

## Andreas D. Christopoulos, Ph.D.

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### Full-Time Professional Academic Appointments

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YESHIVA UNIVERSITY, SY SYMS SCHOOL OF BUSINESS (NEW YORK, NY)	2018-PRESENT
Assistant Professor of Finance & Real Estate (Tenure Track); Vice Chair – Dept of Finance; Director – Mitzner MSRE	
RICE UNIVERSITY, JONES GRADUATE SCHOOL OF BUSINESS (HOUSTON, TX)	2017-2018
Assistant Professor of Finance (1-Year Visiting Appointment)	
UNIVERSITY OF TEXAS AT AUSTIN, MCCOMBS SCHOOL OF BUSINESS (AUSTIN, TX)	2015-2017
Assistant Professor of Finance (2-Year Visiting Appointment)	
UNIVERSITY OF SCRANTON, KANIA SCHOOL OF MANAGEMENT (SCRANTON, PA)	2014-2015
Assistant Professor of Finance (1-Year Visiting Appointment)	
RUTGERS UNIVERSITY, RUTGERS BUSINESS SCHOOL, (NEWARK & NEW BRUNSWICK, NJ)	2011-2014
Teaching Assistant and Lecturer of Finance	

### Full-Time Professional Non-Academic Appointments

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NOMURA (NEW YORK, NY)	2007-2008
Director, Head of CMBS Risk Management	
<ul style="list-style-type: none"><li>• Managed risks of ~\$3B portfolio of CMBS, CMBX, CRE CDOs &amp; CRE Mortgages (credit, market, liquidity risks).</li><li>• Managed team of 3 risk professionals.</li><li>• Risk's representative on Global Credit Committee; solo authority for loans &lt;\$50mm; joint authority &gt;=\$50mm.</li><li>• Produced highly accurate valuations of Level 3 assets agreed to by Global Heads of Risk, CEO, and CFO.</li><li>• Designed long/short strategies using CMBX; advised Tokyo and New York; worked with trading to implement.</li><li>➤ <u>Key Results</u>: Generated profit of ~\$35mm; prevented ~\$150mm in mark-to-market losses; Department eliminated with global reorganization during the Great Financial Crisis; Bonus and Salary paid in-full.</li></ul>	
WOTN, LLC (ITHACA, NY)	2001-2007
CEO & Co-Founder	
<ul style="list-style-type: none"><li>• Co-founded this risk management/ratings financial technology company with Robert Jarrow; Trepp, LLC; and Cornell University to create the 1<sup>st</sup> independent simulation-based risk management platform for CMBS.</li><li>• Managed cross-functional team of 15 research scientists, counsel, partners, and outsourced developers.</li><li>• First mover in providing <i>daily</i> valuation of ~\$1T CRE/CMBS Universe with high-performance computing.</li><li>• Leveraged Trepp trade quality data and technology to determine path dependent values of loans and bonds.</li><li>• Raised \$2.1mm in preferred equity and debt to develop and market product.</li><li>➤ <u>Key results</u>: Secured Patent US8788404 B1; preserved all IP &amp; for re-launch; 2020 soft re-launch with new product 'RiskTape' (<a href="https://risktape.warg.wotrisk.com/">https://risktape.warg.wotrisk.com/</a>) capturing live universe risk decomposition pricing in 15 second intervals, <i>intraday</i>.</li></ul>	
JP MORGAN CHASE (NEW YORK, NY)	1997-2001
Director, Head of CMBS Research (1999-2001)	
<ul style="list-style-type: none"><li>• Lead the 1<sup>st</sup> CMBS research group for Chase</li><li>• Managed team of 2 researchers and outsourced technology development.</li><li>• Wrote weekly and monthly research reports on fundamental credit and relative value; track record of correct calls.</li><li>➤ <u>Key results</u>: Helped create 'Tier 1' brand for Chase CMBS; Developed business relationships through research; Developed internal analytics; Job eliminated in merger; Bonus and Salary paid in-full.</li></ul>	
Vice President, CMBS Trading (1998-1999)	
<ul style="list-style-type: none"><li>• Developed credit, structural and market risk analysis for CMBS products in new issue and secondary market.</li><li>➤ <u>Key results</u>: Profitable B-piece valuations for banking/origination, sales, trading, and risk.</li></ul>	
Associate, CMBS Trading (1997-1998)	
<ul style="list-style-type: none"><li>➤ <u>Key results</u>: Responsible for hedging multi \$billion conduit loan and securities book; some market making.</li></ul>	
LEHMAN BROTHERS (NEW YORK, NY)	1992-1995
Analyst, Mortgage & ABS Research, Banking and Structuring	
<ul style="list-style-type: none"><li>• Wrote weekly reports on credit, prepayment, and relative risk. Analyst contribution in structuring and banking.</li><li>➤ <u>Key results</u>: Wrote "Introduction to VA Vendee Securities" and provided support on numerous new issue ABS.</li></ul>	

