Curriculum Vitae

Diana Elisabeta Aldea Mendes

April, 2008

Identification

1. Name: **DIANA ELISABETA ALDEA MENDES**

2. Date of born: 30/11/1969

3. Nationality: Romanian

4. Civil status: Married, 2 kids

5. Institutional Address: Department of Quantitative Methods, IBS - ISCTE Business School, ISCTE, Av. das Forças Armadas, 1649-026 Lisbon, Portugal

6. E-mail: diana.mendes@iscte.pt

Degrees

1. 1993 - "Licenciatura"Degree in Mathematics, Babes-Bolyai University, Cluj-Napoca, Romania

2. 1998 - Specialization in Financial Mathematics, FCUL (Faculdade de Ciências de Universidade de Lisboa) Lisbon, Portugal

3. 1999 - Master Degree in Applied Mathematics, FCUL and ISCTE Lisbon, Portugal

4. 2005 - PhD in Mathematics, IST (Instituto Superior Técnico) Lisbon, Portugal

Prizes

1. 1984- 3rd place at the National Olympiad in Mathematics, Romania

2. 2004, 2005, 2006, 2007 - IBS-ISCTE Business School Scientific Research prize.

Administrative tasks

1. Between 2000-2002 - member of the Pedagogical Council

2. Between 2000-2002 - coordination of the 1st year of the Finance Courses

3. Since 2004 - Coordinator of the Quantitative Methods Area, Doctoral Programme in Management

4. Since 2006 - Member of the Executive Committee of the Department of Quantitative Methods

5. Since 2006 - Codirector of the Master Degree in Mathematical Finance, IBS-ISCTE Business School and FCUL

6. Since 2006 - coordination of several disciplines in undergraduate and graduate degrees

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Scientific Projects

1. 1996-1999, Stochastic Processes in Physics and Mathematics , partially funded by PRAXIS and European Union (PRAXIS / PCEX / P/ MA T/ 42 /96).

2. Since 2004, Heterogeneous agents and complexity in optimal monetary policy models, partially funded by FCT (Fundação de Ciência e Tecnologia) and the European Regional Development Fund (ERDF) (POCTI/ECO/48628/2002).

3. Since 2007, New frontiers in applied quantitative finance: nonlinear econometric models, fractional cointegration and econophysics, partially funded by FCT (Fundação de Ciência e Tecnologia), PTDC/GES/73418/2006

4. Since 2007, Exploration of entropy on decision models. Nonlinear dependence, utility and socio-economics welfare analysis, partially funded by FCT (Fundação de Ciência e Tecnologia), PTDC/GES/70529/2006

Teaching Experience

1. Undergraduate Degrees:

   (a) Linear Algebra

   (b) Mathematical Analysis I and II

   (c) Differential Equations

   (d) Complex Analysis

2. Graduate Degrees

   (a) Nonlinear Optimization

   (b) Data Mining (with Neural Networks)

   (c) Computation and Programming with Matlab

   (d) Time Series

(e) Non-linear Models in Finance and Management

(f) Non-linear Dynamics and Chaos Theory

Research areas

1. Discrete dynamical systems

2. Chaos theory and entropy estimation

3. Control and synchronization

4. Time series and nonlinearity

5. Numerical methods and simulations for nonlinear equations

6. Applications in Finance, Economics and Biology

Conferences

1. 1998 - Paper "Representation of Multivalued Maps", at International Congress of Mathematicians (ICM'98), Berlin, Germany.

2. 2001 - Paper "Control of Hyperchaos in an OLG Economic Model", at 11th Annual International Conference of Society of Chaos Theory in Psychology & Life Science, University of Wisconsin, Madison, WI, USA.

3. 2002 - Paper "Active Interest Rate Rules, Chaotic Dynamics and Control", at 12th Annual International Conference of Society of Chaos Theory in Psychology & Life Science, Portland State University, Portland, Oregon, USA.

