Tommi Sottinen's publications and other scribbles

January 30, 2018

Thesis

1. Sottinen, T. (2003) *Fractional Brownian motion in finance and queueing.* Ph.D. Thesis, University of Helsinki.

Publications in refereed journals

2. Sottinen, T. (2001) *Fractional Brownian motion, random walks, and binary market models.* Finance & Stochastics, **5**, 343–355.
3. Kozachenko, Yu., Sottinen, T., and Vasylyk, O. (2002) *Self-similar processes with stationary increments in the spaces* $\mathrm{SSub}_\phi(\Omega)$. Theory Probab. Math. Statist. **65**, 77–88.
4. Kozachenko, Yu., Sottinen, T., and Vasylyk, O. (2002) *Path space large deviations of a large buffer with Gaussian input traffic.* Queueing Systems **42**, no. 2, 113–129.
5. Sottinen, T., and Valkeila, E. (2003) *On arbitrage and replication in the Fractional Black–Scholes pricing model.* Statistics & Decisions **21**, 93–107.
6. Sottinen, T. (2004) *On Gaussian processes equivalent in law to fractional Brownian motion.* Journal of Theoretical Probability **17**, no. 2, 309–325.
7. Sottinen, T., and Tudor, C.A. (2005) *On the equivalence of multiparameter Gaussian processes.* Journal of Theoretical Probability, to appear.
8. Kozachenko, Yu., Sottinen, T. and Vasylyk, O. (2005) *Simulation of weakly self-similar stationary increment* $\mathrm{Sub}_\phi(\Omega)$*-processes: a series expansion approach.* Methodology and Computing in Applied Probability **7**, 379–400.
9. Sottinen, T., and Tudor, C.A. (2007) *Parameter estimation for stochastic equations with additive fractional Brownian sheet.* Statistical Inference for Stochastic Processes **11**, 221–236.
10. Särkkä, S., and Sottinen, T. (2008) *Application of Girsanov Theorem to Particle Filtering of Discretely Observed Continuous-Time Non-Linear Systems.* Bayesian Analysis **3**, no. 3., 555–584.
11. Bender, C., Sottinen, T., and Valkeila, E. (2008) *Pricing by hedging and no-arbitrage beyond semimartingales.* Finance & Stochastics **12**, 441–468.
12. Morlanes, J. I., Rasila, A., and Sottinen, T. (2009) *Empirical evidence on arbitrage by changing the stock exchange.* Advances and Applications in Statistics, no. **2**, Vol. 12, 223–233.
13. Kozachenko, Yu., Sottinen, T., and Vasylyk, O. (2011) *Lipschitz conditions for* $Sub_\phi(\Omega)$*-processes with application to weakly self-similar stationary increment processes.* Theory Probab. Math. Stat. **82**, 57–73.
14. Gapeev, P., Sottinen, T. and Valkeila, E. (2011) *Robust replication in H-self-similar Gaussian market models under uncertainty.* Statistics & Decisions **28**,

37–50.

15. Gasbarra, D., Sottinen, T., and van Zanten, H. (2011) *Conditional full support of Gaussian processes with stationary increments.* Journal of Applied Probability **48**, No. 2.

16. Sottinen, T. and Yazigi, A. (2014) *Generalized Gaussian Bridges.* Stochastic Processes and their Applications **124**, Issue 9, 3084–3105.

17. Azmoodeh, E., Sottinen, T., Viitasaari, L. and Yazigi, A. (2014) *Necessary and Sufficient Conditions for Hölder Continuity of Gaussian Processes.* Statistics & Probability Letters **94**, 230–235.

18. Azmoodeh, E., Sottinen, T. and Viitasaari, L. (2015) *Asymptotic normality of randomized periodogram for estimating quadratic variation in mixed Brownian-fractional Brownian model.* Modern Stochastics: Theory and Applications **2**, No. 1, 29.–49.

19. Sottinen, T. and Viitasaari, L. (2016) *Pathwise integrals and Itô–Tanaka Formula for Gaussian processes.* Journal of Theoretical Probability **29**, Issue 2, 590–616.

20. Sottinen, T. and Viitasaari, L. (2016) *Stochastic Analysis of Gaussian Processes via Fredholm Representation.* International Journal of Stochastic Analysis, doi:10.1155/2016/8694365

21. Pakkanen, M.S., Sottinen, T. and Yazigi, A. (2017) *On the conditional small ball property of multivariate Levy-driven moving average processes.* Stochastic Processes and their Applications, doi:10.1007/s11203-017-9156-6.

22. Sottinen, T. and Viitasaari, L. (2017) *Parameter Estimation for the Langevin Equation with Stationary-Increment Gaussian Noise.* Statistical Inference for Stochastic Processes, doi:10.1007/s11203-017-9156-6

23. Yang, X., Rasila, A. and Sottinen, T. (2017) *Walk on Spheres Algorithm for Helmholtz and Yukawa Equations via Duffin Correspondence.* Methodology and Computing in Applied Probability **19**, 589–602.

24. Sottinen, T. and Viitasaari, L. (2017) *Prediction Law of Fractional Brownian Motion.* Statistics & Probability Letters **129**, 155–166.

25. Shokrollahi, F. and Sottinen, T. (2017) *Hedging in fractional Black-Scholes model with transaction costs.* Statistics & Probability Letters **130**, 85–91.