### Research

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#### *Published and Forthcoming*

- Christopoulos, A.D., and Jarrow, R.A., "CMBS market efficiency: The crisis and the recovery", 2018, *Journal of Financial Stability*. Vol 36, 159-186.
- Christopoulos, A.D., "The composition of CMBS risk", 2017, *Journal of Banking and Finance*. Vol 26, 215-239.
- Christopoulos, A.D., "The impact of different default triggers in CMBS risk evaluation", 2017, *Journal of Investment Management*. Vol 15, No. 2, 1-26.

Christopoulos, A.D., and Barratt, J.G., "Credit risk findings for commercial real estate loans using the reduced form", 2016, *Finance Research Letters*. Vol 19, 228-234.

Christopoulos, A.D., and Jarrow, R.A., et al., "Structured Finance Securities Option Pricing Architecture and Process", 2014, *United States Patent and Trademark Office*. US8788404 B1.

Christopoulos, A.D., Jarrow, R.A., and Yildirim, Y., "Commercial Mortgage Backed Securities (CMBS) and Market Efficiency with Respect to Costly Information", 2008, *Real Estate Economics*. Vol 36, Issue 3, 441-498.

#### **Working Papers**

"15 seconds to alpha: Higher frequency risk pricing for commercial real estate securities" (with J.G. Barratt, 2022); *Under review*.

"Liquidity risk and CMBX microstructure" (with J.G. Barratt, 2022); *Under review*.

"Synthetic Cap Rate Indices (1991-Covid era)" (with J.G. Barratt and D.C. Ilut, 2022); *Under review*.

"National cap rates and the macroeconomy" (with J.G. Barratt and D.C. Ilut, 2022); *Under review*.

"The Absolute Roll Measure" (2021).

#### **Works in Progress**

"Revisiting the formation of commercial mortgage risk premia" (with S. Titman and S. Tompaidis).

"The fragility of liquidity in CMBX and Corporate bonds".

### **Research Conferences and Seminars (Speaker (\*), Panelist, Discussant, and Chairman)**

#### **Speaker (\*) Presenting "15 seconds to alpha..."**

\*7<sup>th</sup> Annual Economics of Financial Technology Conference, University of Edinburgh, Edinburgh, Scotland 2022-05

\*10<sup>th</sup> Annual New Zealand Finance Meeting, Auckland University of Technology, Auckland, New Zealand 2021-12

• *and Discussant: Li, Sida and Mao Ye ` The Tradeoff between Discrete Pricing and Discrete Quantities`*

\*2021 Derivatives Conference, Auckland Centre for Financial Research, Auckland, New Zealand 2021-09

• *and Discussant: Procasky, William and Anwen Yin "Price discovery & cross-market information flow in CDS"*.

\*Yeshiva University, Sy Syms School of Business, Summer Seminar Series, New York, NY 2021-07

\*Ecole Hôtelière de Lausanne, Hospitality Finance and Economics Conference, Lausanne, Switzerland 2021-07

• *and Discussant: Woltering, René-Ojas., "Developing a European Hotel Transaction Price Index"*.

#### **Speaker (\*) Presenting "Introducing synthetic cap rate indices for US commercial real estate"**

\*USC Architecture, Fall Symposium – Architecture, the City and Democratic Capitalism, Los Angeles, CA 2019-10

\*Ecole Hôtelière de Lausanne, Hospitality Finance and Economics Conference, Lausanne, Switzerland 2019-06

\*American Real Estate and Urban Economics Association National Summer Conference, Washington, DC 2019-05

\*Stockholm Business School, 2019 Future of Financial Innovation, Stockholm, Sweden 2019-05

\*American Real Estate Society, 35<sup>th</sup> Annual Conference, Paradise Valley, AZ 2019-04

\*Eastern Economic Association, 45<sup>th</sup> Annual Conference, New York, NY 2019-03

\*Blackrock, Solo Invitational Seminar on CRE and CMBS Risk Research, New York, NY 2018-12

\*UNC Chapel Hill Kenan-Flagler, Invitational Third Annual Conference on Real Estate, Chapel Hill, NC 2018-10

• *Panelist: Stanton, R., Strickland C., and Wallace, N., "A New Dynamic House-Price Index for Mortgage Valuation and Stress Testing" (with R. Valkanov (Chair) and D. Hu)*.

\*American Real Estate and Urban Economics Association, National Summer Conference, Washington, DC 2018-06

• *and Discussant: An, X. et al., "Reputation, Information & Herding in CMBS Credit Ratings"*.

