

# **WEIDONG TIAN**

Department of Finance

Belk College of Business

University of North Carolina at Charlotte

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## **CURRENT ACADEMIC POSITIONS:**

Professor of Finance, 2012 -Present

Distinguished Professor in Risk Management and Insurance

University of North Carolina at Charlotte

## **ACADEMIC EXPERIENCE:**

Associate Professor of Finance, 2008 - 2012

Distinguished Scholar in Risk Management and Insurance

University of North Carolina at Charlotte

Associate Professor, 2003-2008

University of Waterloo, Canada

## **VISITING POSITIONS:**

Visiting Research Fellow, SAMSI, Sept 2019 - June 2020

Visiting Scholar, MIT Sloan School of Management, August 2010 - December 2010

Visiting Scholar, Shanghai Advanced Institute of Finance, China, May 2012 - August 2012

Visiting Scholar, Newton Institute of Mathematical Science, Cambridge University, England, May 2006

## **EDUCATION**

PhD, 1999, McGill University, Montreal, Canada

## **RESEARCH INTERESTS**

*Asset Pricing and Asset Allocation:* Financial Market with Frictions, Derivatives, Pension Finance and Data-Driving Strategies, Quantitative Finance

*Risk Management, Derivative Market: Model Risk, Systemic Risk, Credit Risk, Knightian Uncertainty in Finance*

*Data Science Applications in Asset Allocation and Derivative Market.*

## REFERRED JOURNAL PUBLICATIONS

1. “Limited Diversification, Portfolio Inertia, and Ambiguous Correlation,” **Journal of Economic Theory**, 2022, (with Julia Jiang, Jun Liu and Xudong Zeng).
2. “Optimal Investing after Retirement Under Risk Capacity Constraint,” **Annals of Finance**, 2021, (with Zimu Zhu).
3. “An Equilibrium-Based Measure of Systemic Risk,” **Journal of Risk and Financial Management**, 2021, (with Kateria Ivanov, James Schutle, and Kevin Tseng).
4. “A Generalized Stochastic Differential Utility Driven by G-Brownian Motion,” **Mathematics and Financial Economics**, 2020, (with Qian Lin and Dejian Tian).
5. “Dynamic Asset Allocation with Skewness Preference,” **Quantitative Finance**, 2019, (with Jianqiang Yang and Congming Mu).
6. “A Consistent Investment Strategy,” **Journal of Investment Strategy**, 2019, (with George Chen).
7. “Semi-Nonparametric Approximation and Index Options,” **Annals of Finance**, 2018, (with Julia Jiang).
8. “The Financial Market: Not as Big as You Think,” **Mathematics and Financial Economics**, 2018.
9. “Callable Contingent Capital: Valuation and Default Risk”, **Management Science**, 64 (1), 112-120, 2018.
10. “Model Uncertainty Effects on Asset Prices,” **International Review of Finance**, 17 (2), 205-233, 2017, (with Junya Jiang).
11. “Comparative Statistics under  $\kappa$ -Knightian Ambiguity for Log-Brownian Asset Prices,” **International Journal of Economic Theory**, 12 (4), 361-378, 2016, (with Dejian Tian),.
12. “Optimal Risk-Sharing under Sharing Mutual Singular Beliefs, ” **Mathematical of Social Science**, 2014, (with Dejian Tian).

13. "Equilibrium Analysis of one Aggressive Investment Strategy," **Journal of Financial Engineering**, 1 (4), 2014, (with Junya Jiang),.
14. "Spanning with Indexes", **Journal of Mathematical Economics**, 53, 111-118, 2014.
15. "Contingent Capital As An Asset Class," **Journal of Investing**, 2014, Spring.
16. "A Welfare Analysis of Capital Insurance," **Risks**, 1(2), 57-80, 2013, (with Ekaterina Panttser).
17. "Optimal Portfolio Choice and Consistent Performance, " **Decisions in Economics and Finance**, 2013, (with Chen Xianzhe).
18. "Optimal Stopping with Reward Constraints," **Finance and Stochastics**, 16, 2012, 423-448, (with Jerome Detemple and Jie Xiong).
19. "Optimal Insurance Design under Ambiguity," **Decisions in Economics and Finance**, 36 (2), 2013, 99-124, (with Carole Bernard and Ji Shaolin).
20. "Stock and Option Proportions in Executive Compensation," **Quarterly Journal of Finance**, 1 (1), 2011, 169-203, (with Phelim Boyle, Ranjini Jha, and Shannon Kennedy).
21. "Insurance Market Effects of Risk Management Metrics, " **Geneva Risk and Insurance Review**, 35 (1), 2010, pp. 47 - 80, (with Carole Bernard).
22. "Optimal Reinsurance Arrangements Under Tail Risk Measure," **Journal of Risk and Insurance**, 76 (3), 2009, pp. 253 - 280, (with Carole Bernard).
23. "Optimal Design of Equity Linked Structured Products under Probability," **Scandinavian Actuarial Journal**, 4, 2009, October, pp. 253-280, (with Phelim Boyle).
24. "Robust Stochastic Discount Factors," **Review of Financial Studies**, 21 (3), 2008, pp. 1077 - 1122, (with Phelim Boyle, Shui Feng, and Tan Wang).
25. "The Design of Equity Indexed Annuities," **Insurance: Mathematics and Economics**, 43 (3), 2008, pp. 303 - 315, (with Phelim Boyle).
26. "Portfolio Management with Constraints," **Mathematical Finance**, 17 (3), 2007, pp. 319-343, (with Phelim Boyle).