4. 2002 - Paper "On Topological Entropy of Triangular Maps of the Plane", at 14th European Conference on Iteration Theory, ECIT 2002, Évora, Portugal.

5. 2002 - Paper "Entropy as a Measure of Information in Financial Data", at Applied Mathematics in Economic Conference, Bratislava, Slovak Republic.

6. 2002 - Paper "Symbolic Dynamics and Control in a Labor Market Model", at Third International Conference on Discrete Chaotic Dynamics in Nature and Society, Chuo University, Tokyo, Japan.

7. 2003 - Paper "Information Theory: a Key to Analyses Statistical Dependence in Financial Time Series", at Jornadas Hispanolusas de Gestíon Cientifica em Finanzas, Coruña, Spain.

8. 2003 - Paper "Kneading Theory for Two Dimensional Skew Product Maps", International Conference "Dynamical Systems Denton", University of North Texas, Denton, Texas, USA.

9. 2003 - Paper "Symbolic Dynamics and Control in a Labor Market Model", International Conference of SPIE, Universidade Nova de Lisboa, Portugal.

10. 2003 - Paper "Testing for Cointegration of the Portuguese Stock Market in the Context of Europe and US", at 21th International Conference: Mathematical Methods in Economics, Prague, Check Republic.

11. 2003 - Papers "Mutual Information: a measure of dependency for nonlinear time series" and "Asymmetric price transmission within the Portuguese stock market", at

International Conference: Applications of Physics in Financial Analysis 4, Warsaw, Poland.

12. 2004 - Paper "Entropy-Based Independence Test" at 12th International Workshop on Nonlinear Dynamics of Electronic Systems, Évora, Portugal.

13. 2004 - Paper "Chaotic interest rate rules and stabilization", at 3rd International Conference on Nonlinear Economic Dynamics, Tokyo, Japan.

14. 2004 - Paper "Weighted kneading theory for triangular maps", at 15th European Conference on Iteration Theory, ECIT 2004, Bachus, Austria.

15. 2004 - Paper "Asymmetric Conditional Volatility in the Stock Market: a Cross Country Comparison", at 12th Conference on the Theories and Practices of Securities and Financial Markets", Taiwan.

16. 2005 - Paper "Uncertainty analysis in financial markets: can entropy be a solution?"at 10th Annual Workshop on Economic Heterogeneous Interacting Agents (WEHIA 2005), University of Essex, UK.

17. 2005 - Paper "*Using Maple's Microsoft Excel Add-in*"at Maple Conference 2005, Wilfrid Laurier University, Waterloo ON, Canada.

18. 2005 - Papers: "Co-Movements and Asymmetric Volatility in the Portuguese and US Stock Markets" and "Nonlinear Serial Dependence in Financial Markets"at 12th Annual International Conference on Advanced in Management, Washington DC, USA.

19. 2005 - Papers: "Chaotic Dynamics in Optimal Monetary Policy with a Nonlinear Phillips Curve"and "Computing topological entropy in a Cournot duopoly game

with homogeneous and heterogeneous players"at 4th International Conference on Nonlinear Economic Dynamics, Urbino, Italy.

20. 2005 - Paper: "An econophysics approach to analyses uncertainty in financial markets: an application to the Portuguese stock market"at NEXT-SigmaPhi, 3rd International Conference: News, Expectations and Trends in Statistical Physics, Kolymbari, Greece.

21. 2005 - Paper: "Uncertainty analysis in financial markets: can entropy be a solution?"at 2nd Conference on Information and Entropy Econometrics: Theory, Methods and Applications, American University Campus, Washington DC, USA.

22. 2005 - Paper: "Control of chaotic dynamics in an OLG economic model"no International Conference on Control and Synchronization of Dynamical Systems, León, Mexico.