#### **Speaker (\*) Presenting "CMBS Market Efficiency: The Crisis and the Recovery"**

\*Midwest Finance Association, Annual Meeting, San Antonio, TX 2018-03

• *and Session Chairman: Financial Markets and Financial Crises*

Baylor University, Lone Star Finance Conference, Waco, TX 2017-09

• *Discussant: Kruger, S. and Maturana, G., "Collateral Misreporting in the RMBS market"*.

#### **Speaker (\*) Presenting "The composition of CMBS risk"**

\*NYU Stern, NYU Salomon, and Standard & Poor's 6th Annual Spring Symposium: CRE Risk, New York, NY 2017-05

American Real Estate and Urban Economics Association, National ASSA/AFA Conference, Chicago, IL 2017-01

• *Discussant: Riddiough, T. and Zhu, J., "Risk and information tranching..."*.

## University Teaching

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Yeshiva University, Sy Syms School of Business (Full-Time, Tenure Track Research)	2018-Present
<ul style="list-style-type: none"> <li>• <b>MSRE</b>: RE Finance, RE Capital Markets, RE Fusion &amp; Analytics, RE Practicum (Capstone), RE Titans.</li> <li>• <b>BBA</b>: RE Finance, RE Capital Markets, RE Titans, Fixed Income, Corp. Fin. (Capstone), Corp. Fin. (Intro).</li> </ul>	
Rice University, Jones Graduate School of Business (Full-Time, 1-year Appointment)	2017-2018
<ul style="list-style-type: none"> <li>• <b>MBA</b>: RE Practicum (Capstone), Corp. Fin. Policy (Adv), Corp. Inv. Policy (Adv), Capital Markets &amp; Crises.</li> </ul>	
University of Texas at Austin, McCombs School of Business (Full-Time, 2-year Appointment)	2015-2017
<ul style="list-style-type: none"> <li>• <b>MBA, MSF and BBA</b>: Risk Management, Case Studies in Capital Markets.</li> </ul>	
University of Scranton, Kania School of Management (Full-Time, 1-year Appointment)	2014-2015
<ul style="list-style-type: none"> <li>• <b>BBA</b>: Investments, Portfolio Management, Corp. Fin. (Intro)</li> </ul>	
Rutgers University, Rutgers Business School (Ph.D. Student)	2013-2014
<ul style="list-style-type: none"> <li>• <b>MBA and BBA</b>: Corp. Fin. (Intro)</li> </ul>	
New York University, School of Professional Studies (Part-Time, Adjunct)	2011-Present
<ul style="list-style-type: none"> <li>• <b>MS in Management and Systems</b>: Quantitative Models, Quant Projects (Capstone), Corp. Fin. (Intro)</li> </ul>	

## University Service

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Yeshiva University, Sy Syms School of Business	
<ul style="list-style-type: none"> <li>• Vice Chairman: Department of Finance</li> <li>• Academic Director: Yeshiva University Real Estate Programs (MSRE &amp; BBA)</li> <li>• Research Seminar Series</li> <li>• Research Development Committee (all departments)</li> <li>• Bloomberg and Excel Implementation Committee (MSRE &amp; BBA)</li> <li>• Search Committee for Tenure Track Faculty - Finance</li> <li>• Search Committee for Executive Director of Graduate School Operations (all departments)</li> <li>• Dean's Working Group: Online Graduate Program Development (MSRE &amp; MBA)</li> <li>• Curriculum Design Committee: Department of Finance</li> <li>• Provost's Working Group: Covid-19 Safety and Educational Planning (all Yeshiva University)</li> </ul>	<p>2021-Present</p> <p>2018-Present</p> <p>2021-2022</p> <p>2021-2022</p> <p>2021-2022</p> <p>2021-2022</p> <p>2020-2021</p> <p>2020-2021</p> <p>2018-2019</p> <p>2020</p>
Rice University, Jones Graduate School of Management	
<ul style="list-style-type: none"> <li>• Program Committee: FMA Applied Finance Conference</li> </ul>	2018-05
University of Texas at Austin, McCombs School of Business	
<ul style="list-style-type: none"> <li>• Reviewer: Texas Finance Festival</li> </ul>	2017-04

## Organizations

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American Finance Association (AFA)  
 American Real Estate and Urban Economics Association (AREUEA)  
 Beta Gamma Sigma Honor Society  
 Commercial Real Estate Finance Council (CREFC)  
 Golden Key International Honor Society  
 Midwest Finance Association (MFA)

