

Neil Shephard (this version: September 2012)

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Born October 8, 1964. Married, 2 children.

Academic Appointments

Main academic positions:

- Professor of Economics (Statutory Chair), Department of Economics, University of Oxford, 2006-.
- Professorial Fellow, Nuffield College, Oxford, 2006-.

Other current academic positions:

- Associate editor, *Econometrica*, 2002-.
- Associate member of the Statistics Department, University of Oxford, 1993-.
- Member of Advisory Board for “Center for Research in Econometric Analysis of Time Series, (CREATES)”, Aarhus University, 2007-.
- Member of the Scientific Panel for the “Center for Financial Econometrics” (CoFie), Singapore Management University, 2009-.
- Member of the Council of the “Society for Financial Econometrics”, 2009-.
- Research Associate of the “Volatility Institute”, New York University, 2009-.
- Member of the Scientific Committee for “BEDOFIH : Base européenne de données financières à haute fréquence,” 2012-.

Past academic positions:

- Founder and Director, Oxford-Man Institute, University of Oxford, 2007-2011.
- Official Fellow in Economics, Nuffield College, University of Oxford, 1993-2006. Professor of Economics (Titular chair), University of Oxford, 1999-2006.
- Gatsby Research Fellow in Econometrics, Nuffield College, University of Oxford, 1991-1993.
- Lecturer in Statistics, London School of Economics, 1988-1993. Tenured 1993.

Education

- Ph.D., London School of Economics, 1990.
- M.Sc., London School of Economics, 1987, Statistics (awarded with distinction).
- B.A., York University, 1986, Economics and Statistics (first class, awarded with distinction).

Main honours

- Awarded “Richard Stone Prize in Applied Econometrics 2012” (for a paper published in *Journal of Applied Econometrics*).
- Elected Fellow of the Society for Financial Econometrics, 2012.
- Awarded Honourary Doctorate in Economics, Aarhus University, 2009.
- Elected Fellow of the British Academy, 2006.
- Awarded “Econometric Theory Multa Scripsit”, 2006.
- Elected Fellow of the Econometric Society, 2004.

Books

5. Unobserved Components and Time Series Econometrics, Oxford University Press, forthcoming (with Siem Jan Koopman), 2013. This is a festschrift in honour of Andrew C. Harvey.
4. Financial Volatility in Continuous Time, Cambridge University Press, 2013, forthcoming (with Ole E. Barndorff-Nielsen).
3. The Methodology and Practice of Econometrics: A Festschrift in Honour of David F. Hendry, Oxford University Press, 2009 (with Jennifer L. Castle).
2. Stochastic Volatility: Selected Readings, edited volume, Oxford University Press, 2005.
1. State Space and Unobserved Component Models: Theory and Applications, edited volume, Cambridge University Press, 2004 (with Andrew C. Harvey and Siem Jan Koopman). This was a festschrift in honour of James Durbin.

Software

2. Statistical Algorithms for Models in State Space Form: SsfPack 3.0 (with Siem Jan Koopman and Jurgen A. Doornik, Timberlake Consultants Press, 2008. [This software has subsequently been ported to most programming languages used in statistics and econometrics]
1. STAMP: Structural Time Series Analyser, Modeller and Predictor (London: Chapman & Hall, 1995), Version 5.0 (London: Chapman & Hall, 1995). Version 6.0, 7.0 and 8.0 (London: Timberlake Consultants Ltd, 2000, 2006, 2008) (with Siem Jan Koopman, A.C. Harvey and Jurgen A. Doornik).

