Curriculum Vitae

Nadi Serhan Aydın, PhD, FRM

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(*This version*: 10/02/2020)

1. Research Areas

- Probability & stochastic processes, quantitative finance, statistical/machine learning, financial risk modelling, numerical/computational methods, neurodynamic programming, financial signal processing, network dynamics.

2. Education

- (10/2011-06/2016) **Ph.D. in Applied Mathematics (Financial Mathematics)**, Institute of Applied Mathematics, **Middle East Technical University**, Ankara, Turkey. GPA: **3.86/4.00**. Dissertation: "*Financial Modelling with Random Bridge Signals and Forward Information*". Co-advisers:
  - Prof. Gerhard-Wilhelm Weber, Middle East Technical University
  - Prof. Anthony G. Constantinides, Imperial College London
- (06/2015-01/2016) **Doctoral Research Fellow**, Financial Signal Processing (FSP) Lab, EEE Department, **Imperial College London**, London, UK (Director: Prof. Anthony G. Constantinides).
- (10/2008-06/2010) **M.Sc. in Applied Mathematics (Financial Mathematics)**, Institute of Applied Mathematics, **Middle East Technical University**, Ankara, Turkey. GPA: **3.81/4.00**. Dissertation: "*Pricing power derivatives: electricity swing options*". (v1: http://goo.gl/vZARv0, v2: https://goo.gl/ONDY7O) Co-advisers:
  - Assoc. Prof. Kasirga Yildirak, Middle East Technical University
  - Prof. Rüdiger Kiesel, University of Ulm
- (08/2009-03/2010) **Master's Exchange Student**, Department of Mathematical Finance, University of Ulm, Ulm, Germany (Adviser: Prof. Rüdiger Kiesel).

- (10/2002-06/2006) **B.Eng. in Management Engineering**, Faculty of Management, **Istanbul Technical University**, Istanbul, Turkey. GPA: **3.24/4.00**. Graduation Project: "*Stock Markets, Banks and Economic Growth: A Panel Data Analysis*".

Other Academic Visits

- (01/2011-02/2011) **PhD Research Visit**, Institute of Applied Mathematics, **Heidelberg University**, Heidelberg, Germany (Adviser: Prof. Dr. Willi Jäger, Collaborator: Dr. Anamaria Bodea).

3. Employment

- (10/2018-) **Chair**, Department of Industrial and Systems Engineering, Istinye University, Istanbul, Turkey
- (10/2018-) **Asst. Prof.**, Department of Industrial and Systems Engineering, Istinye University, Istanbul, Turkey
- (06/2017-) **Founder**, Quanturk: `www.quanturk.org`.
- (01/2017-06/2017) **Part-time Faculty**, Department of Industrial Engineering, TED University, Ankara, Turkey
- (01/2014-12/2015) **Senior Research Economist**, Department of Economic and Social Research, OIC Ankara Centre (SESRIC), Ankara, Turkey.
- (02/2011-12/2013) **Research Economist**, Department of Economic and Social Research, OIC Ankara Centre (SESRIC), Ankara, Turkey.
- (07/2006-10/2007) **Financial Analyst** (as part of Executive Development Programme), Kibar Holding, Istanbul, Turkey.
- (07/2005-07/2006) **Research Associate**, Activeline Banking & Finance Research Center, Istanbul, Turkey.
- (09/2005) **Intern**, Tax & Legal Advisory Division, PricewaterhouseCoopers (PwC), Istanbul, Turkey.
- (08/2005) **Intern**, Treasury, Halkbank, Istanbul, Turkey.
- (08/2004) **Intern**, Quality Assurance, Mercedes-Benz Turk, Istanbul, Turkey.

