

Stuart M. Turnbull

Professional Experience

- 2003–August 2017** **Bauer Chaired Professor**
Bauer College of Business, University of Houston
- September 2017** **Professor Emeritus**
- 2002–July, 2003** **Lehman Brothers, New York**
Senior Vice President, Fixed Income Research
- Counterparty risk modeling.
 - Pricing CDS tranches
 - Forward default premiums
 - Risk modeling
- 1997–April, 2002** **Canadian Imperial Bank of Commerce, Toronto ON**
Vice President, Risk Management Division
- Designing methodologies to measure economic capital.
 - Designing new corporate performance metric.
 - New paradigms for transfer pricing corporate loan between origination and portfolio functions.
 - Applied the Jarrow-Turnbull reduced form pricing methodology for credit derivatives, loan pricing and other traded instruments, including revolvers.
 - Applied the J-T methodology in risk management for portfolios containing many obligors/facilities.
 - Helped develop model for pricing distressed debt.
- 1990-1997** **Queen’s University**
Professor, School of Business and Department of Economics
Bank of Montreal Chair of Banking and Finance
- 1976–1989** **University of Toronto**
Professor, Department of Economics. Cross appointed to the Faculty of Management. 1985-89.

Education

University of British Columbia
Ph.D. (Financial Economics)

Thesis: The Capital Asset Pricing Model and the Probability of Bankruptcy- Theory and Empirical Tests

Imperial College of Science and Technology (U. K.)
B.Sc. (Honors) in Physics, (ARCS) Associate, Royal College of Science

M.Sc. in Statistics and Operational Research, (DIC) Diploma of Imperial College

Computer Skills

R, C++, MatLab, Pascal, Basic, Fortran, Word, Power Point, Excel, Word Perfect.

Professional and Academic Affiliations

Associate Editorships:

- 1 **Journal of Finance** (1980 – March 1983);
- 2 **Mathematical Finance** (1989-December 2014);
- 3 **Journal of Financial Engineering**, (1994-1999);
- 4 **International Journal of Theoretical and Applied Finance** (1998-present);
- 5 **Journal of Derivatives** (1999-2018);
- 6 **Journal of Credit Risk** (2004-present).

Editor:

- 1 **Journal of Credit Risk** (2006-2007).
- 2 Series Editor (with Donald van Deventer), **Finance Focus Series**, John Wiley & Sons (Asia) (2005 – 2007).

Advisory Board

International Review of Applied Financial Issues and Economics (July 2010, present).

International Review of Banking and Financial Studies, (May, 2013, present), Sage/Elsevier Publications.

Journal of Risk and Financial Management (JRFM; ISSN 1911-8074); <http://www.mdpi.com/journal/jrfm/editors> (November 2018- present).

Fields Institute

Individual Member, The Centre for Financial Industries, the Fields Institute, March 2, 2018 (<http://www.fields.utoronto.ca/centres/centre-financial-industries>)

Referee for the Austrian Translational Research Project, 2006-2007.

Co-chairperson: Derivatives Securities Conference (1991-2013)

Member: Institute for Policy Analysis, University of Toronto (1985-2008)

National Association of Securities Dealers, Series 7 and 63 examinations. (September, 2002).

Additional ad hoc refereeing

Asia Pacific Management Review

Journal of Financial Services Research\

European Journal of Finance

Personal

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Publications

Financial Economics

1. S.M. Turnbull, 1977, "A Note on Discounting the Components of an Income Stream: Comment," **Journal of Finance**, 32, 221-223.
2. S.C. Myers and S.M. Turnbull, 1977, "Capital Budgeting and the Capital Asset Pricing Model: Good News and Bad News," **Journal of Finance**, 32, 321-333.