Articles in Journals

56. Multivariate high-frequency-based volatility (HEAVY) models, *Journal of Applied Econometrics*, 2012, 27, 907-933 (with Diaa Noureldin and Kevin K. Sheppard).
55. Integer-valued Levy processes and low latency financial econometrics, *Quantitative Finance*, 2012, 12, 587-605 (with Ole E. Barndorff-Nielsen and David Pollard).
54. Bayesian inference based only on a simulated likelihood, *Econometric Theory*, 2011, 27, 933-956 (with Thomas Flury).
53. Multivariate realised kernels: consistent positive semi-definite estimators of the covariation of equity prices with noise and non-synchronous trading, *Journal of Econometrics*, 2011, 162, 149-169 (with Ole E. Barndorff-Nielsen, Peter R Hansen and Asger Lunde).
52. Nuisance parameters, composite likelihoods and a panel of GARCH models, *Statistica Sinica*, 2011, 21, 307-329 (with Cavit Pakel and Kevin K. Sheppard).
51. Subsampling realised kernels, *Journal of Econometrics*, 2011, 160, 204-219, (with Ole E. Barndorff-Nielsen, Peter R Hansen and Asger Lunde).
50. Realising the future: forecasting with high frequency based volatility (HEAVY) models, 2010, *Journal of Applied Econometrics*, 25, 197-231 (with Kevin K. Sheppard). We were awarded the Richard Stone Prize in Applied Econometrics for this paper in 2012.
48. Testing the assumptions behind importance sampling, *Journal of Econometrics*, 2009, 149, 2-11 (with Siem Jan Koopman and D. Creal).
47. Realised kernels in practice: trades and quotes, *Econometrics Journal*, 2009, (with Ole E. Barndorff-Nielsen, Peter R Hansen and Asger Lunde), 12, C1-C32.

46. The ACR model: a multivariate dynamic mixture autoregression, *Oxford Bulletin of Economics and Statistics*, 2008, 70, 583-618 (with Frederique Bec, Anders Rahbek).
 45. Designing realised kernels to measure the ex-post variation of equity prices in the presence of noise, *Econometrica*, 2008, 76, No. 6, 1481–1536 (with Ole E. Barndorff-Nielsen, Peter R Hansen and Asger Lunde).
 44. Stochastic volatility with leverage: fast and efficient likelihood inference, *Journal of Econometrics*, 2007, 140, 425-449 (with Siddhartha Chib, Yasuhiro Omori and Jouchi Nakajima).
 43. Inference for adaptive time series models: stochastic volatility and conditionally Gaussian state space form, *Econometric Reviews*, 2006, 25, 219-244 (with Charles Bos).
 42. Analysis of high dimensional multivariate stochastic volatility models, *Journal of Econometrics*, 2006, 134, 341-371 (with Siddhartha Chib and Federico Nardari).
 41. Limit theorems for bipower variation in financial econometrics, *Econometric Theory*, 2006, 22, 677-719 (with Ole E. Barndorff-Nielsen, Sven Erik Graversen and Jean Jacod).
 40. Limit theorems for multipower variation in the presence of jumps, *Stochastic Processes and Their Applications*, 2006, 116, 796-806, (with Ole E. Barndorff-Nielsen and Matthias Winkel).
 39. Econometrics of testing for jumps in financial economics using bipower variation, *Journal of Financial Econometrics*, 2006, 4, 1-30, (with Ole E. Barndorff-Nielsen).
 38. Impact of jumps on returns and realised variances: econometric analysis of time-deformed Lévy processes, *Journal of Econometrics*, 2006, 131, 217-252 (with Ole E. Barndorff-Nielsen).
 37. Power variation and time change, *Teoriya Veroyatnostei i ee Primeneniya*, 2005, 50, 115-130 (with Ole E. Barndorff-Nielsen).
- Reprinted in *Theory of Probability and Its Applications*, 2005, 50, 1-15.
36. Likelihood-based estimation of latent generalised ARCH structures, *Econometrica*, 2004, 72, 1481-1517 (with G. Fiorentini and Enrique Sentana).
 35. Econometric analysis of realised covariation: high frequency based covariance, regression and correlation in financial economic, *Econometrica*, 2004, 72, 885-925, (with Ole E. Barndorff-Nielsen).
 34. Power variation and stochastic volatility: a review and some new results, *Journal of Applied Probability*, 2004, 41A, 133-143 (with Ole E. Barndorff-Nielsen and Sven Erik Graversen). This volume was in honour of Christopher C. Heyde.
 33. Power and bipower variation with stochastic volatility and jumps, (with discussion) *Journal of Financial Econometrics*, 2004, 2, 1-48 (with Ole E. Barndorff-Nielsen).
- Reprinted in "*Financial Risk Measurement and Management*," (editor Frank X. Diebold), in Edward Elgar Publishers, 2011, forthcoming.
32. Likelihood analysis of a first order autoregressive model with exponential innovations, *Journal of Time Series Analysis*, 2003, 24, 337-344 (with Bent Nielsen).
 31. Dynamics of trade-by-trade price movements: decomposition and models, *Journal of Financial Econometrics*, 2003, 1, 2-25 (with Tina H. Rydberg).