4. Certifications

- Financial Risk Manager® (2014)
- Google Cloud Platform (GCP) Essentials (2018)

5. Awards & Designations

- International Doctoral Research Scholarship (2015), The Scientific and Technological Research Council of Turkey (TUBITAK), Ankara, Turkey.
- Doctoral Scholarship (2011-2016), The Scientific and Technological Research Council of Turkey (TUBITAK), Ankara, Turkey.
- Graduation with High Honors (2010), Graduate School of Applied Mathematics, Middle East Technical University, Ankara, Turkey.
- Master's Scholarship (2008-2010), The Scientific and Technological Research Council of Turkey (TUBITAK), Ankara, Turkey.
- Scholarship for Financial Risk Manager (FRM) Certification Programme (2009), Global Association of Risk Professionals (GARP).
- Graduation with High Honors (2006), Department of Management Engineering, Faculty of Management, Istanbul Technical University, Istanbul, Turkey.
- University Entry Rank (2001): 2003$^{\text{rd}}$ (nationwide)

6. Programming & Software

- *Proficient:* MATLAB, Python, LaTeX, MS Excel, Eviews
- *Developing*: Java, C++, MySQL

7. Academic Activity

7.1 Research

7.1.1 Graduate Theses

1. Aydin, N.S., 2016. *Financial Modelling with Random Bridge Signals and Forward Information.* **Doctoral Thesis**, Co-advised by Prof. Gerhard-Wilhelm Weber (Middle East Technical University, Turkey) and Prof. Anthony G. Constantinides (Imperial College London, UK).
2. Aydin, N.S., 2010. *Pricing Power Derivatives: Electricity Swing Options.* **Master's Thesis**, Co-advised by Prof. Dr. Ruediger Kiesel (University of Ulm, Germany) and Assoc. Prof. Kasirga Yildirak (Middle East Technical University, Turkey). Full access at: `http://goo.gl/vZARv0` (v1) or `https://goo.gl/ONDY7O` (v2).

7.1.2 Scientific Book(s)/Chapter(s)

1. Aydin, N. S., 2017. *Financial Modelling with Forward-looking Information: An Intuitive Approach to Asset Pricing.* Contributions to Management Science Series, Springer. ISBN 978-3-319-57147-8. `https://goo.gl/S7UuSU`.

2. Aydın, N.S. and Rainer M. 2015. Concept and Mathematics of Interest-free Valuation and Financial Engineering. In: El-Karanshawy, H.A. et al. eds. *Developing Inclusive and Sustainable Economic and Financial Systems*, Vol. 3, ISBN: 978-9927-118-23-4, Bloomsbury Qatar Foundation Journals.

7.1.3 Journal Articles

1. Aydın, N.S. and Rainer, M. 2020. Asset-backed stable numéraire for sustainable valuation. *Journal of Sustainable Finance and Investment* (accepted with revision, ID:19-JSFI397-MP, *Scopus*).

2. Giebel, S., Rainer, M. and **Aydın, N.S.** 2013. Simulation and Prediction of Wind Speeds: A Neural Network for Weibull. *Journal of Iranian Statistical Society*, 12(1), pp. 293-319 (*WoS/Scopus*).

3. Aydın, N.S. and Rainer M. 2013. Valuation of Power Swing Options. *Journal of Energy Markets*, 6(3), pp. 89-110 (*WoS*).

4. Aydın, N.S. and Kucukozmen, C.C. 2010. Stress Testing of Energy-Related Derivative Instruments Based on Conditional Market Risk Models. *Journal of Energy, Market and Regulation*, 1(2), 121-144.

5. Aydın, N.S. 2017. A Quantitative Framework for Testing Portfolio Resilience under IFSB and Basel Capital Rules. *International Journal of Islamic and Middle Eastern Finance and Management*, 10(3), 290-311 (*WoS*).

7.1.4 Journal Preprints

1. Tirkolaee, E.B. and **Aydın, N.S.** –. A bi-objective robust mathematical model for rescue units allocation and scheduling with learning effect (to be submitted: *Computers and Industrial Engineering*, *WoS/Scopus*).

2. Aydın, N.S. –. Mutual Learning in Heterogenous Networks: Application to Limit Order Market (under review: *Journal of Computational Finance*, ID: MS 2101, Scopus/WoS).

7.1.5 Posters

1. Aydin, N.S. and Weber, G.-W., 2018. *Financial Signal Processing with Lévy Information.* International Data Science and Engineering Workshop (IDSEW), May 12-13, Safranbolu, Turkey.

7.1.6 Book Forewords

1. Foreword (with G.-W. Weber and E. Kropat). In: Kharchenko V. and Vasant, P. eds. (2019), *Handbook of Research on Smart Computing for Renewable Energy and Agro-Engineering*, IGI Global, Hershey PA, USA, P. Book link: `bit.ly/2C975b2`. Foreword link: `bit.ly/2WMBANt`.