Reprinted in Financial Analysis and Planning Theory and Application, Editor, Cheng F. Lee (1983), 267-279, (Addison-Wesley).
3. S.M. Turnbull, 1977, "Market Value and Systematic Risk," **Journal of Finance**, 32, 1125-1142.
4. S.M. Turnbull, 1977, "Market Imperfections and the Capital Asset Pricing Model," **Journal of Business Finance and Accounting** (Britain), 4, 327-337.
5. S.M. Turnbull, 1979, "Debt Capacity," **Journal of Finance**, 34, 931-940.
6. L.G. Epstein and S.M. Turnbull, 1980, "Capital Asset Prices and the Temporal Resolution of Uncertainty," **Journal of Finance**, 35, 627-643.
7. S.M. Turnbull, 1980, "Measurement of the Real Rate of Interest and Related Problems in a World of Uncertainty," **Journal of Money, Credit and Banking**, 13, 177-191.
8. S.M. Turnbull and R. Winter, 1982, "An Alternative Test of the Capital Asset Pricing Model: Comment," **American Economic Review**, 72, 1194-1195.
9. S.M. Turnbull, 1983, "Additional Aspects of Rational Insurance Purchasing," **Journal of Business**, 56, 217-229.
10. S.M. Turnbull, 1983, "An Empirical Analysis of the Pricing of Mortgaged Backed Securities: Comment," **Journal of Finance**, 38, 646-647.
11. J. Carr and S.M. Turnbull, "Discount Brokerage and the Role of Financial Institutions," **Canadian Banker** (February, 1984), 18-23.
12. J. Carr and S.M. Turnbull, "Regulations of Canadian Financial Institutions and Some Comments on the Federal Green Paper," **Canadian Banker**, 95, 2 (October, 1985), 12-15.
13. J. E. Pesando and S.M. Turnbull, "Mortgage Rate Insurance and the Canadian Mortgage Market: Some Further Reflections," **Canadian Public Policy** (March, 1985), 115-117.
14. J. E. Pesando and S.M. Turnbull, "The Time Path of Homeowner's Equity Under Different Mortgage Instruments: A Simulation Study," **Federal Housing Review**, 4, 1 (January, 1985), 483-504.
15. V. Aivazian and S. M. Turnbull, "Taxation and Capital Structure: A Selected Review," Conference Proceedings, John Deutsch Institute (1988).

16. P. Kumar and S. Turnbull, "Optimal Patenting and Licensing of Financial Innovations" **Management Science**, (December 2008), 54, 2012 – 2023.
17. Crouhy, M. G., R. A. Jarrow and S. M. Turnbull, "Insights and Analysis of Current Events: The Subprime Credit Crisis of 2007", **Journal of Derivatives**, 16, 1 (Fall 2008), 81-110.

This paper made the SSRN TopTen List for Fen Partners in Publishing Journals(December 24, 2008, February 28, 2009) and also for Monetary Economics (November 20, 2009). The number of downloads was 6,605.

A shorter version of this paper titled "Causes of the Subprime Credit Crisis of '07 and Remedies" is published in the Fink Center Bulletin (2008), No. II, UCLA Anderson School of Management.
18. C. Stefanescu, R. Tunaru and S. Turnbull, "The Credit Rating Process and Estimation of Transition Probabilities: A Bayesian Approach", **Journal of Empirical Finance**, 16 (2009), 216-234.
19. S. M. Turnbull, "Measuring and Managing Risk in Innovative Financial Instruments", **Journal of Credit Risk**, 5, 2, (Summer 2009), 83-110. An abridge version of this paper is published in *Journal of Regulation & Risk*, published by the Institute of Regulation & Risk – North Asia. Re-printed in *Lessons from the Credit Crisis*, ed. A. Berd, Risk Books, 2010.
20. S. Chava, C. Stefanescu and S. M. Turnbull, "Modeling Expected Loss" **Management Science**, 57, 7 (July 2011), 1267-1287.
21. H. Doshi, J. Ericsson, K. Jacobs and S. M. Turnbull, "Pricing Credit Default Swaps with Observable Covariates", **Review of Financial Studies**, 26, 7 (August 2013), 2048-2094. Awarded the best paper in conference by the Institut de Finance Mathematique de Montreal, April 2012.
22. S. M. Turnbull, "Primary Firm Driven Portfolio Loss", *Journal of Credit Risk*, 13, 2, (June 2017), 33-52.

Law and Economics

23. P. Halpern, M. Trebilcock and S.M. Turnbull, 1980, "An Economic Analysis of Limited Liability in Corporation Law," **University of Toronto Law Journal**, 30, 117-150.