23. Workshop - Perspectivas em Econofísica, Janeiro de 2006, Universidade de Évora, with the papers:

    (a) *Entropic Information Theory Applied to Uncertainty in Financial Markets.*

    (b) *Asymmetric Signals in Econophysics Models: Dynamic Volatility Modelling, Unit Root and Cointegration.*

    (c) *Control of Chaotic Dynamics in an OLG Economic Model.*

    (d) *Chaotic Dynamics in Optimal Monetary Policy with a Nonlinear Phillips Curve.*

24. EN-SPM, Encontro Nacional da Sociedade Portuguesa de Matemática, Junho de 2006, ISEL Lisboa, with the papers:

    (a) *Produtos Tensoriais em Dinâmicas de Aplicações Triangulares.*

(b) *Sincronização com Ligação Unidireccional de Sistemas Dinâmicos Caóticos.*

25. APFA5 - Applications of Physics in Financial Analysis, 2006, Torino, with the papers:

    (a) *On the Integrated Behaviour of Nonstationary Volatility in Stock Markets.*

    (b) *Asymmetric Conditional Volatility in International Stock Markets.*

    (c) *Symbolic Dynamics in a Matching Labor Market Model.*

    (d) *Chaotic Dynamics in Optimal Monetary Policy with a Nonlinear Phillips Curve.*

26. ICDEA11 - International Conference on Difference Equations and Applications, 2006, Kyoto, with the papers:

    (a) *Computing Topological Entropy in Asymmetric Cournot Duopoly Games with Homogeneous Players.*

    (b) *Endogenous Cycles Optimal Monetary Policy with a Nonlinear Phillips Curve.*

    (c) *Heterogeneous Inflation Expectations and the Stability of Monetary Policy.*

27. Money, Macro and Finance Research Group 38th Annual Conference, 2006, University of York, York, with the paper: *Endogenous Cycles Optimal Monetary Policy with a Nonlinear Phillips Curve.*

28. ECIT 2006 - 16th European Conference on Iteration Theory, 2006, Gargnano, with the papers:

    (a) *Symbolic Dynamics and Control in a Matching Labor Market Model.*

    (b) *Synchronization in Unidirectionally Coupled Nonlinear Maps.*

29. Complex Systems - from Physics to Biology and the Social Sciences, 2006, Faculdade de Ciências da Universidade de Lisboa, with the papers:

(a) *Computing Topological Entropy in Cournot Duopoly Games with Homogeneous and Heterogeneous Players.*

(b) *Synchronization of Chaotic Dynamical Systems.*

30. Econophysics Colloquium 2006, International Christian University (ICU), Tokyo, with the papers:

    (a) *Symbolic Shadowing and the Computation of Entropy for Observed Time Series.*

    (b) *Economic and Financial Determinants in Stock Markets Comovements.*

    (c) *Nonlinear Dynamic Volatility in Stock Markets: from Asymmetric Signals to Econophysics Modeling.*

    (d) *Uncertainty Analysis in Financial markets: can Entropy be a Solution?*

31. APLIMAT 2007 - 6th International Conference on Applied Mathematics, 2007, Bratislava, with the paper: *Efficient Synchronization with Chaotic Quadratic Maps.*

32. APFA6, Applications of Physics in Financial Analysis, 2007, Lisbon, with the papers:

    (a) *Long Memory and Volatility Clustering: is the Empirical Evidence Consistent Across Stock Markets?*

    (b) *Bounded Rational Expectations and the Stability of Interest Rate Policy*

    (c) *Stability Analysis of an Implicitly Defined Labor Market Model*

33. ICDEA12, International Conference on Difference Equations and Applications, 2007, Lisbon, with the papers:

    (a) *Bounded Rational Expectations and the Stability of Interest Rate Policy*

    (b) *Stability Analysis of an Implicitly Defined Labor Market Model*

34. Progress in Difference Equations and Applications, 2008, Laufen, Germany, with the papers

    (a) *Stability Analysis of an Implicitly Defined Labor Market Model*
    (b) *Learning in a Bayesian Game*

Representative Publications

1. Lopes-Pinto, A. and Mendes, D. A., (1998), Representation of Multivalued Maps, *Proceedings of the International Congress of Mathematicians, Documentha Mathematica*, Extra Volume ICM 98.