27. "Constructing Default Boundaries," **Banque & Marches**, Jan-Feb, 2006, pp. 21-28, (with Houben Huang).
28. "Employee-Stock Option: A Firm Value Approach," **Journal of Derivative Accounting**, v2 (2), 2005, pp. 189-201, (with Phelim Boyle).
29. "The Valuation of American Call Options on the Minimum of Two Dividend-paying Assets," **Annals of Applied Probability**, 12 (3), 2003, pp. 953-983, (with Jerome Detemple and Feng Shui).
30. "The Valuation of American Option for a Class of Diffusion Process," **Management Science**, 48, 2002, pp. 917-937, (with Jerome Detemple),
31. "The Riccati Equation in Mathematical Finance," **Journal of Symbolic Computation**, 33, 2002, pp. 343-355, (with Phelim Boyle and Fred Guan).
32. "Calibrating the Black-Derman-Toy model: some theoretical results," **Applied Mathematical Finance**, 8, 2001, pp. 27-48, (with Phelim Boyle and Ken Seng Tan).
33. "Quadratic Interest Rate Models as Approximations to Effective Rate Models," **Journal of Fixed Income**, vol 9, December 1999, pp. 69-80, (with Phelim Boyle).

#### **REFERRED PUBLICATIONS: CHAPTERS IN BOOKS**

1. "The Bank Capital: an Insurance Perspective," **Challenges to Financial Stability - Perspective, Models and Policies**, ASERS Publishing Company, 2014, (with Ekaterina Panttser).
2. "Optimal Stopping Rules meet Ambiguity," **Real Options, Ambiguity, Risk and Insurance**, 2013, (with Chen Zhijing and Zhao Guoqing).
3. "Large Deviation Techniques and Finance Applications," **Handbook of Operation Research and Management Science**, Elsevier, 2006, (with Phelim Boyle and Feng Shui).

#### **BOOKS**

1. "Commercial Banking Risk Management: Regulation in the Wake of the 2008 Financial Crisis," **Palgrave Macmillan**, 2016; **China Finance Publication** (in Chinese Version), 2019.
2. "Systemic Risk and Reinsurance", **MDPI**, 2020.

## AWARDS AND GRANTS

- *Best Paper Award*, Momentum, Reversal and the Firm Fundamental Cycle, World Finance Association, 2019.
- *Belk Summer Grant* Belk College of Business, University of North Carolina at Charlotte. Project (principal investigator): *What is the Time Series Regression of the Stock Market Return*, 2021
- *Belk Summer Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (co-principal investigator): *Momentum, Reversal and the Firm Fundamental Cycle*, 2019.
- *Belk Summer Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (co-principal investigator): *Diversification Premium or Diversification Discount?*, 2019.
- *Dean's Scholar Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (co-principal investigator): *Dynamic Asset Prices under Heterogeneous Habit formation*, 2016.
- *Best Paper Award*, Callable Contingent Capital: Valuation and default Risk, University of North Carolina at Charlotte, 2016.
- *Belk Summer Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (co-principal investigator): *Asset Prices and Correlated Risk Uncertainty*, 2015.
- *Belk Summer Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (co-principal investigator): *The Role of Debt i Times of Financial Distress*, 2014.
- *Distinguished Scholar Award*, University of North Carolina at Charlotte, 2013.
- *Belk Summer Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (principal investigator): *A Welfare Analysis of Capital Insurance*, 2012.
- *Distinguished Professor in Risk Management and Insurance*, University of North Carolina at Charlotte, 2012- present.