Reprinted in Corporate Law Anthology, Editor F. A. Gevurtz, Anderson Publishing Company, Cincinnati (1997).
24. P. Halpern and S.M. Turnbull, 1982, "**An Economic Analysis of Legal Contracts**," Lawyers and the Consumer Interest, Editors M. Trebilcock and R. Evans, (Butterworth).
25. P. Halpern and S. M. Turnbull, 1983, "Legal Fees Contracts and Alternative Cost Rules: An Economic Analysis," **International Review of Law and Economics**, 3, 3-26.

26. J. Carr, A. Milne, and S. M. Turnbull, "Greenline Investors Service: Shall We Keep Brokers and Banks Apart," **The Canadian Business Law Journal**, 8, 3 (December, 1983), 257-271.
27. S. M. Turnbull, "The Corporate Opportunity Doctrine: An Economic Analysis," **Canada-United States Law Journal**, 13, (1988).

Derivatives

28. P.J. Halpern and S.M. Turnbull, "Empirical Tests of Boundary Conditions for Toronto Stock Exchange Options," **Journal of Finance**, 40, 2 (June, 1985), 481-500.
29. S. M. Turnbull, "Swaps: A Zero Sum Game?", **Financial Management** (March, 1987), 16, 15-21.
30. _____ "Swaps: A Zero Sum Game: Reply to Marthinsen", (Summer 1989).
31. P.P. Boyle and S.M. Turnbull, "Pricing and Hedging Capped Options," **Journal of Futures Markets**, 9, 1 (1989), 41-54.

Reprinted in Handbook of Financial Engineering, Editors C. W. Smith and C. Smithson, Harper Collins Publishers, 1990.
32. A. Melino and S. M. Turnbull, "The Pricing of Foreign Currency Options with Stochastic Volatility," **Journal of Econometrics**, 45, No.1/2 (July/August 1990), 239-265.
Reprinted, Stochastic Volatility: Selected Readings, Editor N. Shepherd, Oxford University Press (2005).
33. A. Melino and S. M. Turnbull, "The Pricing of Foreign Currency Options," **Canadian Journal of Economics**, 24 (May 1991), 251-281.
34. S. M. Turnbull and F. Milne, "A Simple Approach to the Pricing of Interest Rate Options", **Review of Financial Studies**, 4, 1 (1991), 87-120.
35. S.M. Turnbull and L.M. Wakeman, "A Quick Algorithm for Pricing Average Options", **Journal of Financial and Quantitative Analysis**, 26, 3 (September 1991), 377-389.
Reprinted in Advanced Topics In Risk Management, Editors R. J. Schwartz and C. W. Smith, Prentice Hall(1993).
36. E. Levy and S.M. Turnbull, "Average Intelligence, **Risk**, Vol. 5, No.2 (February 1992), 53-59.
Reprinted in
1 From Black-Scholes to Black Holes, **Risk Magazine Ltd.**, London, U.K., 1992;
2 Monte Carlo, Editor B. Dupire, **Risk Magazine Ltd.**, London, U.K., 1998.
37. S. M. Turnbull, "This Year's Model", **Futures and Options World**, Issue 259, (December 1992).
38. S. M. Turnbull, "The Price Is Right", **Risk**, 5, 4 (April, 1992).
Reprinted in Over the Rainbow, **Risk Magazine Ltd.**, London 1996.

39. M. Musiela, S. M. Turnbull and L.M. Wakeman, "Interest Rate Risk Management", **Review of Futures Markets**, 12, 1 (1993), 221-261.
40. S. M. Turnbull, " Pricing and Hedging Diff Swaps", **Journal of Financial Engineering**, 2, 4 (December 1993), 297-333.
41. R. A. Jarrow and S. M. Turnbull, "Delta, Gamma and Bucket Hedging of Interest Rate Derivatives", **Applied Mathematical Finance**, 1, 1 (September, 1994).

Reprinted in

- 1 (Russian) Journal of Industrial Mathematics (approximate translation) (1995), 720-751,
 - 2 Interest Rate Risk Measurement and Management, (1999) editors S. Nawalkha and D. Chambers, Institutional Investors Inc. New York.
42. A. Melino and S. M. Turnbull, "Misspecification and the Pricing and Hedging of Long Term Foreign Currency Options", **Journal of International Money and Finance**, 14, 3 (1995), 373-393.
43. S. M. Turnbull, "Interest Rate Digital Options", **Journal of Derivatives**, (Fall, 1995), 92-101.

