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EDUCATION

Stanford University	Finance*	1978-82	Ph.D.	1983
Technion (Israel)	Economics**	1976-78	M.Sc.	1978
Technion (Israel)	Economics/Management***	1972-76	B.Sc.	1976

* GSB Merit Fellowships, 1980-81, 1981-82
** Gutwirth Foundation Scholarship
*** Graduated with honors

EXPERIENCE

University of Texas at Austin	Professor of Finance	1996-present
Dartmouth College	Visiting Professor of Finance	Fall 2011
Fordham University	Visiting Professor of Finance	Fall 2011
University of Texas at Austin	Jack S. Josey Professor in Energy Studies	2000-2002
University of Texas at Austin	Associate Professor of Finance	1988-1996
European Business School	Permanent Visiting Professor of Finance	2001-2006
	Adjunct Professor of Finance	2006-2010
Helsinki School of Economics and Business Administration	Visiting Associate Professor of Finance	May 1991
University of Chicago	Visiting Assistant and Visiting Associate Professor of Finance	1987-88
University of California, Berkeley	Assistant Professor of Finance	1982-88
Morgan Stanley & Co.	Executive Director, Commodity Market Modeling	2010-2011
University of Texas at Austin	Director, Center for Energy Finance Education and Research	1998-2009
Merrill Lynch & Co.	Vice President, Trading Research Group	1991-93

DISSERTATION

"Utility-Based Valuation of Capital Assets," Stanford University, May 1983.

PUBLISHED ARTICLES

1. "The Substitution of Capital, Labor and Energy in the Israeli Economy" (with A. Melnik), *Resources and Energy,* 3 (November 1981), pp. 247-258.

2. "A Utility-Based Model of Common Stock Price Movements" (with R. Litzenberger), *Journal of Finance,* XLI:1(March 1986), pp. 67-92.

3. "Pricing Risk-Adjusted Deposit Insurance: An Option-Based Model" (with A. Verma), *Journal of Finance,* XL1:4 (September 1986), pp. 871-895.

4. "On the Rationality of Common Stock Return Volatility," *Financial Review,* Vol. 21, No. 4, November 1986, pp. 355-381.

5. "A New Linear Programming Approach to Bond Portfolio Management," *Journal of Financial and Quantitative Analysis,* Vol. 22, No. 4, December 1987, pp. 439-466.

6. "A Multi-Attribute Comparative Evaluation of Relative Risk for a Sample of Banks" (with A. Verma), *Journal of Banking and Finance,* Vol. 11, 1987, pp. 499-523.

7. "Non-Additive Preferences and the Marginal Propensity to Consume," *American Economic Review,* Vol. 78, No. 1, March 1988, pp. 216-223.

8. "Capital Adequacy Standards for a Sample of 43 Major Banks" (with A. Verma), *Journal of Banking and Finance,* Vol. 13, No. 1, 1989, pp. 21-29 (Also published in *Proceedings, Bank Structure and Competition,* Federal Reserve Bank of Chicago, May 1988).

9. "Inflation Futures and a Riskless Real Interest Rate" (with B. Flesaker), *Review of Futures Markets,* Vol. 7, No. 1, May 1988, pp. 36-67.

10. "The Box Spread Arbitrage Condition: Theory, Tests and Investment Strategies" (with A. Gerbarg Ronn), *Review of Financial Studies,* Issue I, Volume II, 1989 (Also published in the *Proceedings, Seminar on the Analysis of Security Prices,* Center for Research in Security Prices, November 1987).

11. "Arbitrage-Based Estimation of Non-Stationary Shifts in the Term Structure of Interest Rates" (with R. Bliss), *Journal of Finance,* Vol. 44, No. 3, July 1989, pp. 591-610 (Preliminary draft published in *Proceedings, Seminar on the Analysis of Security Prices,* Center for Research in Security Prices, May 1988).

12. "A Simple Time-Varying Binomial Model for the Valuation of Interest Rate-Contingent Claims" (with R. Sias) (previously entitled "The Valuation of Options on the Short-Term Interest Rate"), **Advances in Futures and Options Research,** Vol. 5, 1991, pp. 89-111.

