CURRICULUM VITAE

Nuno Crato

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CURRENT APPOINTMENT

C.E.O. of Taguspark, S.A., Science and Technology Park, Oeiras, Portugal, on leave and appointed by the Technical University of Lisbon, ISEG.

EDUCATION

Aggregation (Habilitation), at the Lisbon Technical University, February 2002.

Ph.D. in Applied Mathematics at the Department of Mathematical Sciences of the University of Delaware (1992). Dissertation "On some misspecification problems in long-memory fractional time series models"; advisor Professor Howard M. Taylor.

M.S. (mestrado) in Mathematical Methods for Management Decisions, at the Technical University of Lisbon (1985). Thesis on Kalman filtering prediction.

B.S. (licenciatura) in Economics at the Technical University of Lisbon (1981).

SELECTED REFEREED PUBLICATIONS

Crato, N., Linhares, R.R., and Lopes, S.R.C. (2011) α-stable laws for noncoding regions in DNA sequences, *Journal of Applied Statistics* **38**, 261–271.

Diniz, A., Barreiros, J., and Crato, N. (2010). Parameterized estimation of long-range correlation and variance components in human serial interval production, *Motor Control* **14**, 26–43.

Crato, N., Linhares, R.R., and Lopes, S.R.C. (2010). Statistical properties of detrended fluctuation analysis, *Journal of Statistical Computation and Simulation* **80**, 6, 625–641.

Caiado, J. and Crato, N. (2010). Identifying common dynamic features in stock returns, *Quantitative Finance* **10**, 7, 797–807.

Caiado, J., Crato, N. and Pea, D. (2009). Comparison of time series with unequal length in the frequency domain, *Communications in Statistics: Simulation and Computation* **8**, 527–542.

Carvalho, A., Crato, N., and Gomes, C. (2009). "A Generative Power-Law Search Tree Model", *Computers & Operations Research* **36**, 2376–2386.

Caiado, J., Crato, N. and Peña, D. (2006). "A periodogram-based metric for time series classification", *Computational Statistics & Data Analysis* **50,** 10, 2668–2684.

Crato, N. (2005). "A mild skepticism on nonlinear forecasting: Some comments on the paper by Harvill and Ray", *International Journal of Forecasting* **21**–4, p. 729.

Borges, M.F., Santos, A.M.P., Crato, N., Mendes, H., and Mota, B. (2003) "Sardine regime shifts off Portugal: a time series analysis of catches and wind conditions", *Scientia Marina* **67**, Suppl. 1, 235–244.

Crato, N. and Ray, Bonnie K. "Semi-parametric smoothing estimators for long-memory processes with added noise", *Journal of Statistical Planning and Inference* **105**, 283–297, 2002.

Rammjee, R., Crato, N. and Ray, B.K. "A note on moving average forecasts of long memory processes with an application to quality control", *International Journal of Forecasting* **18**, 291–297, 2002.

Costa, A.A. and Crato, N. "Long-Run Versus Short-Run Behaviour of the Real Exchange Rates", *Applied Economics* **33**, 683—688, 2001.

Crato, N. "Estimation of the maximal moment exponent with censored data", *Communications in Statistics: Simulation and Computation* **29**, 1239—1254, 2000.

Crato, N. and Ray, Bonnie K. "Memory in returns and volatilities of commodity futures contracts", *The Journal of Futures Markets* **20**, 6, 525–544, 2000.

Gomes, C.P., Selman, B., Crato, N., and Kautz, H. "Heavy-tailed phenomena in satisfiability and constraint satisfaction problems", *Journal of Automated Research* **24**, 67–100, 2000.

Breidt, J. F., Crato, N., and de Lima, P. J. F., "On the detection and estimation of long-memory in stochastic volatility," *Journal of Econometrics* **83**, 325–348, 1998.

Gomes, C. P., Selman, B., and Crato, N., "Heavy-tailed probability distributions in combinatorial search", Gert Smolka (Ed.), *Principles and Practice of Constraint Programming—CP 97*, Lecture Notes in Computer Science 1330, Springer, 121–135, 1997.