Credit Derivatives

44. R. A. Jarrow and S. M. Turnbull, " Drawing the Analogy", **Risk**, 5 (October, 1992), 63-70.
Reprinted in Derivative Credit Risk: Advances in Measurement and Management, **Risk Magazine Ltd.**, London 1995.
45. R. A. Jarrow and S. M. Turnbull, "The Pricing Derivatives on Financial Securities Subject to Credit Risk", **Journal of Finance**, 50, 1 (March 1995), 53-85.
- Reprinted in
1. Credit Risk Models and Management , edited D. Shimko, Risk Books, 1999;
 2. The International Library of Critical Writings In Financial Economic, editors G. M. Constantinides and A. G. Malliaris, Edward Elgar Publishing Ltd (2000).
46. R. A. Jarrow, D. Lando and S.M. Turnbull, "A Markov Model for the Term Structure of Credit Risk Spreads", **Review of Financial Studies**, 10, 2 (Summer 1997),481-523.
47. R. A. Jarrow, and S. M. Turnbull, "An Integrated Approach to Hedging and Pricing Eurodollar Derivative," **Journal of Risk and Insurance**, 64, 2 (1997), 271-299.
48. R. A. Jarrow and S. M. Turnbull, " When Swaps Are Dropped", **Risk**, 10, 5 (May,1997), 70-75.
49. R. A. Jarrow, and S.M. Turnbull, "A Unified Approach for Pricing Contingent Claims on Multiple Term Structures", **Review of Quantitative Finance and Accounting**, 10, (1998) 5-19.
50. R. A. Jarrow, and S. M. Turnbull, "The Intersection of Credit and Market Risk ", **Journal of Banking and Finance** (2000), 24, 271-299.

51. L. Hughston and S. M. Turnbull, "Credit Derivatives Made Simple", **Risk**, 13, 10 (October, 2000), S36-S43.
52. L. P. Hughston and S. M. Turnbull, "Credit Risk: Constructing the Basic Building Block," **Economic Notes**, (2001), 30, 2, 257-279.
53. S. M. Turnbull, "Pricing Loans Using Default Probabilities," **Economic Notes**, (2003), 32, 2, 197-217.
54. D. O'Kane and S. M. Turnbull, "Valuation of Credit Default Swaps", **Quantitative Credit Research Quarterly**, (April, 2003), Lehman Brothers, 28-44.
55. D. O'Kane C. Pedersen and S. M. Turnbull, "Valuing the Restructuring Clause In Credit Default Swaps", **Quantitative Credit Research Quarterly**, (April, 2003), Lehman Brothers, 45-59.
56. S. M. Turnbull, "Unresolved Issues in Modeling Credit Risky Assets," **Journal of Fixed Income**, (June, 2005), 15, 1, 68-87.
57. S. M. Turnbull, "The Pricing Implications of Counterparty Risk for Non-Linear Credit Products", **Journal of Credit Risk**, (Winter, 2005), 1, 4, 3-30.

Reprinted in Counterparty Credit Risk Modeling and Management , edited M. Pykhtin, Risk Books, 2006.

58. S. M. Turnbull, "Counterparty Risk: A Review", **Annual Review of Financial Economics**, (2014), 6, 241-259.
59. Choi, Yong Seok and Doshi, Hitesh and Jacobs, Kris and Turnbull, Stuart M., Pricing Structured Products with Economic Covariates (January 7, 2019). Available at SSRN: <https://ssrn.com/abstract=2705559> or <http://dx.doi.org/10.2139/ssrn.2705559> Forthcoming, Journal of Financial Economics.

Economic Capital

60. M. Crouhy, S. M. Turnbull, and L. Wakeman, "Measuring Risk Adjusted Performance," 1999, **Journal of Risk**, 2, 1, 5-35.
61. S. M. Turnbull, "Capital Allocation and Risk Performance Measurement in a Financial Institution", **Financial Markets, Institutions & Instruments**, NYU, (2000), 9, 5, 325-357.
62. S. M. Turnbull, "Bank and Business Performance Measurement", **Economic Notes**, (2002), 31, 2, 215-236.

63. S. M. Turnbull, "Measuring the Performance of a Business within a Bank: Risk Adjusted Rate of Return on Capital", ed. Michael Ong, *Managing and Measuring Capital*, Risk Books, 2012, ISBN 978-1-906348-45-8.