13. "The Valuation of Options on Eurodollar Futures Contracts using Non-Stationary Arbitrage-Free Models" (with H. Han), *Journal of Fixed Income,* Vol. 1, No. 3, December 1991, pp. 60-73.

14. "The Pricing of FIREARMs ('Falling Interest Rate Adjustable Rate Mortgage')" (with B. Flesaker), *Journal of Real Estate Finance and Economics,* Vol. 6, pp. 251-275, May 1993.

15. "A Non-Stationary Trinomial Model for the Valuation of Options on Treasury Bond Futures Contracts" (with R. Bliss), *Journal of Futures Markets,* Vol. 14, No. 5, August 1994, pp. 597-617 (Published in monograph form as **A New Method for Valuing Treasury Bond Futures Options,** Association for Investment Management and Research, Financial Analysts Federation, 1992).

16. "A Characterization of the Daily and Intra-Day Behavior of Returns on Options" (with A. Sheikh), *Journal of Finance,* Vol. 94, No. 2, June 1994, pp. 557-580.

17. "Debt and Market Incompleteness" (with L. Senbet), *Journal of Banking and Finance,* Vol. 19, No. 6, 1995.

18. "An Empirical Estimate of the Prepayment Option Value in Fixed-Rate GNMA Mortgage-Backed Securities" (with P. Rubinstein and F.-S. Pan), *Journal of the American Real Estate and Urban Economics Association,* Spring 1995, Vol. 23, 1, pp. 1-20.

19. "The Valuation of Default Risk in Corporate Bonds and Interest Rate Swaps" (with S. Nielsen), **Advances in Futures and Options Research,** Volume 9, 1997, pp. 175-196.

20. "Callable U. S. Treasury Bonds: Optimal Calls, Anomalies, and Implied Volatilities" (with R. Bliss), *Journal of Business,* Vol. 71, No. 2, April 1998, pp. 211-252.

21. "On the Relationship between Expected Returns and Implied Volatility of Interest Rate-Dependent Securities" (with P. Wadhwa), *Journal of Portfolio Management,* Vol. 24, No. 3, Spring 1998, pp. 93-109.

22. "Analyzing the Risks Inherent in the Procter & Gamble – Bankers Trust Levered Swap Contract" (with C. Dincerler and J. Martin), **Advances in Financial Planning and Forecasting,** edited by Cheng-Few Lee, Elsevier Science, 2001, Vol. 10, pp. 243-256.

23. "Valuation of Commodity-Based 'Swing' Options" (with P. Jaillet and S. Tompaidis), *Management Science,* 2004 (Preliminary draft of part I published in *Energy & Power Risk Management,* Vol. 3, No. 3, June 1998, pp. 14-16 and part II in July 1998 issue, pp. 28-29).

24. "The Bias in Black-Scholes/Black Implied Volatility: An Analysis of Equity and Energy Markets" (with J. Doran), *Review of Derivatives Research,* Volume 8, Issue 3, 2005 (Publication year: 2006).

25. "Estimating the Commodity Market Price of Risk for Energy Prices" (with S. Kolos), *Energy Economics,* Vol. 30, Issue 2, March 2008, pp. 621-641.

26. "Computing the Market Price of Volatility Risk in the Energy Commodity Markets" (with J. Doran), Special Issue on Commodities, *Journal of Banking and Finance,* Vol. 32, Issue 12, Dec. 2008, pp. 2541-2552.

27. "The Impact of Large Changes in Asset Prices on Intra-Market Correlations in the Domestic and International Markets" (with A. Sayrak and S. Tompaidis), *Financial Review,* Vol. 44, Issue 3, Aug. 2009, pp. 405-436.

28. "A Simple Model for Time-Varying Expected Returns on the S&P 500 Index" (with J. Doran and R. Goldberg), *Journal of Investment Management,* Vol. 7, Number 2, 2nd Quarter 2009.

29. "Valuation of a Natural Gas Storage Facility" (with M. Kjaer), *Journal of Energy Markets,* Vol. 1, Number 4, Winter 2008/09.