2. Mendes, D. A., (2000), Versão Abstracta de Optimização, *Temas em Métodos Quantitativos 1*, E. Reis e M. Ferreira eds., Edições Sílabo, Lisboa.

3. Mendes, D. A. and Isfan, T., (2002), Caos e Ruído na Bolsa de Valores de Lisboa, *Temas em Métodos Quantitativos 3,* E. Reis e M. Hill eds, Edições Sílabo, Lisboa.

4. Dionísio, A., Menezes, R. and Mendes, D. A., (2002), Entropy as a measure of information in financial data, *Proceedings of the 8th International Scientific Conference: Quantitative Methods in Economy and Business – Methodology and Practice in the New Millenium.*

5. Mendes, D. A., Sousa-Ramos, J. and Mendes, V., (2002), Symbolic Dynamics and Control in a Labor Market Model, *Proceedings of the Third International Conference on Discrete Chaotic Dynamics in Nature and Society*, Chuo University, Tokyo, Japan.

6. Dionísio, A., Menezes, R. and Mendes, D. A., (2003) , Entropic Measures of Information and Goodness-of-Fit in Financial Data, *Review of Financial Markets*, No. 2, Dezembro de 2003.

7. Dionísio, A., Menezes, R. e Mendes, D. A., (2003), Information Theory: a Key to Analyse Statistical Dependence in Financial Time Series, *Actas das XIII Jornadas Hispanolusas de Gestíon Cientifica, Finanzas*.

8. Ferreira, N. B., Menezes, R. and Mendes, D. A., (2003), Testing for Cointegration of the Portuguese Stock Market in the Context of Europe and US, *Proceedings of the 21th International Conference: Mathematical Methods in Economics*.

9. Ferreira, N. B., Menezes, R. and Mendes, D. A., (2004), Asymmetric Conditional Volatility in the Stock Market: a Cross Country Comparison, *Proceedings of The 12th Conference on the theories and Practices of Securities and Financial Markets*.

10. Dionísio, A., Menezes, R. and Mendes, D. A., (2004), Asymmetric Price Transmission Within the Portuguese Stock Market, *Physica A*, 344, 312-316.

11. Dionísio, A., Menezes, R. and Mendes, D. A., (2004), Mutual Information: a Measure of Dependency for Nonlinear Time Series, *Physica A,* 344, 326-329.

12. Mendes, D. A. and Sousa Ramos, J., (2004), Computing the topological entropy of triangular maps of the plane, *Grazer Math. Ber.,* 346, 283-297.

13. Mendes, D. A. and Sousa Ramos, J., (2004), Kneading theory for triangular maps, *Int. Journal Pure and Appl. Math,* 10 (4), 421-450.

14. Mendes, D. A, Rocha, J. L. and Sousa Ramos, J., (2005), Weighted kneading theory for triangular maps, *Grazer Math. Ber,* forthcoming.

15. Mendes, D. A. and Mendes, V. (2005), Control of chaos in an OLG economic model, *Journal of Physics*, Vol. 23, 158-181.

16. António Teixeira, Diana Mendes and Álvaro Rosa, (2005). Using Maple's Microsoft Excel Add-in, *Proceedings of Maple Conference 2005*, Wilfrid Laurier University, Waterloo ON, Canada.

17. Nuno B. Ferreira, Rui Menezes and Diana A. Mendes, (2005), Co-Movements and Asymmetric Volatility in the Portuguese and US Stock Markets, *ICAM 2005 Proceedings.*

18. Andreia Dionisio, Rui Menezes and Diana A. Mendes, (2005). Nonlinear Serial Dependence in Financial Markets, *ICAM 2005 Proceedings*

19. Andreia Dionisio, Rui Menezes, Diana A. Mendes and Jacinto Silva, (2005). Analysis of the relationship between stock market prices and microeconomic and financial factors: a linear approach, *Journal of International Finance and Economics*, Vol. 1 (1),1-8.

