

Stuart M. Turnbull

Professional Experience

August, 2003–Present **Bauer Chaired Professor**
Bauer College of Business, University of Houston

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

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

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

Professional and Academic Affiliations

Associate Editorships:

- 1 **Mathematical Finance** (1989-present);
- 2 **Journal of Financial Engineering**, (1994-1999);
- 3 **International Journal of Theoretical and Applied Finance** (1998-present);
- 4 **Journal of Derivatives** (1999-present);
- 5 **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).

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

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

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

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. Stefanescu, C., 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. Turnbull, S. M. "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. Chava, S. C. Stefanescu and S. M. Turnbull, "Modeling Expected Loss" forthcoming **Management Science**.

Law and Economics

21. 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).
22. 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).
23. 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.
24. 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.
25. S.M. Turnbull, "The Corporate Opportunity Doctrine: An Economic Analysis," **Canada-United States Law Journal**, 13, (1988).

Derivatives

26. 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.
27. S.M. Turnbull, "Swaps: A Zero Sum Game?", **Financial Management** (March, 1987), 16, 15-21.
28. _____ "Swaps: A Zero Sum Game: Reply to Marthinsen", (Summer 1989).
29. 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.
30. 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. Shephard, Oxford University Press (2005).
31. A. Melino and S.M. Turnbull, "The Pricing of Foreign Currency Options," **Canadian Journal of Economics**, 24 (May 1991), 251-281.
32. 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.
33. 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).
34. 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.
35. S. M. Turnbull, "This Year's Model", **Futures and Options World**, Issue 259, (December 1992).
36. S. M. Turnbull, "The Price Is Right", **Risk**, 5, 4 (April, 1992).
Reprinted in Over the Rainbow, **Risk Magazine Ltd.**, London 1996.
37. M. Musiela, S.M. Turnbull and L.M. Wakeman, "Interest Rate Risk Management", **Review of Futures Markets**, 12, 1 (1993), 221-261.
38. S. M. Turnbull, " Pricing and Hedging Diff Swaps", **Journal of Financial Engineering**, 2, 4 (December 1993), 297-333.
39. 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.
40. 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.
41. S. M. Turnbull, "Interest Rate Digital Options", **Journal of Derivatives**, (Fall, 1995), 92-101.

Credit Derivatives

42. 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.
43. R. A. Jarrow and S.M. Turnbull, "The Pricing and Hedging of Options 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).
44. 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.
45. 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.
46. R. A. Jarrow and S. M. Turnbull, " When Swaps Are Dropped", **Risk**, 10, 5 (May,1997), 70-75.
47. 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.
48. R. A. Jarrow, and S.M. Turnbull, "The Intersection of Credit and Market Risk ", **Journal of Banking and Finance** (2000), 24, 271-299.
49. L. Hughston and S. M. Turnbull, "Credit Derivatives Made Simple", **Risk**, 13, 10 (October, 2000), S36-S43.
50. Hughston, L. P. and S. M. Turnbull, "Credit Risk: Constructing the Basic Building Block," **Economic Notes**, (2001), 30, 2, 257-279.

51. Turnbull, S. M., "Pricing Loans Using Default Probabilities," **Economic Notes**, (2003), 32, 2, 197-217.
52. D. O'Kane and S. M. Turnbull, "Valuation of Credit Default Swaps", Quantitative Credit Research Quarterly, (April, 2003), Lehman Brothers, 28-44.
53. 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.
54. Turnbull, S. M., "Unresolved Issues in Modeling Credit Risky Assets," **Journal of Fixed Income**, (June, 2005), 15, 1, 68-87.
55. Turnbull, S. M. "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.

Economic Capital

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

Recent Publications

- Chava, S. C. Stefanescu and S. M. Turnbull, "Modeling Expected Loss" forthcoming **Management Science**.
- Turnbull, S. M. "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.
- P. Kumar and S. Turnbull "Optimal Patenting and Licensing of Financial Innovations" **Management Science**, 54, (December 2008), 2012 – 2023.
- Stefanescu, C., 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.
- 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.

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. This paper has been downloaded from the SSRN web site 6,605 times and was in the top ten downloads for approximately eighteen months (Turnbull, Stuart M., Crouhy, Michel and Jarrow, Robert A., The Subprime Credit Crisis of 07 (July 9, 2008). Available at SSRN: <http://ssrn.com/abstract=1112467>)

S. M. Turnbull, Risk Adjusted Return on Capital (RAROC), Encyclopedia of Quantitative Finance, (2009), Wiley & Sons, West Sussex, U.K.

Books

S. M. Turnbull, Option Valuation, **Holt, Rinehart and Winston** (1987), ISBN 0-03-921820-1.

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, forthcoming, Wiley & Sons, West Sussex, U.K. (2009).

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.

Working Papers

1. “Pricing Revolvers”

2. “On Pricing Credit Default Swaps with Observable Covariates” (with H. Doshi, J. Ericsson, and K. Jacobs)
4. “Measuring the Performance of a Business Within a Bank (RAROC)”
5. “A Quadratic Specification with Observable Covariates for Pricing Credit Risky Obligations.”

Working in Process

1. Towards a Simple Model of Default Dependence
2. Pricing Sovereign Credit Default Swaps
3. A Top Down Approach for Structural Products.
4. Rating transitions.

Recent Academic Presentations

1. “Modeling Expected Loss”, Rice University, January 30, 2006; BMBF Workshop on Credit Risk Management, Munich, February 27-March 4, 2006; Federal Reserve Board Washington, May 30, 2006; McGill University, September 15, 2006.
2. Discussant, “Measuring and Modeling Default Risk Correlation”, P. Christoffersen, J. Ericsson, K. Jacobs and X. Jin, Bank of Canada, Conference on Fixed Income Markets, September 12-13, 2008.
3. “The Subprime Credit Crisis of 07”, the FDIC-JFSR Annual Banking Conference: Issues in Securitization and Credit Risk Transfer, September 18, 2008. The 11th Bowles Symposium, College of Business, Georgia State University, February 12-13, 2009.
4. “Measuring and Managing Risk in Innovative Financial Instruments” the Federal Reserve Bank of Atlanta “Financial Innovation & Crises Conference”, May 11-13, 2009, Jekyll Island, Georgia. Workshop on Financial Derivatives and Risk Management, Fields Institute, Research in Mathematical Sciences, May 24-28, 2010.
5. “On Pricing Credit Default Swaps with Observable Covariates”, Rice University, April 12, 2010. The Office of the Comptroller of the Currency, Washington, DC, September 16, 2010.

Courses Taught

Undergraduate, MBA, Ph. D and executive teaching.

Portfolio Theory

Investments

Fixed Income

Options and Futures

Corporate Finance

Micro Economics

Financial Economics

Ph. D. Topics course

Ph. D. Asset Pricing