30. "Intra-Day Risk Premia in European Electricity Forward Markets" (with J. Wimschulte), *Journal of Energy Markets,* Vol. 2, Number 4, Winter 2009/10.

31. "Pricing Credit-Rated Defaultable Coupon Bonds" (with R. Jagannathan and W. Chen), *International Review of Applied Financial Issues and Economics,* Vol. 3, No. 3, 2011, pp. 574-593.

32. "Quantifying and Explaining the New Issue Premium in the Post Glass-Steagall Corporate Bond Market" (with R. Goldberg), forthcoming, *Journal of Fixed Income,* 2013.

33. "Fine-Tuning a Corporate Hedging Portfolio — The Case of an Airline Company" (with M. Gerner), forthcoming, *Journal of Applied Corporate Finance,* 2013

BOOK EDITOR

Real Options and Energy Management: Using Options Methodology to Enhance Capital Budgeting Decisions, 2002, Risk Books, London

CHAPTERS IN BOOKS

1. "Testing the Causality of Policy Variables in Israel" (with U. Ben-Zion), in Nadav Halevy and Jacob Kop (eds.), **Studies in the Israel Economy,** Maurice Falk Institute for Economic Research in Israel, Jerusalem, 1977, pp. 149-61.

2. "Changes of Asset Composition and the Performance of Mutual Funds" (with U. Ben-Zion and D. Rotem), in Zvi Zussman and Moshe Felber (eds.), **Studies in the Israel Economy 1981,** Jerusalem, 1983, pp. 187-208.

3. "A Model for the Valuation of Callable Bonds," in Frank J. Fabozzi (ed.), Ch. 10, **Handbook of Fixed Income Options: Strategies, Pricing and Applications,** pp. 245-259, 1996.

4. "Options on Treasury Bond Futures Contracts" (with K. Toft), in Frank J. Fabozzi (ed.), Ch. 11, **Handbook of Fixed Income Options: Strategies, Pricing and Applications,** pp. 261-281, 1996.

5. "Tax Effects in U. S. Government Bond Markets" (with Y. Shin), in Frank J. Fabozzi (ed.), **Advances in Fixed-Income Valuation Modeling and Risk Management,** New Hope, PA., 1997, pp. 233-250.

6. "A Two-Factor Model for the Valuation of the T-Bond Futures Contract's Embedded Options" (with S. Nielsen), in Frank J. Fabozzi (ed.), **Advances in Fixed-Income Valuation Modeling and Risk Management,** New Hope, PA., 1997, pp. 135-152.

7. "Valuation of Oil Fields as Optimal Exercise of the Extraction Option," in Vincent J. Kaminski (ed.), **Managing Energy Price Risk** (3rd. Edition), Risk Books, London, 2004.

8. "Was Enron's Business Model Fundamentally Flawed?," in Michael Frenkel, Ulrich Hommel and Markus Rudolf (eds.), **Risk Management: Challenge and Opportunity** (2nd. edition), 2004.

PRACTITIONER PUBLICATIONS

1. "Vega-Hedging: An Antidote for Model Misspecification" (with C. Xuan), *The MFA Reporter,* 1996, and *Derivatives Week,* Aug. 18, 1997.

2. "Hedging Long-Dated Oil Futures Contracts: An Empirical Investigation" (with C. Xuan), *Energy & Power Risk Management,* Vol. 3, No. 2, May 1998, pp. 26-29).

3. "Modeling the Correlation Matrix of Natural Gas Futures Returns" (with M. Kjaer), *Energy Risk,* Nov. 2006, pp. 60 – 66.

4. "Modeling the Correlation Function in the Crude-Oil Futures Market," *Energy Risk,* 2009.

5. "The Correlation Functions in the Crude-Oil and Natural-Gas Futures Markets," forthcoming *Energy Risk,* 2013.