Crato, N. and de Lima, P. J. F., "On the power of underdifferencing and overdifferencing tests against nearly nonstationary alternatives", *Communications in Statistics: Simulation and Computation* **26**, 4, 1431–1446, 1997.

Crato, N. and Taylor, H. M., "Stationary persistent time series misspecified as nonstationary ARIMA," *Statistische Hefte/Statistical Papers* **37**, 215–223, 1996.

Crato, N., "Some results on the spectral analysis of nonstationary time series," *Portugaliæ Mathematica* **53**, 179–186, 1996.

Crato, N. and Ray, Bonnie K., "Model selection and forecasting for long-range dependent processes," *Journal of Forecasting* 15, 107–125, 1996.

Wu, Ping and Crato, N., "New tests for stationarity and parity reversion: evidence on New Zealand real exchange rates," *Empirical Economics* **20**, 599–613, 1995.

Crato, N. and Rothman, P., "A reappraisal of parity reversion for U.K. real exchange rates," *Applied Economics Letters* **1**, 9, 139–141, 1994.

Crato, N., "Some international evidence regarding the stochastic memory of stock returns," *Applied Financial Economics* **4**, 1, 33–39, 1994.

Crato, N. and de Lima, P., "Long-memory and nonlinearity: A time series analysis of US stock returns and volatilities," *Managerial Finance* **20**, 2/3, 49–67, 1994.

Crato, N. and Rothman, P., "A fractionally integration analysis of long-run behavior for U.S. macroeconomic time series," *Economics Letters* **45**, 3, 287–291, 1994.

Crato, N. and de Lima, P., "Long-range dependence in the conditional variance of stock returns," *Economics Letters* **45**, 3, 281–285, 1994.

Crato, N. and Lopes, A., "Forecasting price trends at Lisbon Stock Exchange," in *A Reappraisal of the Efficiency of Financial Markets,* Taylor, S. *et al.* Springer-Verlag, 1989.

OTHER SELECTED PUBLICATIONS

Crato, N., "Pedro Nunes, Portuguese mathematician and cosmographer, *The Mathematical Intelligencer* **25**, 2003.

Baillie, R.T., Crato, N. and Ray, B.K., "Introduction", *International Journal of Forecasting* **18**, 163–164, 2002.

Teles, P., Crato, N. and Wei, W.W.S. "The Use of Aggregate Time Series in Testing for Long Memory", *Bulletin of the International Statistical Institute*, 52nd Session, 1999, 341–342, 1999.

Breidt, J. F., Crato, N., and de Lima, P. J. F., "Modeling the persistent volatility of asset returns", Proceedings of the IEEE/IAFE Conference on Computational Intelligence for Financial Engineering (CIFEr'97), IEEE, Piscataway, NJ, 266–272, 1998.

Al-Hihi, Joni and Crato, N. "On the Behavior of Tanaka's Test in Presence of Fractionally Integrated Models," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 183–186, 1998.

Crato, N. and Dowling-DaCosta, L. "On the behavior of some estimators for the index of stability", NJIT-CAMS Research Report 9899-6, 1998.

Crato, N. and Ray, Bonnie K., "Some problems in the overspecification of ARMA and ARIMA processes using ARFIMA models," Proceedings of the 3rd Congress of the Portuguese Statistical Society, Salamandra Publ., Lisbon, 527–539, 1996.

Crato, N. and de Lima, P., "Underdifferencing versus overdifferencing tests," American Statistical Association, Proc. of the Business and Economic Statistics Section, 60–65, 1995.

de Lima, P. and Crato, N., "Long-memory in stock returns and volatilities," American Statistical Association, Proceedings of the Business and Economic Statistics Section, 202–207, 1993.

Crato, N. "Long-memory time series misspecified as nonstationary ARIMA," *American Statistical Association, Proc. of the Business and Economic Statistics Section*, 82–87, 1992.

Crato, N. "A decision making rule for the choice of an ARIMA forecasting model," *SE TIMS Proceedings*, vol. XXII, 419–423, 1992.

Crato, N., "Long-Memory time series models: a review," in *Proceedings of the Third CEMAPRE Conference*, 371–391, 1991.