- *Distinguished Scholar in Risk Management and Insurance*, University of North Carolina at Charlotte, 2008 - 2012.
- *Dean's Scholar Grant*, Belk College of Business, University of North Carolina at Charlotte. Project (principal investigator): *Contingent Capital Bonds with Endogenous Trigger Safety Covenants*, 2011.
- Research Grant of Tata Consultancy Services (principal investigator): *Derivatives Hedging Strategy under Model Uncertainty*, 2007 - 2008.
- Research Grant of TD Security Research Project Fund (principal investigator): *Asset Allocation Implication of High Frequency Financial Data*, 2007 - 2009.
- Research Grant of IQFI, University of Waterloo (principal investigator): *Corporate Securities Valuation and Hedging of Structured Notes*, September 2006 - April 2008.
- Research Grant of the Natural Science and Engineering Research Council of Canada (principal investigator): *Problems in Mathematical Finance*, April 2007- March 2011.
- Canada Foundation for Innovation: *Providing Research Infrastructure for Mathematical Excellence*, 2005-2010.
- Research Grant of the Natural Science and Engineering Research Council of Canada (principal investigator): *Probability Models in Continuous-Time Finance*, April 2004 - March 2007.
- Start up Research Grant of University of Waterloo, 2003-2004.

## COURSES TAUGHT

*University of North Carolina at Charlotte*

- Financial Economic Theory (PhD)
- Advanced Asset Pricing (Continuous-time) (PhD)
- Advanced Risk Management (PhD)
- Financial Economic Theory (Graduate)
- Quantitative Risk Management (Graduate)
- Financial Econometrics (Graduate)

- Derivative (Graduate)
- Investment Management (MBA)
- Financial Management (MBA)

*University of Waterloo*

- Asset and Liability Management
- Mathematical Models in Finance
- Continuous-Time Finance (Graduate)
- Fixed Income Modeling (Graduate)
- Corporate Finance
- Modeling and Management of Economical Capital (Professional course)

## **ACADEMIC ACTIVITIES**

Ad-Hoc Referee: Journal of Finance, Review of Financial Studies, Mathematical Finance, Management Science, Finance and Stochastics, Journal of Economic Dynamics and Control, Journal of Financial and Quantitative Analysis, Journal of Banking and Finance, Journal of Corporate Finance, Journal of Risk and Insurance, Journal of Derivatives, Journal of Derivative Accounting, International Journal of Theoretical and Applied Finance, Insurance: Mathematics and Economics, Economic Inquiry, Journal of Future Market, Decision in Economics and Finance, Financial Review, Financial Management, Geneva Risk and Insurance Review, Quantitative Finance, Applied Mathematical Finance, North American Actuarial Journal, SIAM Journal of Applied Probability, Mathematics and Financial Economics, Journal of Asset Management, Journal of Investing, International Review of Finance, European Financial Management, Risks, Research Grant Council of Canada (NSERC and SSHRC).

Member: American Finance Association, Western Finance Association, Financial Management Association, Midwest Finance Association, European Finance Association, American Risk and Insurance Association, Econometric Society, Bachelier Finance Society, Applied Probability Society of INFORMS.

Conference Organizer and Session Organizer: Financial Management Association Conference (2010-2016, 2018); Midwest Finance Association (2012-2016); Asian Financial Conference (2010-2018); Easter Finance Association (2015-2016); Model Risk

Conference (UNCC and International Review of Finance, 2016); Fixed Income Conference (USC - UNCC, 2015); International Symposium on Risk Management and Derivatives (UNCC and Xiamen University 2011, 2009); Distinguished PhD seminar advisor (EFMA, 2014).

## **Ph.D. DISSERTATION ADVISING**

*University of North Carolina at Charlotte*

Chair of PhD Dissertation Committees: *Minghao Cai (2012)*, *Geroge Chen (2016)*, *Katerina Ivanov (2016)*, *Julia Jiang (2018)*.

Members of PhD Dissertation Committees: *Xinde Zhang (2009)*, *Jun Chen (2013)*, *Yiyi Chen (2013)*, *Samuel Abamkwa (2014)*, *Xi Mo (2019)*.

*University of Waterloo*

Members of PhD Dissertation Committees: *Chantal Labbe (2005)*, *Diego Hernandez Rangel (2006)*, *Joonghee Hub (2007)*.

## **UNIVERSITY SERVICES**

- Program Director, Master Science of Mathematical Finance, University of North Carolina at Charlotte, 2012-2020.
- PhD Finance Program Committee, 2009 - 2017.
- MAFI Program Committee, 2009-2019.
- College Review Committee, 2014-2019.
- Department Review Committee, 2020 - 2022, 2011-2013.
- University representatives of PhD programs (ad hoc), more than 20 students
- University Industry Partnership Committee, 2017-2019.
- Finance Faculty Recruiting Committee (ad hoc): University of North Carolina at Charlotte, 2009-2018; University of Waterloo, 2004 - 2008

## **PRESENTATIONS/SEMINARS (A partial list)**

- “What is the Time Series Regression of the Stock Market Return?”, CICF 2021, WFC, 2021.



