Curriculum Vitae

Nadi Serhan Aydın, PhD, FRM*

EMAIL: serhan.aydin@istinye.edu.tr
PROFILES: WoS, Scopus, ORCID, GoogleScholar, LinkedIn
ADDRESS: Maltepe Mah., Edirne Cirpici Yolu, No:9
Zeytinburnu 34010, Istanbul, Turkey
MOBILE: +90 532 601 63 01

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1. Research Areas

- Financial engineering and risk modelling, mathematical optimization (health, supply chains, production planning), probability theory & stochastic modelling, machine/statistical learning, dynamic programming, computational methods, simulation.

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 (Türkiye)
  - Prof. Anthony G. Constantinides, Imperial College London (UK)
- (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 (Türkiye)
  - Prof. Rüdiger Kiesel, University of Ulm (Germany)
- (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*".

*Financial Risk Manager (GARP)

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

- (05/2018-present) **Assistant Professor**, Department of Industrial Engineering, ISTINYE UNIVERSITY, Istanbul, Turkey
- (12/2021-03/2022) **Vice Dean**, Faculty of Engineering and Natural Sciences, ISTINYE UNIVERSITY, Istanbul, Turkey
- (05/2018-03/2023) **(Founding) Head**, Department of Industrial Engineering, ISTINYE UNIVERSITY, Istanbul, Turkey
- (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. Academic Activity

4.1 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).

4.2 Scientific Books/Chapters

1. Arslan, E.Y., Kara, S.S., **Aydın, N.S.** & Yildirim, O. (2023). *The Personified Model for Supply Chain Management*. In Multidimensional and Strategic Outlook in Digital Business Transformation: Human Resource and Management Recommendations for Performance Improvement (pp. 191-204). Cham: Springer International Publishing. ISBN 978-3-031-23432-3, DOI: `10.1007/978-3-031-23432-3_16`.

2. 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, DOI: `10.1007/978-3-319-57147-8`.

3. 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.

4.3 Journal Papers

1. Tirkolaee, E. B., **Aydın, N.S.**, & Mahdavi, I. (2023). A bi-level decision-making system to optimize a robust-resilient-sustainable aggregate production planning problem. *Expert Systems with Applications*, 228, 120476. DOI: `10.1016/j.eswa.2023.120476` (*SCIE-Q1*)

2. Tirkolaee, E.B., **Aydın, N.S.**. & Mahdavi, I. (2022). A hybrid biobjective markov chain based optimization model for sustainable aggregate production planning. *IEEE Transactions on Engineering Management*. DOI: `10.1109/TEM.2022.3210879` (*SCIE-Q2*)

3. Tirkolaee, E.B. & **Aydın, N.S.** (2022). Integrated design of sustainable supply chain and transportation network using a fuzzy bi-level decision support system for perishable products. *Expert Systems with Applications*, 195, 116628. DOI: `10.1016/j.eswa.2022.116628` (*SCIE-Q1*).

4. Aydın, N.S., & Tirkolaee, E.B. (2022). A systematic review of aggregate production planning literature with an outlook for sustainability and circularity. *Environment, Development and Sustainability*, 1-42. DOI: `10.1007/s10668-022-02304-8` (*SCIE-Q2*).

5. Aydın, N.S., & Tirkolaee, E.B. (2022). Modelling And Predicting The Growth Dynamics Of Covid-19 Pandemic: A Comparative Study Including Turkey. *Journal of Turkish Operations Management*, 6(1), 943-954 (*TR-Dizin*).

6. Aydın, N.S. (2022). A novel bi-objective model for a multi-period multi-product closed-loop supply chain. *Journal of Engineering Sciences and Design*, 10(1), 38-49. DOI: `10.21923/jesd.999165` (*TR-Dizin*).

7. Aydın, N.S. (2022). Reinforcement-learning-based optimal trading in a simulated futures market with heterogeneous agents. Simulation, 98(4), 321-333. DOI: `10.1177/00375497211061114` (*SCIE-Q3*).

8. Tirkolaee, E.B. and **Aydın, N.S.** (2021). A sustainable medical waste collection and transportation model for pandemics. *Waste Management & Research*, 39(1_suppl), 34-44. DOI: 10.1177/0734242X21100043 (*SCIE-Q2*).

9. Goli, A., Tirkolaee, E.B. and **Aydın, N.S.** (2021). Fuzzy Integrated Cell Formation and Production Scheduling considering Automated Guided Vehicles and Human Factors. *IEEE Transactions on Fuzzy Systems*, 10.1109/TFUZZ.2021.3053838 (*SCIE-Q1*).

10. Tirkolaee, E.B., **Aydın, N.S.**, Weber, G.-W. and Ranjbar-Bourani, M. (2020). A robust bi-objective mathematical model for disaster rescue units allocation and scheduling with learning effect. *Computers & Industrial Engineering*, 149, 10.1016/j.cie.2020.106790 (*SCIE-Q1*).

11. Aydın, N.S. and Rainer, M. (2020). Asset-backed stable numéraire for sustainable valuation. *Journal of Sustainable Finance and Investment*, doi.org/10.1080/20430795.2020.1769983 (*Scopus*).

12. 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 (*SSCI*).

13. 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 (*ESCI/Scopus*).

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

15. 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.

