR) during the global financial crisis.
- Engaged in regular business development activities in the areas of financial engineering.

Principal, Navigant Consulting, Inc. Nov 2008 - Oct 2011

- Managed a group of ~5 economists and analysts focused on using statistical analysis to address large-scale class action matters.
- Developed an internal training course on the emerging idea of big data analytics.

Various titles, Charles River Associates, Inc. Jun 1999 - Oct 2008

- Focused on large merger activity using statistical models to assess potential anti-competitive implications of mergers. Deals included AOL-Time Warner and Sirius-XM Radio.
- Oversaw fixed-priced engagements focused on environmental economics.
- Assisted in the development of a Financial Economics Practice focused on issues of fair lending in real estate.

## SELECT PUBLICATIONS AND PRESENTATIONS

- “[A Private Equity Firm Might Be Your Next Landlord](#),” The New York Times, August 15, 2023.
  - “[The Strong Dollar Is a Double-Edged Sword for Real Estate Investors](#),” Propmodo, October 14, 2022.
  - “Proptech Through the Ages,” Counselors of Real Estate 2022 Annual Convention, Boston, MA, September 13, 2022.
  - “Inflation and Interest Rates: Some Clarity to Mixed Macroeconomic Signals,” *Real Estate Issues*, 46(3), August, 2022.
  - “[AI and Machine Learning for Real Estate Forecasting](#),” 38<sup>th</sup> Annual American Real Estate Society, April 7, 2022.
  - “What Do Real Estate Firms Want to See in Newly-Minted Graduates?” 38<sup>th</sup> Annual American Real Estate Society, April 8, 2022.
  - “[Implications of the Current Economic Cycle for CRE](#),” Schack Institute of Real Estate, New York City, December 8, 2021.
  - “[How To Love the Economic Recovery](#),” Schack Institute of Real Estate, New York City, June 2, 2021.
  - NYU CREFC Center’s Big Ideas Course on “Technological Disruption to Commercial Real Estate,” March - May 2021.
  - “2020 NAR Real Estate Forecast Summit: Post-Election Outlook,” December 2020, [National Association of Realtors](#).
  - “Q3 2020 Office Space Demand Forecast,” November 2020, NAIOP Research Foundation.
  - “Q2 2020 Industrial Space Demand Forecast,” August 2020, NAIOP Research Foundation.
  - “[Macroeconomics and Real Estate: 1929 and Today](#),” NYU Schack Institute of Real Estate, New York City, August 2020.
  - “[5 Questions with Professor Timothy Savage](#),” May 2020, NYU Alumni Organization.
  - “Q1 2020 Office Space Demand Forecast,” March 2020, NAIOP Research Foundation.
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- [“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,”](#) 10<sup>th</sup> 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.
- “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 SO<sub>2</sub> 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 SO<sub>2</sub> 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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