20. Andreia Dionisio, Rui Menezes and Diana A. Mendes, (2006). An econophysics approach to analyse uncertainty in financial markets: an application to the Portuguese stock market, *European Physics Journal B,* Vol. 50 No. 1-2, 161-165..

21. Dionísio, A., Menezes, R. and Mendes, D. A., (2006), Entropy-Based Independence Test, *Nonlinear Dynamics,* 44, 351-357.

22. Rui Menezes, Nuno B. Ferreira and Diana Mendes(2006), Co-movements and Asymetric volatility in the Portuguese and US Stock market, *Nonlinear Dynamics*, 44, 359-366.

23. Dionísio, A., Menezes, R., and Mendes, D.A., (2006), Entropic Information Theory

Applied to Uncertainity in Financial Markets, *Proceedings of the Workshop - Perspectives on Econophysics,* Évora, Janeiro de 2006, A. Dionísio, A. Heitor Reis and Rui N. Rosa (Eds.), University of Évora.

24. Menezes, R., Ferreira, N., and Mendes, D.A., (2006), Asymmetric Signals in Econophysics Modeling: Dynamic Volatility and Threshold Adjustment Models, *Proceedings of the Workshop - Perspectives on Econophysics,* Évora, Janeiro de 2006, A. Dinísio, A. Heitor Reis and Rui N. Rosa (Eds.), University of Évora.

25. Mendes, D.A., Mendes, V. M., Sousa Ramos, J. and Gomes, O., (2007), Computing Topological Entropy in Asymmetric Cournot Duopoly Games with Homogeneous Players, *Advanced Studies in Pure Mathematics.*

26. Dionísio, A., Menezes, R., Mendes, D.A., and Silva, J.V., (2007), Nonlinear Dynamics Within Macroeconomic Factors And Stock Market In Portugal, Nonlinear Dynamics Within Macroeconomic Factors And Stock Market In Portugal, *Applied Econometrics and International Development.*

27. Mendes, D.A., Gomes, O., Mendes, V. M. and Sousa Ramos, J., (2007), Chaotic Dynamics in Optimal Monetary Policy, *T*he European Physical Journal B*,* Vol. 57, No. 2, Pages 121-224.

28. Laureano, R., Mendes, D.A., and Ferreira, M. A., (2007), Efficient Synchronization with Chaotic Quadratic Maps, *Procedings of APLIMAT 2007 - 6-th International Conference on Applied Mathematics*, February 6-9, 2007, Bratislava.

29. Ferreira, N. B., Menezes, R.**,** and Mendes, D.A., (2007), Asymmetric Conditional Volatility in the Stock Market: A Cross Country Comparision, *Procedings of APLIMAT 2007 - 6-th International Conference on Applied Mathematics*, February 6-9, 2007, Bratislava.

30. Ferreira, N. B. , Menezes, R., and Mendes, D.A., (2007), Co-movements and Asymmetric Volatility in the Portuguese and U.S. Stock Markets, *Procedings of APLIMAT 2007 - 6-th International Conference on Applied Mathematics*, February 6-9, 2007, Bratislava.

31. Laureano, R., Ferreira, M. A., and Mendes, D.A., (2008), Sincronização de Sistemas Dinâmicos Contínuos e Caóticos, forthcoming em *Temas em Métodos Quantitativos 6*, D. A. Mendes, F. Salgueiro e L. Martins (Eds.), Edições Sílabo, Lisboa.

32. Dionisio, A., Menezes, R., and Mendes, D.A., (2008),, A Hipótese de Eficiência dos Mercados Revisitada: Abordagem da Dependência Não-Linear, forthcoming em *Temas em Métodos Quantitativos 6*, D. A. Mendes, F. Salgueiro e L. Martins (Eds.), Edições Sílabo, Lisboa.