4.4 Under Review / Preprint

1. Aydın, N.S., Dawoud, O. & Tirkolaee, E.B. (2023) Designing a Sustainable Water Supply Strategy through Bi-Objective Mixed-Integer Linear Programming: A Case Study on Gaza Strip (under review with *Water Resources Management*).

2. Aydın, N.S (2023). A seismic hazard-based two-stage stochastic optimization model for pre-disaster optimal allocation of earthquake search and rescue units (to be submitted).

4.5 Projects

1. [Completed] Aydın, N.S., Tirkolaee, E.B., Mahdavi, I., (11/2020–05/2022). Sustainable Aggregate Production Planning using Multi-Criteria Optimization, Mathematical Modeling and Dynamic Programming (TUBITAK-MSRT 2535 Joint Call, Project No: 119N668).

2. [Ongoing] Aydın, N.S. and Mısır, M., (2020–present). Financial Pattern Recognition and Prediction through Deep-Learning-based Image Processing (Istinye University BAP Project Application, Date Applied: December 20, 2019).

3. [Rejected] 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−Rejected: 03/2019−09/2019).

4. [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).

4.6 Conference Proceedings

1. Aydın, N.S., Tirkolaee, E.B., Celik, B. & Mahdavi, I. (2022) A novel multi-objective model for sustainable-robust aggregate production planning problem. International Conference on Science, Engineering Management and Information Technology (SEMIT), February 2-3, Ankara, Turkiye.

2. Aydın, N.S., 2021. Reinforcement Learning based Optimal Trading in a Heterogeneous Agent Network. SIAM Conference on Financial Mathematics and Engineering (FM21), June 1-4 (virtual).

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. Weber, G.-W., Savku, E., Kerimov, A., & **Aydın, N.S.** (2017). Stochastic optimal control of impulsive systems under regime switches and paradigm shifts, in biology, finance and economics. 21th International Federation of Operations Research Societies (IFORS) Triennial Conference, July 15-21, Quebec, Canada.

5. Weber, G.-W., Savku, E., Kerimov, A., & **Aydın, N.S.** (2016). Optimization and Control Reenters under Stochastic Uncertainty, Jumps, Regime Switches and Paradigms Shifts. 14th EUROPT Workshop on Advances in Continuous Optimization, July 1-2, Warsaw, Poland.

6. Weber, G.-W., Savku, E., Kerimov, A., **Aydın, N.S. & Kilic, E.** (2015). Emerging Operational Research, Finance and Economics: Optimal Control under Regime Switches and Paradigm Shifts. 2nd International Conference on Computational and Experimental Science and Engineering (ICCESEN), October 14-19, Antalya, Turkiye.

7. 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.

8. 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.

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

10. 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, Turkiye.

4.7 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.

4.8 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.

4.9 Courses Taught

1. [UG] *Systems Simulation* (ISE304). Compulsory, Department of Industrial Engineering, Istinye University, Spring 2021/22, Spring 2022/23.
2. [UG] *Modellling and Optimization 2* (ISE302). Compulsory, Department of Industrial Engineering, Istinye University, Fall 2022/23, Istanbul, Turkey.
3. [UG] *Industrial Engineering Orientation (1)* (ISE101). Compulsory, Department of Industrial Engineering, Istinye University, Fall 2022/23.
4. [UG] *Introduction to Optimization* (UNI). Elective, Istinye University, Spring 2021/2022.
5. [UG] *Financial Engineering* (ENT084). Elective, Faculty of Engineering and Natural Sciences, Istinye University, Spring 2021/2022.
6. [UG] *Engineering Economics* (ISE203). Compulsory, Department of Industrial Engineering, Istinye University, Spring 2019/2020, Spring 2021/2022.
7. [UG] *Probability & Statistics* (x2) (EEE/COE112/ENS202/MATH208). Compulsory, Faculty of Engineering, Istinye University, Spring 2019/2020, Istanbul, Turkey.
8. [UG] *Operations Research* (ISL305). Compulsory, Department of Management, Istinye University, Fall 2019/2020, Istanbul, Turkey.
9. [UG] *Differential and Integral Calculus* (YAZ101/301). Compulsory, Faculty of Engineering, Istinye University, Fall 2018/2019, Istanbul, Turkey.
10. [UG] *Lean Process Design* (IE212). Compulsory, Department of Industrial Engineering, TED University, Spring 2017/2018, Ankara, Turkey.

4.10 Trainings and Seminars Offered

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

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

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

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

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

4.11 Published reviews

1. [Article review]. (review with G.-W. Weber and S. Gutmen) De Santis, M., Eichfelder, G., Niebling, J., Rocktäschel, S. (2020). Solving multiobjective mixed integer convex optimization problems. *SIAM Journal on Optimization*, 30(4): 3122-3145. Review link: `zbmath.org/`.

2. [Book review]. 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`.

3. [Article review]. (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`.

4. [Article review]. (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`.

5. [Article review]. (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/`.

6. [Article review]. (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/`.

7. [Article review]. (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/`.

5. Certifications

- Financial Risk Manager® (2014)

6. Awards & Designations

- 2535 TUBITAK-MSRT Joint Project Call Grantee (2020), The Scientific and Technological Research Council of Turkey (TUBITAK), Ankara, Turkey.
- 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)

7. Programming & Software

- Python (SciPy, NumPy, Pandas, PuLP, Gurobi, etc.), MATLAB, LaTeX, MS Excel, HTML

8. Memberships

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