Publications in refereed proceedings

26. Gilsing, H. and Sottinen, T. (2003) *Power series expansions for fractional Brownian motions.* Theory of Stochastic Processes **9**(25), no. 3-4, (Proceedings of Seventh International School on Mathematical and Statistical Methods in Economics, Finance and Insurance), 38–49.

27. Bender, C., Sottinen, T. and Valkeila, E. (2007) *Arbitrage with fractional Brownian motion?* Theory of Stochastic Processes **13**(29), no. 1-2, (Proceedings of the International Conference "Modern Stochastics: Theory and Applications"), 23–34.

28. Sottinen, T. and Viitasaari, L. (2015) *Fredholm representation of multi-*

parameter Gaussian processes with applications to equivalence in law and series expansions. Modern Stochastics: Theory and Applications **2**, No 3 (Proceedings of PRESTO-2015 conference), 287–295.

Book chapters with referee system

29. Gasbarra, D., Sottinen, T. and Valkeila, E. (2007) *Gaussian bridges.* Stochastic Analysis and Applications: The Abel Symposium 2005. (Eds. F. Benth, G. Di Nunno, T. Lindstrøm, B. Øksendal and T. Zhang) Abel Symposia, Springer.
30. Bender, C., Sottinen, T. and Valkeila, E. (2011) *Fractional procesess as models in stochastic finance.* Advanced Mathematical Methods for Finance. (Eds. G. Di Nunno and B. Øksendal) Series in Mathematical Finance, Springer.

Preprints

31. Sottinen, T. and Valkeila, E. (2001) *Fractional Brownian motion as a model in finance.* Preprint **302**, University of Helsinki, Department of Mathematics.
32. Rasila, A. and Sottinen, T. (2013) *Yukawa Potential, Panharmonic Measure and Brownian Motion.* Preprint, arXiv:1310.2176.
33. Yang, X., Rasila, A. and Sottinen, T. (2015) *Efficient simulation of Schrödinger equation with piecewise constant positive potential.* Preprint, arXiv:1512.01306.
34. Sottinen, T. and Viitasaari, L. (2017) *Conditional-Mean Hedging Under Transaction Costs in Gaussian Models.* Preprint, arXiv:1708.03242.
35. Sottinen, T. and Viitasaari, L. (2018) *Transfer Principle for nth Order Fractional Brownian Motion with Applications to Prediction and Equivalence in Law.* Preprint, arXiv:1801.07574.

Popular articles

36. Sottinen, T. (2004) *Nobelin muistopalkinto taloustieteestä 2003: R. Englen ARCH-malli.* (Nobel memorial prize on economics 2004: R. Engle's ARCH model) Arkhimedes 2004:2, 10–12.
37. Sottinen, T. (2004) *Sattuman matematiikkaa III: Kolmogorovin aksioomat ja frekvenssitulkinta.* (Mathematics of chance III: Kolmogorov's axioms and the frequentistic interpretation) Solmu 2004:2, 17–21.
38. Lehto, S., and Sottinen, T. (2005) *Sisarusongelma - paradoksi ehdollisesta todennäköisyydestä.* (The Sibling problem - A paradox of conditional probability) Solmu 2005:1, 14–15.
39. Rasila, A. and Sottinen, T. (2005) *Algebra, PlayStation ja älykkyys.* (Algebra, PlayStation, and intelligence) Solmu Erikoisnumero 1/2005–2006.
40. Norros, I. and Sottinen, T. (2013) *Esko Valkeila 1951–2012.* Arkhimedes 2013:1, 30–33.
41. Sottinen, T. (2015) *BS-kaava ja lama.* (BS-formula and depression) Arkhimedes 2015:1, 26–30.
42. Sottinen, T. (2016) *Moni sekoaa muotiin.* Professoriblogi 2.5.2016.

43. Sottinen, T. (2016) *Häränpaskahommia.* Professoriblogi 12.9.2016.
44. Sottinen, T. (2016) *Muotia maailmalla.* Professoriblogi 28.11.2016.
45. Sottinen, T. (2017) *Yliopistojen autonomia ja universumin maksimaalisen ironian periaate.* Professoriblogi 27.2.2017.
46. Sottinen, T. (2017) *Avoin tiede.* Professoriblogi 29.5.2017.

Lecture notes

47. Sottinen, T. (2006) *Malliavin-laskenta.* (Malliavin Calculus) Lecture notes, 91 pages.
48. Sottinen, T. (2006) *Rahoitusteoria.* (Mathematical Finance) Lecture notes, 153 pages.
49. Sottinen, T. (2006) *Todennäköisyysteoria.* (Probability Theory) Lecture notes, 131 pages.
50. Sottinen, T. (2008) *Operations Research with GNU Linear Programming Kit.* Lecture notes, 207 pages.
51. Sottinen, T. (2009) *Päätöksenteko epävarmuuden vallitessa.* (Decisions under Uncertainty) Lecture notes, 100 pages.
52. Sottinen, T. (2010) *Operations Research with GNU Octave.* Lecture notes, 187 pages.
53. Sottinen, T. (2011) *Päätöksiä ja Paatoksia* (Decisions and Rants), Lecture notes, 145 pages.
54. Sottinen, T. (2017) *Probability and Stochastic Processes with GNU Octave*, Lecture notes, 166 pages.
55. Sottinen, T. (2018) *Probability and Stochastic Processes with a Twist of GNU Octave towards Queueing*, Lecture notes, 180 pages.