33. Bentes S. R. , Menezes, R., and Mendes, D.A., (2008), Entropic Measures in Nonlinear Dynamics, forthcoming em *Temas em Métodos Quantitativos 6*, D. A. Mendes, F. Salgueiro e L. Martins (Eds.), Edições Sílabo, Lisboa.

34. S. R. Bentes, R. Menezes and D. A. Mendes (2008), Long Memory and Volatility Clustering: is the Empirical Evidence Consistent Across Stock Markets?, *Physica A*, forthcoming

35. O. Gomes, D. A. Mendes and V. M. Mendes (2008), Bounded Rational Expectations and the Stability of Interest Rate Policy, *Physica A*, forthcoming

36. D. A. Mendes and V. M. Mendes (2008), Stability Analysis of an Implicitly Defined Labor Market Model, *Physica A*, forthcoming

37. Cristina Januário, Clara Grácio, Diana A. Mendes, and Jorge Duarte, (2008), Symbolic dynamics and complexity in an overlapping generation model, Discrete Dynamics in Nature and Society, forthcoming

Master and PhD Thesis coordination

1. Andreia Dionísio, *Medidas da teoria de informação aplicados aos mercados financeiros bolsistas: análise de incerteza e dependência não-linear*, (2006)

2. Nuno R. B. Ferreira, *Não-linearidades e cointegração de índices bolsistas internacionais*, (2005)

3. Rosário Laureano, *Sincronização unidireccional em sistemas dinâmicos discretos*

4. Teodora Isfan, *Análise determinística e estocástica de séries temporais*

5. Cristina Januário, *Skew-products with application in economical models.*

6. Ana Maria Guedes, *Nonlinearity, predictability and noise in technical signals*

7. Jorge Mascarenhas, *Entropia e dinâmica não linear nos mercados financeiros internacionais.*

8. Pedro Ferreira, *Modelos de Predição e Comparação da Acuidade de Predição dos Modelos para os Parâmetros Microbiológicos, Químicos e Indicadores da Qualidade da Água para Consumo Humano, na Estação de Tratamento de Águas de Alcantarilha integrada no Sistema Multimunicipal do Algarve.*

9. Beatriz Brasil, *Lógica Fuzzy: uma aplicação para ensino superior.*

10. Ladislau Filho, *Inovação e Paralelismo nas Organizações sob a ótica da Ciência da Complexidade*

11. Sandra Barão, *Prediction with Neural Nets in Financial time series*

12. Ângela Cancela, *Nonlinearities in time series.*

Referees

1. Physica A

2. Journal of Econometrics

3. European Physical Journal B

4. Temas em Métodos Quantitativos 5 e 6

Editorial Activity

1. D. A. Mendes, F. Salgueiro e L. Martins (Eds.), Temas em Métodos Quantitativos 6 (2008)

2. D.A.Mendes, O.Gomes and R. Menezes, Selected papers from the 6th International Conference on Applications of Physics in Financial Analysis (APFA6), Lisbon, 4-7 July 2007, (2008) (special issue of Physica A)

Scientific Societies

1. Sociedade Portuguesa de Matemática

2. Society for Chaos Theory in Psychology & Life Sciences

3. International Society of Difference Equations

Conference Organization

1. Chair of the Organization Committee of APFA6 - Applications of Physics to Financial Analysis, ISCTE, Lisbon, July 2007.

2. Scientific Committee of PAESS'08, Physics Applied to Economics and Social Sciences, Porto Alegre, 25-29 November 2008

3. Scientific Committee of APFA7 - Applications of Physics to Financial Analysis, Tokyo, March 2009.

Languages

	Conversation	Lecture	Writing
Romanian	very good	very good	very good
Portuguese	very good	very good	very good
English	very good	very good	very good
Hungarian	good	good	good