WORK IN PROGRESS

"Managing Long and Short Price-and-Quantity Exposure at the Corporate Level" (with S. Kolos), Working Paper, University of Texas at Austin, Dec. 2007

"Valuation of Credit Derivatives, and Credit Value-at-Risk, for the Energy Industry," Working Paper, University of Texas at Austin, April 2007

"The Valuation and Informational Content of Options on Crude-Oil Futures Contracts" (with F. Murphy), Working Paper, University of Texas at Austin, Dec. 2012

"Using Equity Options to Obtain Forward-Looking Equity Betas — with Application to the Commodity Markets," Working Paper, University of Texas at Austin, Aug. 2012

"Modeling Natgas Intra-Month Spot (Daily or 'Cash') Price Movements," Working Paper, University of Texas at Austin, July 2012

"Using Equity, Index and Commodity Options to Obtain Forward-Looking Betas and Conditional-CAPM Expected Crude-Oil Spot Prices," Working Paper, University of Texas at Austin, Aug. 2013

SEMINAR PRESENTATIONS (2003 –)

"On the Market Price of Volatility Risk":
– Federal Reserve Bank of Chicago, March 2003
– Southern Methodist University, April 2003
– Thirteenth Annual Derivatives Securities Conference, April 2003
– Financial Management Association Annual Meetings, October 2003
– Texas Christian University, October 2003
– Bachelier Finance Society Third World Congress, July 2004

"Was Enron's Business Model Fundamentally Flawed?" LBJ School of Public Affairs Conference on "Corporate Governance and Control Fraud," April 2003

"Desirable Attributes of a Successful Electricity Forward Market": Public Utility Commission of Texas Public Workshop on Forward Market Structure for the ERCOT Market, June 2003

"Estimating the Commodity Market Price of Risk for Energy Prices":
– Fourteenth Annual Derivatives Securities Conference, April 2004
– Bachelier Finance Society Third World Congress, July 2004
– European Business School, September 2005

"Managing Long and Short Price-and-Quantity Exposure at the Corporate Level": Cornell University, February 2005

"A Simple Model for Time-Varying Expected Returns on the S&P 500 Index":
– Sixteenth Annual Derivatives Securities Conference, April 2006
– Western Economic Association, July 2007
– University of Twente, October 2007
– Annual Symposium of the Financial Services Institute, St. John's University, September 2008

"Computing the Market Price of Volatility Risk in the Energy Commodity Markets": CfC Commodities 2007 Academic Conference, Birkeck College University of London, January 2007

"Valuation of Credit Derivatives, and Credit Value-at-Risk, for the Energy Industry":
– CEMAF/ISCTE – NOVA 12th Anniversary Finance Conference, ISCTE Business School, Lisbon, March 2007
– Third International Conference on Credit and Operational Risks, HEC Montréal, April 2007

"Energy Derivatives after ... Dec. 2, 2001": New York University Stern School of Business Conference "Derivatives 2007: New Ideas, New Instruments, New Markets," May 2007

"Fine-Tuning a Corporate Hedging Portfolio — The Case of an Airline Company":
– 22nd Annual Derivatives Securities and Risk Management Conference, March 2012
– Case Western Reserve University, April 2012
– Tulane University, Dec. 2012
– University of Alberta, Jan. 2013

"Intra-Day Risk Premia in European Electricity Forward Markets": Eighteenth Annual Derivatives Securities & Risk Management Conference, April 2008

"The Valuation and Informational Content of Options on Crude-Oil Futures Contracts":
– Vienna Graduate School of Finance, June 2009
– European Business School, June 2009
– Center for Advanced Research in Finance, Tokyo University, June 2009
– Madrid Finance Workshop, Oct. 2009
– Twentieth Financial Economics and Accounting Conference, Nov. 2009
– Centre de Recherche Mathématique, McGill University, March 2010
– Industrial-Academic Forum on Commodities, Energy Markets, and Emissions Trading, Fields Institute, April 2010
– University of Hong Kong, June 2011
– HEC Montréal, Oct. 2011
– Fordham University, Nov. 2011
– Norwegian University of Science and Technology, Oct. 2013

"Using Equity, Index and Commodity Options to Obtain Forward-Looking Betas and Conditional-CAPM Expected Crude-Oil Spot Prices":
– Global Derivatives USA, International Center for Business Information, Nov. 2012
– Financial Research Association, "Early Ideas" Session, Dec. 2012
– Nanyang Business School, March 2013
– Energy Economics and Finance Seminar, Norwegian University of Science and Technology, May 2013
– University of York, Dec. 2013