## Professional Certifications

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NASD Series 7 and Series 63

## Education

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RUTGERS UNIVERSITY, RUTGERS BUSINESS SCHOOL (NEWARK & NEW BRUNSWICK, NJ)	2011-2014
Doctor of Philosophy, Quantitative Finance <ul style="list-style-type: none"> <li>• <b>Dissertation</b>: "Comparisons and extensions of structural and reduced form approaches to the pricing of commercial real estate securities and loans in the financial crisis &amp; the recovery".</li> <li>• <b>Committee</b>: R.A. Jarrow (<i>co-Chair</i>, Cornell), D. Jones (<i>co-Chair</i>, Rutgers), S.A. Ravid (Yeshiva, 1<sup>st</sup> Rutgers Advisor), A. Ruszczyński (Rutgers).</li> <li>• <b>Honors</b>: Rutgers Funded Ph.D. Scholar; Dean's Research Award in Finance (2012); Beta Gamma Sigma Honor Society; Golden Key International Honor Society; GPA: 3.7/4.0; GRE:1560 (790M/770V).</li> </ul>	
CORNELL UNIVERSITY, JOHNSON GRADUATE SCHOOL OF MANAGEMENT (ITHACA, NY)	1995-1997
Master of Business Administration, Finance	
VASSAR COLLEGE (POUGHKEEPSIE, NY)	1984-1989
Bachelor of Arts, Independent Major Philosophy and Literature	

## Select Abstracts of Research

### **Structured finance securities option pricing architecture and process. 2014, United States Patent US8788404 B1.**

This invention relates generally to a method and systems for evaluating embedded options of structured-finance securities, and, more particularly, to the process of reducing theoretical financial engineering methods to computational instructions. In the current embodiment it provides a method and system for valuing structured-finance securities, such as, but not limited to, commercial mortgage-backed securities (CMBS).

### **The composition of CMBS risk. 2017, Journal of Banking and Finance, Vol 76, pp. 215-239.**

This paper identifies the put-option, liquidity availability proportion, and shadow liquidity risk premia embedded within commercial mortgage backed securities (CMBS) using reduced form and structural generalization models. These risk values are then interpreted as trading signals which are tested with automated trading strategies that buy undervalued and sell overvalued CMBS from November 2007 through June 2015. All three signals generate substantial positive trading profits in testing for the reduced form model but not for the structural generalization. The risk signals constructed independently of market pricing provide more profitable automated trading insights than those constructed from interactions between modeled risk measures and market spreads. In my tests of the information content of the risk signals with respect to future macroeconomic indicators, I find statistically significant evidence in keeping with recent studies. While I cannot reject CMBS efficiency, this paper's disclosure of new risk measures, the profitability of automated strategies based on those risk measures, and the statistical significance of their forward guidance capabilities, together contributes to our understanding of CMBS risk and the credit spread puzzle debate.

### **CMBS market efficiency: The crisis and the recovery. 2018, Journal of Financial Stability, Vol. 36, pp. 159-186.**

This paper presents a reduced form credit risk model to study CMBS pricing and CMBS market efficiency during and after the credit crisis with a comprehensive loan, bond, and deal level data set. Using a model determined fair value, an automated trading strategy based on a newly determined risk ratio buys undervalued and sells overvalued CMBS. These strategies result in substantial trading profits between November 2007 and June 2015. Controlling for CMBS sector risk factors, we reject CMBS market efficiency over the entire sample period. When we split the sample into the Crisis and Recovery periods, we observe persistent abnormal returns over both subperiods, which is consistent with an inefficient CMBS market. Because the CMBS market appears to be inefficient, our results suggest that the approach presented in this paper may facilitate the increased financial stability of the CRE sector through the better pricing and risk management of CMBS.

### **15 seconds to alpha: Higher frequency risk pricing for commercial real estate securities. 2022, Under review.**

In this paper we estimate risk decompositions at intraday frequency for commercial real estate securities in 1560 intervals of fifteen seconds for 240 days during the Covid pandemic. In cross-sectional analyses we discover stark patterns of price formation of risk. We articulate eighteen long-short trading strategies in the frequently traded, and related, REIT sector to exploit these aberrations. 84% of our risk signaled automated trading strategies produced significant alphas, with 75% of those generating strong positive abnormal returns. This is the first paper in the literature to estimate risk decompositions for commercial real estate securities at intraday frequencies.

### **Synthetic cap rates (1991-Covid era). 2022, Under review.**

We introduce a method that combines Euclidean distancing and OLS techniques to project synthetic capitalization rate indices ('SCXs') for metropolitan statistical areas in the US. SCXs are projected independently of market prices, asset specific characteristics and geographic location (ex-ante). In contrast to market cap rates, driven by geographic proximity and market comparables, our new method is driven by economic proximity. We find SCXs provide better forward guidance than market cap rates for commercial real estate ('CRE') defaults and CRE values before and during the Covid pandemic. Our method establishes benchmark indices that explicitly connect CRE valuation to the macroeconomy.