SOME INVITED CONFERENCE AND SEMINAR PRESENTATIONS

"Long memory and non stationarity in human motor control models", ISF 2007, New York, June 2007.

"Long-memory time series: From theory to application", keynote speaker at the Tenth Annual Congress of the Portuguese Statistical Society (SPE), Porto, September 2002.

"Forecasting sardine fisheries" (joint work with F. Borges, M. Santos, and H. Mendes, IPIMAR),

22nd International Symposium on Forecasting, Dublin, June 2002.

"Measuring a tail when we don't see its tip (Estimating parameters of censored stable distributions)", presented at Universidad Carlos III, Madrid, April 2002.

"Basic concepts for forecasting linear models", tutorial at the Second Time Series Arrábida Workshop, Portugal June 1998.

"On the power of underdifferencing and overdifferencing tests against nearly nonstationary alternatives", Society for Nonlinear Dynamics and Econometrics, Sixth Annual Meeting, New York University, March 1998.

"Unit root testing and forecasting", presented at the 17th International Symposium on Forecasting, Barbados, June 1997.

"Models for stochastic volatility: Some new developments", tutorial given at the CIFEr Conference, New York, March 1997.

"Modeling persistence in stochastic volatility," Bell Labs, Murray Hill, NJ, March 1997.

"Global warming uncertainty," Lusófona University, Lisbon, June 1996.

"Nuevos tópicos de investigación in series con memoria larga," short course given at the Department of Statistics of the Universidade de Concepción, Chile, 1995.

"The selection of a forecasting model for long-memory time series," (with Bonnie K. Ray) invited paper presented at the 15th International Symposium on Forecasting, Toronto, June 1995.

"On the detection and estimation of long memory in stochastic volatility," , Department of Statistics, University of Connecticut, April 1995.

"Models for long-memory stochastic volatility," Department of Statistics, Temple University, April 1994.

"Divergence in the forecasting error with misspecified long-memory models," invited paper presented at the 12th International Symposium on Forecasting, Wellington, August 1992.

"Applications of long-memory time series models," seminar organized by invitation of the Department of Quantitative Studies at the Victoria Wellington University, New Zealand, July 1992.

"Competing mathematical models of natural and economic phenomena with random growth," Louisiana Scholar's College, April 1992.

"Fractional differencing in time series models," West Chester University, Pennsylvania, April 1992.

"Forecasting with long-memory models," invited paper presented at the 11th International Symposium on Forecasting, New York, June 1991.

SERVICE TO THE PROFESSION

2011. Guest editor of the *International Journal of Forecasting*.

2007–2011 · Dean (*Pró-reitor*) for Scientific Culture of the Lisbon Technical University.

2007–2010 · President and Scientific Coordinator of Cemapre, Research Center form Applied Mathematics and Economics, ISEG, Lisbon.

2004–2010. President of the Portuguese Mathematical Society (SPM).

2000. General Chair for the 20th International Symposium on Forecasting, ISF 2000, organized by the International Institute of Forecasters.

2000. Guest editor of the *International Journal of Forecasting.*

1999–2001. Member of the board of Fórum Internacional de Investigadores Portugueses (FIIP).

1997–2000. Organizer of the Arrábida Summer time series workshops, jointly promoted by the Center for Applied Mathematics and Statistics (CEMAPRE) of NJIT and the Center for Mathematics and its Applications to Prediction and Economic Decision (CEMAPRE) of ISEG, Lisbon.

1994. Editor of a special issue of *Managerial Finance* "On the predictability of stock market prices".

REFEREEING/REVIEWING

Applied Financial Economics, Communications in Statistics, Computational Statistics and Data Analysis, International Journal of Forecasting, Journal of Applied Statistical Science, Journal of Forecasting, Journal of Time Series Analysis, TEST–A Journal of the Spanish Statistical Society, John Wiley & Sons (Applied Probability and Statistics series).

SCIENTIFIC POPULARIZATION AND SERVICE TO THE COMMUNITY

2010– Crato, N., *Figuring It Out: Entertaining Encounters with Everyday Math,* Heidelberg, London, New York, Copernicus–Springer.