2. Foreword (with G.-W. Weber and E. Kropat). In: Vasant P. and Voropai, N. eds. (2016), *Sustaining Power Resources through Energy Optimization and Engineering*, IGI Global, Hershey PA, USA, P.

7.1.7 Conference Papers

1. **Aydın**, N.S., 2020. *Financial Pattern Recognition using Deep-Learning-based Image Processing*, Intelligent and Fuzzy Systems (INFUS) 2020, July 21-23, Izmir, Turkey (*Abstract submitted*).

2. Tirkolaee, E.B. and **Aydın**, N.S., 2020. *Integrated Design of Sustainable Supply Chain and Transportation Network using Fuzzy Goal Programming Optimization*, Intelligent and Fuzzy Systems (INFUS) 2020, July 21-23, Izmir, Turkey (*Abstract submitted*).

3. Kiymaz, G., Dindar, A.A., Tugsal, U.M., Tanircan, G. and **Aydın, N.S.**, 2019. *State of the art review on seismic behavior and design of steel storage racking structures*, 5th International Conference on Earthquake Engineering and Seismology, October 8-11, Ankara, Turkey.

4. Aydın, N.S. 2015. *Market Risk Management of Interest-free Portfolios under IFSB and Basel Capital Frameworks: A Quantitative Method for Stress-Testing*. 10th ICIEF, March 23-24, Doha, Qatar.

5. Giebel, S., Rainer, M. and **Aydın, N.S.**, 2011. *Simulation and Prediction of Wind Speeds: A Neural Network for Weibull*. Energy & Finance Conference, October 5-6, Rotterdam, Netherlands.

6. Aydın, N. S., 2011. Concepts and Mathematics of Interest-free Financial Engineering, 8th ICIEF, December 20, Doha, Qatar

7. Aydın, N. S. and Kucukozmen, C.C., 2009. Stress Testing of Energy-Related Derivative Instruments Based on Conditional Market Risk Models, 2^{nd} Multinational Energy and Value Conference, Istanbul, Turkey.

7.2 Projects

1. *Submitted*. Mısır, M., Koc, C.K., **Aydın, N.S.**, 2019. Deep Learning based Diabetic Retinopathy Stage Diagnosis, Change and Risk Prediction (Istinye University BAP Project Application, Date Applied: December 20, 2019). *Corresponding researcher:* Mustafa Mısır (serhan.aydin@istinye.edu.tr).

2. *Submitted*. **Aydın, N.S.** and Mısır, M., 2019. Financial Pattern Recognition and Prediction through Deep-Learning-based Image Processing (Istinye University BAP Project Application, Date Applied: December 20, 2019). *Corresponding researcher:* Nadi Serhan Aydin (serhan.aydin@istinye.edu.tr).

3. *Submitted*. Mahdavi, I., Tirkolaee, E.B., **Aydın, N.S.**, 2019. Sustainable Aggregate Production Planning using Multi-Criteria Optimization, Mathematical Modeling and Dynamic Programming (TUBITAK-MSRT 2535 Project

Application, Date Applied: November 29, 2019). *Corresponding researcher:* Erfan Tirkolaee Babaee (e.babaee@ustmb.ac.ir).

4. *Rejected (September 3, 2019).* Dindar, A.A., Kiymaz, G., Tugsal, U.M., **Aydın, N.S.**, Tanircan, G., 2019. Seismic Safety and Financial Risk Determination of Industrial Storage Racking Systems (TUBITAK 1001 Project Application: #475259, Date Applied: March 20, 2019). *Corresponding researcher:* Ahmet Anil Dindar.

5. *Completed.* Weber, G.-W., Kuter, S., Yerlikaya-Özkurt, F., Kılıç, E., Özmen, A., Karimov, A., Yılmaz, F., **Aydın, N.S.**, Kürüm, E., Öz, H., Aslan-Yıldırım, M.H, 2014. Identification, Optimization and Control of Stochastic Hybrid Systems with Jumps for Financial, Economical and Environmental Processes (BAP#07-05-2014-006, funded by METU). *Corresponding researcher:* Gerhard-Wilhelm Weber.

7.3 Teaching, Training, Seminar

1. [Course] *Computational Thinking* (ECO206/MGN204/ITB208). Department of Industrial and Systems Engineering, Istinye University, Spring 2019/2020, Istanbul, Turkey.