Recent Publications

1. Choi, Yong Seok and Doshi, Hitesh and Jacobs, Kris and Turnbull, Stuart M., Pricing Structured Products with Economic Covariates (January 7, 2019). Available at SSRN: <https://ssrn.com/abstract=2705559> or <http://dx.doi.org/10.2139/ssrn.2705559>
2. S. M. Turnbull, "Primary Firm Driven Portfolio Loss", *Journal of Credit Risk*, 13, 2, (June 2017), 33-52.
3. S. M. Turnbull, "Counterparty Risk: A Review", *Annual Review of Financial Economics*, (2014), 6, 241-259.
4. H. Doshi, J. Ericsson, K. Jacobs and S. M. Turnbull, "Pricing Credit Default Swaps with Observable Covariates", **Review of Financial Studies**, 26, 7 (August 2013), 2048-2094.
5. S. M. Turnbull, "Measuring the Performance of a Business within a Bank: Risk Adjusted Rate of Return on Capital", ed. Michael Ong, *Managing and Measuring Capital*, Risk Books, 2012, ISBN 978-1-906348-45-8, (467-502).
6. C. Chava, C. Stefanescu and S. M. Turnbull, "Modeling Expected Loss" **Management Science**, 57, 7 (July 2011), 1267-1287.

Books

S. M. Turnbull, Option Valuation, **Holt, Rinehart and Winston** (1987), ISBN 0-03-921820-1. Review by: Gordon J. Alexander, *The Journal of Finance*, Vol. 44, No. 1 (Mar., 1989), pp. 224-226

R. A. Jarrow and S. M. Turnbull, Derivative Securities, **South-Western Publishing Company** (1996), ISBN 0-538-84255-5. Second edition (2000).

Chapters in Books

- S. M. Turnbull, "Pricing Interest Rate Derivatives", **The Canadian Investment Banking Review**, McGraw-Hill (1992).
- R. A. Jarrow and S. M. Turnbull, "Credit Risk", **Handbook of Risk Management and Analysis**, ed. Carol Alexander, John Wiley Publishing Company (1996).
- S. M. Turnbull, Risk Adjusted Return on Capital (RAROC), **Encyclopedia of Quantitative Finance**, Wiley & Sons, West Sussex, U.K. (2009).
- S. M. Turnbull, "Measuring the Performance of a Business within a Bank: Risk Adjusted Rate of Return on Capital", ed. Michael Ong, **Managing and Measuring Capital**, Risk Books, 2012, ISBN 978-1-906348-45-8.

Book Reviews

S. M. Turnbull, Financial Calculus: An Introduction to Derivative Pricing, **The Short Book Review**, International Statistical Institute, 17, 2, August 1997, 31.

S. M. Turnbull, Credit: A Complete Guide to Pricing, Hedging and Risk Management, **Risk Magazine**, December 2001, 97.

News Paper Articles

Letter to the Editor “Investors Value Accuracy Ahead of Stability”, Financial Times (London, U.K.) Thursday October 8, 2009, co-authored with Lee M. Wakeman.

Op-Ed article, “Why Markets Need “Naked” Credit Default Swaps”, Wall Street Journal, September 12, 2012, co-authored with Lee M. Wakeman.

Professional Publications

1. “Extracting Value from Stress Testing”, (with S. Talwar), Global Risk Institute, Toronto, 2018, <https://globalriskinstitute.org/publications/extracting-value-from-stress-testing/>
2. Capital Allocation in Decentralized Businesses, Journal of Risk and Financial Management, November 2018, <http://www.mdpi.com/1911-8074/11/4/82/htm>

Working Papers

1. Pricing Structured Products with Economic Covariates (with H. Doshi and K. Jacobs)

Work in Process

1. Impact of News on Oil Futures (with K. B. Ensor, Y. Han, B. Ostdiek)
2. Pricing commodity futures.

Courses Taught

Undergraduate, MBA, Ph. D and executive teaching.
Portfolio Theory
Investments
Fixed Income (MBA)
Financial Innovation (MF)
Options and Futures
Corporate Finance
Micro Economics
Financial Economics
Ph. D. Topics course
Ph. D. Asset Pricing