"Modeling Natgas Intra-Month Spot (Daily or 'Cash') Price Movements": Global Derivatives USA, International Center for Business Information, Nov. 2013

KEYNOTE ADDRESSES

"The Crude-Oil/NatGas Markets: The 'Message from Markets'":
– Fuqua School of Business MBA International Retreat, July 2006
– Invited keynote address to Canadian Applied and Industrial Mathematics Society — CAIMS * SCMAI 2007, May 2007
– Keynote Address, 51st Conference of the Euro Working Group on Commodities and Financial Modeling, May 2013 (as "The Current State of the Oil-Futures Markets: The 'Message from Markets'")

"Challenges in Energy Risk Management": Keynote Address, Texas Quantitative Finance Festival, Nov. 2010

AWARDS

1986 Earl F. Cheit Excellence in Teaching Award, University of California at Berkeley, San Francisco MBA Program. Award presented at 1986 Spring Banquet, San Francisco, April 1986.

1986 American Association of Individual Investor Award for Best Paper in Investments at June 1986 Western Finance Association Meetings: "A New Linear Programming Approach to Bond Portfolio Management." Award presented at 1986 Annual Meeting of the Western Finance Association, Colorado Springs, June 1986

1997 Texas Finance Symposium Best Paper Award: "Ex-Ante Inferences on Rates of Return to Capital Assets Implied in Their Market-Value Weights." Award presented at 1997 Symposium, Denton, TX, October 1997

European Business School Teaching Excellence Award (Winter Term 2001/02), Silver
European Business School Teaching Excellence Award (Summer 2002), Gold
European Business School Teaching Excellence Award (Summer 2006)

Selected by *Energy Risk* Magazine to "Energy Risk Hall of Fame," Nov. 2004

Annual Symposium of St. John's University Financial Services Institute Best Paper Award: "A Simple Model for Time-Varying Expected Returns on the S&P 500 Index." Award presented at 2008 Symposium, New York City, September 2008

GRANTS

"A New Linear Programming Approach to Bond Portfolio Management": Institute for Quantitative Research in Finance Grant, September 1985

"Arbitrage-Based Estimation of Non-Stationary Shifts in the Term Structure of Interest Rates":
– Institute for Quantitative Research in Finance Grant, May 1988
– Research Foundation of the Institute of Chartered Financial Analysts Grant, July 1988

"The Pricing of FIREARMs ('Falling Interest Rate Adjustable Rate Mortgage')": Prochnow Edu-

cational Foundation, February 1989

PROFESSIONAL SERVICE

Associate Editor, *Review of Quantitative Finance and Accounting,* 2001 –

Associate Editor, *Energy Economics,* 2001 –

Associate Editor, *Journal of Energy Markets,* 2007 –

Associate Editor, *International Journal of Theoretical and Applied Finance,* 2008 –

Associate Editor, *Journal of Financial Services Research,* 1999 – 2003

Associate Editor, *Journal of Portfolio Management,* 1996 – 2002

Member, Advisory Board, **Handbook of Quantitative Finance & Risk Management,** forthcoming 2009.

Director, Center for Energy Finance Education and Research (CEFER), McCombs School of Business, University of Texas at Austin, 1998 – 2009

Member, Program Committees, 1987 – 1993, 1995 and 2006 – 2014 Annual Meetings of the Western Finance Association.

Member, Program Committees, 1992, 1994, 1996, 2002, 2003, 2005, 2008 and 2009 Annual Meetings of the Financial Management Association.

Member, Program Committee, 10th Global Finance Conference 2003, European Business School

Member, Program Committee, 2002 Annual Meeting of the European Finance Association.

Member, Program Committee, 2007 – 2010 Annual Meetings of the European Financial Management Association.

Member, Program Committee, 2010 – 2011 FMA Asian Conference

Seminar Coordinator, 1989 Texas Finance Symposium

Co-Chair, 1999 Tenth Annual Conference on Financial Economics and Accounting.

Secretary-Treasurer, Research Consortium on Financial Economics and Accounting, 2001 –

12/13