2007– Crato, N., Correia de Oliveira, F. e Metello de Nápoles, S. *Relógios de Sol*, Lisboa, Edições CTT.

2006– Crato, N. (coordinator), *Rómulo de Carvalho: Ser Professor*, Lisboa, Gradiva.

2006– Crato, N. (editor), *Desastre no Ensino da Matemática: Como Recuperar o Tempo Perdido,* Lisboa, SPM/Gradiva.

2006– Crato, N., Santos, Carlos e Tirapicos, Luís. *A Espiral Dourada: Coelhos de Fibonacci, Pentagramas, Cifras e outros Mistérios Matemáticos d'O Código Da Vinci'*, Lisboa, Gradiva.

2006– Crato, N. *O 'Eduquês' em Discurso Directo: Uma Crítica da Pedagogia Romântica e Construtivista*, Lisboa, Gradiva.

2006– · Guest scientist for the radio program *3 minutos de Ciência,* Rádio Europa, Lisbon.

2005– Providência, C., Crato, N., Paiva, M. E Fiolhais, C. *Ciência a Brincar 4: Descobre o Céu*, Lisboa, Bizâncio/Sociedade Portuguesa de Física.

2004– · Resident scientist for the television program *4 × Ciência*, RTPN, Portugal.

2004– Crato, N., Reis, F. E Tirapicos, L. *Trânsitos de Vénus: À Procura da Escala Exacta do Sistema Solar*, Lisboa, Gradiva.

2002– · Member of the Comissão para o Estudo da Matemática e das Ciências (Task force for the study of mathematics and sciences), Ministry of Education, Portugal.

1996– · Science correspondent of the newspaper *Expresso.*

2001– *Zodíaco: Constelações e Mitos*, Gradiva, Lisbon.

1996–2000 Member of the New Jersey Performing Arts Center advising committee.

1999– *Eclipses!*, Gradiva, Lisbon.

1997–2000. Advisor of "Os Lusíadas", The Student Portuguese Club at NJIT.

TEACHING EXPERIENCE

2010– · Professor at the Department of Mathematics, Instituto Superior de Economia e Gestão, Lisbon.

2000–2010 Associate Professor at the Department of Mathematics, Instituto Superior de Economia e Gestão, Lisbon.

1997–2000. Assistant Professor at the Department of Mathematical Sciences of the New Jersey Institute of Technology.

1992–1996. Assistant Professor at the Department of Mathematical Sciences of the Stevens Institute of Technology.

1995– · Invited lecturer for various short courses and for Summer courses in Statistics and Applied Time Series Analysis at ISEG and Lusófona, Portugal, and Universidade de Concepción, Chile.

1982–1985 and 1987–1988 Invited instructor (assistente convidado) at ISEG, UTL, Lisbon.

1985–1987 Invited instructor (assistente convidado) at the University of Azores.

1986–1987 Invited lecturer (professor convidado) of Statistics for the graduate program at the Ponta Delgada Nurse School.

1980–1982 Teacher at the Dona Leonor High School, Lisbon.

SCIENTIFIC AND PROFESSIONAL SOCIETIES

American Mathematical Society, American Statistical Association, Bernouilli Society, FÍIP (International Forum of Portuguese Researchers), International Institute of Forecasters, Centro de Matemática Aplicada à Previsão e Decisão Económica (Lisbon), The Portuguese Author's Society.

HONORS

2008– National medal awarded by the Portuguese Republic President as *Comendador* of Prince Henry Order.

2008– European Union Science Communication Award (ex-Descartes Prize), as second place as Science Communicator of the Year.

2003– First Prize on the Public Awareness of Mathematics contest by the European Mathematical Society

MANAGEMENT EXPERIENCE

2007–2011 Dean at the Technical University of Lisbon

2007–2010 President of Cemapre Research Center.

2004–2010 President of the Portuguese Mathematical Society.

1995–1998 Technical Director of Norma-Aores, a consulting corporation.

LANGUAGES

Portuguese (native); French, English, and Spanish (fluent); Italian (elementary reading).