- “An On-line Machine Learning Return Prediction”, INFORM 2020, IRMC, 2020.
- “Dynamic Financial Decisions under Financial Risks”, Invited Talk on SAMSI Program in Games and Decisions in Risk and Reliability, Duke University, August 2019.
- “Momentum, Reversal and the Firm Fundamental Cycle”, SoFIE 2019, CICF 2019.
- “Optimal Consumption and Savings with Switching Preferences for Assets”, Seminar in University of Cattolica del Sacro Cuore 2019, CMTU 2019.
- “Correlation Uncertainty and Asset Pricing”, CICF 2016; SFS Cava;cade Finance Conference 2016; European Economics Conference, 2017; FMA 2017.
- “Asymmetric Effect of Information Transfer Uncertainty”, European Economics Conference, 2017; FMA 2017.
- “Spanning with Index”, European Economics Conference, 2014, World Finance Association Conference 2014.
- “Neural Network and Asset Finance”, Seminar in Ningbo University 2019, NC State University 2017.
- “Optimal Capital Insurance and Systemic Risk”, Shanghai Jiao Tong University (2016); CICF 2015; Midwest Finance Association Conference 2015; EFA 2014.
- “Contingent Capital”, Seminars at USC (2014), Xiamen University (2014), UNCC (2014), SAIF (2015).
- “Model Uncertainty Effects on Asset Prices”, Model Risk Conference (IRF-UNCC) 2016.
- “Financial Risk Management after Financial-Crisis”, Invited Keynote speaker on Chinese Young Economist Conference (Xiamen) 2015.
- “Time-inconsistent equilibrium”, Seminars at Xiamen University and CMTU 2015.
- “Dynamic Asset pricing under Heterogeneous Internal Habit Formation”, Seminars at UNCC (2016, 2017).
- “Comparative Statistics under Ambiguity”, SIAM Conference (2014).

- “Portfolio choice under consistent performance constraint”, Seminars at Beijing University, Zhong Shan University and Shan dong University (2014); Qinghua University (Taiwan) (2013).
- “Unhedgeable risk and Parameter Uncertainty in Commodity Market,” Third International Financial Risk and Corporate Finance Conference, Dalian, July 2011.
- “Asset Pricing under Model Uncertainty: Non-arbitrage Approach,” Workshop on Nonlinear Expectation and Applications in Financial Econometrics, Beijing, July 2011.
- “Correlation Uncertainty and Equilibrium Asset Prices,” Charlotte, SIAM-SEAS, March 2011; Third Annual Risk Management Conference, Singapore, July 2010.
- “Takeover, Agency Costs and Corporate Governance,” Dalian University of Technology Finance Seminar, July 2010.
- “Optimal Stopping Rule under Ambiguity in Continuous Time,” University of Waterloo, WatRISQ Finance Seminar, May 2010.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” The 2009 China International Conference in Finance, GuangZhou, July 2009.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” International Symposium on Risk Management and Derivatives, Xiamen, July 2009.
- “Takeover, Agency Costs and Corporate Governance,” Hong Kong University Finance Seminar, July 2009.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” SIF Capital Markets/Corporate Finance, Shanghai, July 2009.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” 2009 Michigan Mitsui Life Symposium, April 2009.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” International Financial Research Forum, Paris, March 2009.
- “Heterogeneous Beliefs, Imitation, and the Vulnerability of Financial Innovation,” University of North Carolina at Charlotte Finance Seminar, Feb 2009.