2. [Course] *Probability and Statistics for Engineers* (EEE/COE112). Department of Industrial and Systems Engineering, Istinye University, Spring 2019/2020, Istanbul, Turkey.

3. [Course] *Operations Research / Linear Programming* (ISL305). Department of Industrial and Systems Engineering, Istinye University, Fall 2019/2020, Istanbul, Turkey.

4. [Course] *Differential and Integral Calculus* (YAZ101/301). Department of Industrial and Systems Engineering, Istinye University, Fall 2018/2019, Istanbul, Turkey.

5. [Training] *Financial Modelling and Simulation.* Participation Banks Association of Turkey (TKBB), December 2-3, 2017, Istanbul, Turkey.

6. [Course] *Lean Process Design* (IE212). Department of Industrial Engineering, TED University, Spring 2017/2018, Ankara, Turkey.

7. [Seminar] *Financial Modelling with Lévy Information.* Department of Business, TOBB University of Economics and Technology, November 22, 2016, Ankara, Turkey.

8. [Seminar] *An Exotic Option for Energy Commodities.* Job Market Seminar at SESRIC HQs, Feb 16, 2011, Ankara, Turkey.

9. [Seminar] *Swing Options: A Multi-Ornstein-Uhlenbeck Model and Pricing with Grids.* Institute of Applied Mathematics, Heidelberg University, Feb 4, 2011, Heidelberg, Germany.

10. [Seminar] *Crisis of Mathematical Abuse and Misuse.* Graduate Seminar at the Institute of Applied Mathematics, Middle East Technical University, 2009, Ankara, Turkey.

7.3.1 Reviews (published)

1. [Book]. Calin, O (2017). *Deterministic and stochastic topics in computational finance*, Hackensack, NJ: World Scientific (ISBN 978-981-3203-08-2). xix, 461 p. Review link: `zbmath.org/?q=an:06668012`.

2. [Article]. (review with G.-W. Weber) Larsen, K., Mostovyi, O., Zitkovic, G. (2018). An expansion in the model space in the context of utility maximization. *Finance Stoch.*, 22, No.2, 297-326. Review link: `zbmath.org/?q=an:06856570`.

3. [Article]. (review with G.-W. Weber) Bauschke, H.H., Wang, C., Wang, X., Xu, J. (2018). Subgradient projectors: extensions, theory, and characterizations. *Set-Valued Var. Anal.*, 26, No.4, 1009-1078. Review link: `zbmath.org/?q=an:1422.49014`.

4. [Article]. (review with G.-W. Weber) Goncalves, D.A., Santos, S.A. (2016). Local analysis of a spectral correction for the Gauss-Newton model applied to quadratic residual problems. *Numer. Algorithms*, 73, No. 2, 407-431. Review link: `zbmath.org/`.

5. [Article]. (review with G.-W. Weber) Liu, H. and Liu, Z. (2019). An Efficient Barzilai?Borwein Conjugate Gradient Method for Unconstrained Optimization. *Journal of Optimization Theory and Applications*, 180:879?906. Review link: `zbmath.org/`.

6. [Article]. (review with G.-W. Weber) Latorre, V., Habal, H., Graeb, H., Lucidi, S. (2019). Derivative free methodologies for circuit worst case analysis. *Optimization Letters*, 13:1557?1571. Review link: `zbmath.org/`.

– Further Review Activity

- [Reviewer/Referee] Zentralblatt MATH, Optimization, Journal of Risk Finance, Central European Journal of Operations Research (CJOR), Neural Computing and Applications
- [Item Contributor] Financial Risk Manager (FRM) 2017 Curriculum and Item Writing Drive, Global Association of Risk Professionals

7.4 Conference Commitees

1. [Coordinator] International Forum on Financial Systems (IFFS), September 11-12, 2013, Istanbul (Turkey).
2. [Org. Commitee] 8th and 9th ICIEF Economics and Finance Conferences, December 19-21, 2011, and September 9-10, 2013, in Doha (Qatar) and Istanbul (Turkey), respectively.

3. [Org. Commitee] Conference on Financial Engineering, October 20-21, 2011, Izmir University of Economics, Izmir.

8. Memberships

- [Affiliate] Global Association of Risk Professionals (GARP).
- [Affiliate] Society for Industrial and Applied Mathematics (SIAM)