

Rafael Mendoza-Arriaga

Industrial Engineering & Management Sciences
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Education

Ph.D. Industrial Engineering, *Northwestern University*, 2009 (Expected)
Major: Financial Engineering, *Minors*: Applied Probability, Partial Differential Equations
M.Sc. Industrial Engineering, *Northwestern University*, 2005
M.Sc. Financial Mathematics, *University of Toronto*, 2002
B.Sc. Engineering Physics, *ITESM, Mexico*, 1999
Graduated with Honors

Publications

Refereed journal publications (published)

- Burmeister, C., Mausser H. & Mendoza R. "Actively Managing Tracking Error." *Journal of Asset Management*, Vol.5 (2005), Iss.6, pp. 410-422.

Refereed journal publications (submitted)

- Mendoza, R., Carr P., & Linetsky V.. "Time Changes of Markov Processes in Credit-Equity Modeling." Submitted to *Mathematical Finance* (2nd revision submitted), 2007.
- Mendoza, R. & Linetsky V. "Equity Default Swaps under the Jump-to-Default Extended CEV Model." To be submitted to *Finance and Stochastics*, 2008.

Book Chapters

- Burmeister, C., Mausser H. & Mendoza R. "Techniques for Managing Tracking Error." Chp 12 in *Portfolio Analysis Advanced Topics in Performance Measurement, Risk and Attribution* (Ed. Timothy P. Ryan). Risk Books, 2006.

Working Papers

- Mendoza, R. & Linetsky V. "Correlated Defaults: a multivariate time change approach". *Northwestern University*, 2008.
- Forrest A., Kreinin A., Mendis J. & Mendoza R. "Credit Rating Calibration of the Individual Spread Curve." *Algorithmics Inc*, 2002.

Teaching Experience

Northwestern University, Evanston, Il.

- *Instructor (appointed)*
 - *Economics & Finance for Engineers*. Spring 2009
- *Teaching Assistant*
 - *Financial Engineering I (graduate level)*
 - *Introduction to Financial Engineering*.
 - *Organizational Behavior*.
 - *Economics & Finance for Engineers*.

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Financial Industry Experience

Citadel Investment Group L.L.C.

- **Quantitative Researcher,** Chicago, Il. Jun 2007- Aug 2007
Built a linear factor model of credit spreads for Citadel's Global Portfolio Construction team. The objective of this project was to identify the sources of systematic risk acting on bonds of different credit worthiness.

Algorithmics Inc.

- **Financial Engineer,** Boston, Ma. May - Aug 2005
Implemented an integrated risk management system for State Street Bank as part of a strategic partnership with Algorithmics Inc. that would expand their reporting services to funds and investment firms.
- **Financial Engineer,** Toronto, Ont. Aug 2002- Aug 2004
Built prototype models for performance attribution and tracking error contributions. These models form part of Algorithmics' software solutions.
Re-engineered Algorithmics' Distributed Computing solutions using performance analysis and optimal work balance to decrease the computation time by 75% in the generation of risk reports.
- **Quantitative Researcher,** Toronto, Ont. Jan - Apr 2002
Developed a calibration methodology for single name default probability curves. This methodology, obtains the term structure curves from stripped bonds and credit default swaps of names with similar credit worthiness. Applied this to obtain spread and default probability curves subject to no-arbitrage constraints for each credit group. Finally, single name curves were implied as linear combinations of the curves previously constructed via OLS for each individual bond and credit default swap at various maturities.
- **Financial Engineer (Valmer),** Mexico City, Mex. Oct 2000- Jul 2001
Modeled daily issued securities in the Mexican Market using Algorithmics' RiskWatch system. Developed an interest rate curve methodology applied to the Mexican Market. This methodology was based on the Nelson-Siegel term structure. Valmer is a JV of Algorithmics with BMV that offers risk and valuation reports for traded securities in Mexico.

Awards

- Terminal Year Fellowship, McCormick School of Engineering, Northwestern University, Chicago IL. 2008-09.
- Fellowship Minority MEAS Tuition Grant, IEMS Northwestern University, Chicago IL. Sept 2004-Aug 2005.
- Fellowship MMF Algorithmics Inc., University of Toronto, Toronto, Canada. Aug 2001-Jul 2002.

Invited Service

- Alumni Academic Review Committee, Mathematical Finance Program UofT 2004.
- Physics Engineering Society, ITESM 1999.

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Presentations

- INFORMS 2006. “Equity Default Swaps under the Jump-to-Default Extended CEV Model.” Pittsburgh, PA. 11/07/2006 (poster).
- 2007-2008 Mathematical Finance and Probability Seminars, *Rutgers University*. “Time Changed Markov Processes in United Credit-Equity Modeling.” Brunswick NJ. 02/01/2008.
- Seminario de Matemáticas, *ITAM*. “Time Changed Markov Processes in United Credit-Equity Modeling”. Mexico, DF. 05/09/2008.
- Bachelier Finance Congress 2008, *Imperial College*. “Time Changed Markov Processes in United Credit-Equity Modeling”. London UK, 07/15/2008.

Upcoming presentations

- INFORMS 2008. “Pricing EDS under the JDCEV Model”. Washington DC, 10/12/2008.
- INFORMS 2008. “Time Changed Markov Processes in United Credit-Equity Modeling”. Washington DC, 10/14/2008.
- SIAM Conference on Financial Mathematics and Engineering. New Brunswick NJ, 11/21/2008
- American Mathematical Society 2009. Financial Math. “Time Changed Markov Processes in United Credit-Equity Modeling”. Washington DC, 01/05/2009.
- “Eigenfunction expansion and Fourier-Laplace transform methods in Finance”, *University of Leicester*, Leicester UK, 06/18/2009

References

Vadim Linetsky (Dissertation Advisor)

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McCormick School of Engineering and Applied Science, Northwestern University
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John Birge

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Peter Carr

Head of Quantitative Financial Research, Bloomberg LP
Director, Masters in Mathematical Finance Program
Courant Institute of Mathematical Sciences, New York University
e-mail: pcarr@nyc.rr.com & PCarr4@bloomberg.com phone: (917) 369 5629

Dan Rosen

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Fields Institute for Research in Mathematical Sciences
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Jeremy Staum

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