- “Information Uncertainty, Imitation, and the Survival of Financial Innovation,” 1st International Workshop on Model Uncertainty and Risk Control, July 2008.
- “Optimal Insurance Design When Insurer Implement Risk Management Metrics,” SSC/SFdS, Ottawa, May 2008.
- “Debt with Trigger Covenants, Default and Corporate Securities Valuation,” University of North Carolina at Charlotte, February 2008.
- “Debt with Trigger Covenants, Default and Corporate Securities Valuation,” Wilfrid University Finance Seminar, January 2008.
- “Debt with Trigger Covenants, Default and Corporate Securities Valuation,” North American Finance Association Conference, Toronto, November 2007.
- “Stock and Option Proportion in Executive Compensation,” North American Finance Association Conference, Toronto, November 2007.
- “Optimal Insurance Design When Insurer Implement Risk Management Metrics,” Academic Sinica Finance Seminar, Beijing, October 2007.
- “Optimal Insurance Design When Insurer Implement Risk Management Metrics,” Fudan University Finance and Insurance Seminar, Shanghai, October 2007.
- “Debt with Trigger Covenants, Default and Corporate Securities Valuation,” The 2007 China International Conference in Finance, Chengdou, July 2007.
- “Structured Products and Equity Indexed Annuities: the Quest for Optimality,” Festkolloquium in honour of Phelim Boyle, June 2006.
- “Default and Capital Structure with Linked Debt Securities,” Quantitative Finance Conference on Credit Risk, Fields Institute, November 2005.
- “Incomplete Model: Model Misphecations and Stochastic Discount Factors,” Research Center for Stochastic Seminar, Beijing Normal University, July 2005.
- “Default and Capital Structure with Linked Debt Securities,” Newton Institute for Mathematical Science, Cambridge, July 2005.
- “Predictions of Credit Risks in Structural Model,” 13th INFORMS Applied Probability Conference, Ottawa, July 2005.

- “Predictions of Credit Risks in Structural Model,” Workshop on Capital Structure Arbitrage, Evry University, June 2005.
- “Incomplete Model: Model Mispecications and Stochastic Discount Factors,” University of Western Ontario Research Seminar, April 2005.
- “Incomplete Model: Model Mispecications and Stochastic Discount Factors,” CRM-Montreal Seminar, November 2004.
- “Optimal Portfolio Managements: An Uniform Treatment,” Bachelier Finance Society Conference, Chicago, July 2004.
- “Incomplete Model: Model Mispecications and Stochastic Discount Factors,” Bachelier Finance Society Conference, Chicago, July 2004.
- “Optimal Portfolio Managements: An Uniform Treatment,” Risk Management and Insurance Conference, Waterloo, June 2004.
- “The Stock Options Debate in Executive Compensation,” University of Western Ontario Seminar, London, November 2003.
- “The Stock Options Debate in Executive Compensation,” York University Finance Seminar, November 2003.
- “New Closed Form Solutions for the Extended CIR Model,” 10th Annual Derivatives Securities Conference, Boston, April 2000.

#### **CONFERENCE DISCUSSANT/REVIEWER (A partial list)**

##### *Conference Reviewer*

- Financial Management Association Conference, 2018 - 2011.
- Midwest Finance Association Conference, 2011 - 2017.
- Asian Finance Association Conference, 2012 - 2018.
- Eastern Finance Association Conference, 2014 - 2016.
- European Economics Association, 2015.
- European Financial Management Conference, 2016.
- Model Risk Conference (UNCC - IRF), 2016.
- Fixed Income Conference (UNCC - USC), 2015.

- China International Conference in Finance, 2009-2011, 2016-2018
- Third Annual Risk Management Conference, Singapore, July 2010.
- Western Finance Association, Victoria, June 2010.
- International Symposium on Risk Management and Derivatives, Xiamen, 2009, 2011.
- 1'st International Workshop on Model Uncertainty and Risk Control, Qingdao, July 2008.
- North American Finance Association Conference, Toronto, 2017-2019, 2006-2007.

### **Conference Discussant**

- China International Conference in Finance, 2019, 2018, 2016, 2012.
- Financial Management Association Conference, 2017, 2015.
- Midwest Finance Association, 2013, 2014.
- Asian Finance Conference, 2018.
- European Economics Conference, 2015, 2017.
- European Financial Management, 2016.
- Eastern Finance Association, Savannah, April 2011.
- SIF Capital Markets/Corporate Finance, Shanghai, July 2010.
- Third Annual Risk Management Conference, Singapore, July 2010.
- 6th Bachelier Finance Society Conference, Toronto, June 2010.
- International Symposium on Risk Management and Derivatives, Xiaman, July 2009; July 2011
- The 2008 China International Conference in Finance, Guangzhong, July 2009.
- SIF Capital Markets/Corporate Finance, Shanghai, July 2009.
- 2008 China International Conference in Finance, Dalian, July 2008.
- 1st International Workshop on Model Uncertainty and Risk Control, Qingdao, July 2008.
- 2007 China International Conference in Finance, Chengdu, July 2007.
- North American Finance Association Conference, Toronto, November 2006; November 2007.

## PROFESSIONAL/CONSULTING EXPERIENCES

*Algorithmics Inc - IBM; William Trading Company; Enron Corp; Reliant Resource Energy; TD Securities; Royal Bank of Canada; Bank of Montreal; Manulife; TIAA-Cref Investment.*