30. Integrated OU processes and non-Gaussian OU-based stochastic volatility models, *Scandinavian Journal of Statistics*, 2003, 30, 277--295 (with Ole E. Barndorff-Nielsen).
 29. Realised power variation and stochastic volatility models, *Bernoulli*, 2003, 9, 243-265 and 1109-1111 (with Ole E. Barndorff-Nielsen).
 28. Estimating quadratic variation using realised variance, *Journal of Applied Econometrics*, 2002, 17, 457-477 (with Ole E. Barndorff-Nielsen).
 27. Computationally-intensive econometrics using a distributed matrix-programming language, *Philosophical Transactions of the Royal Society of London, Series A*, 360, 2002, 1245-1266 (with Jurgen A. Doornik and David F. Hendry).
 26. Some recent developments in stochastic volatility modelling, *Quantitative Finance*, 2002, 2, 11-23 (with Ole E. Barndorff-Nielsen and Elisa Nicolato).
 25. Econometric analysis of realised volatility and its use in estimating stochastic volatility models, *Journal of the Royal Statistical Society, Series B*, 63, 2002, 253-280 (with Ole E. Barndorff-Nielsen).
- Reprinted in "Stochastic Volatility: Selected Readings, " (editor Neil Shephard), Oxford University Press, 480-514, 2005.
- Reprinted in "Financial Risk Measurement and Management" (editor Francis X. Diebold), Edward Elgar.
24. Markov chain Monte Carlo methods for stochastic volatility models, *Journal of Econometrics*, 108, 2002, 281-316 (with Siddhartha Chib and Federico Nardari).
 23. Normal modified stable processes, *Theory of Probability and Mathematical Statistics*, 2001, 65, 1-19 (with Ole E. Barndorff-Nielsen).
 22. Likelihood inference for discretely observed non-linear diffusions, *Econometrica*, 69, 2001, 959-993 (with Ola Elerian and Siddhartha Chib).
 21. Non-Gaussian Ornstein-Uhlenbeck-based models and some of their uses in financial economics (with discussion), *Journal of the Royal Statistical Society, Series B*, 63, 2001, 167-241, (with Ole E. Barndorff-Nielsen).
 20. Statistical algorithms for models in state space form using SsfPack 2.2, *Econometrics Journal*, 2, 1999, 107-160 (with Siem Jan Koopman and Jurgen A Doornik).
 19. Filtering via simulation: auxiliary particle filter, *Journal of the American Statistical Association*, 94, 1999, 590-599 (with Michael K. Pitt).
 18. Analytic convergence rates and parameterisation issues for the Gibbs sampler applied to state space models, *Journal of Time Series Analysis*, 20, 1999, 63-85 (with Michael K. Pitt).
 17. Likelihood inference for limited dependent processes, *Econometrics Journal*, 1, 1998, C174-C202 (with Aurora Manrique).
 16. Stochastic volatility: likelihood inference and comparison with ARCH models, *Review of Economic Studies*, 65, 1998, 361-393 (with Sangjoon Kim and Siddhartha Chib).
- Reprinted in "Recent Developments in Time Series," (editors Stephen Leybourne and Paul Newbold), in "The International Library of Critical Writings in Econometrics, Volume 2" Edward Elgar Publishers, 2003, 196-228.

Reprinted in "Stochastic Volatility: Selected Readings, " (editor N. Shephard), 2005, 283-322, Oxford University Press.

15. Likelihood analysis of non-Gaussian measurement time series, *Biometrika* 84, 1997, 653-667 (with Michael K. Pitt).

Reprinted in "*Readings in Unobserved Component Models*," A.C. Harvey and T. Proietti, 2005, 368-385, Oxford University Press.

14. Detecting shocks: outliers and breaks in time series, *Journal of Econometrics* 80, 1997, 387-422 (with Anthony C. Atkinson and Siem Jan Koopman).

13. Estimation of an asymmetric model of asset prices, *Journal of Business and Economic Statistics* 14, 1996, 429-434 (with Andrew C. Harvey).

12. Deletion diagnostics and transformations for time series, *Journal of Forecasting* 15, 1996, 1-17 (with Anthony C. Atkinson).

11. The simulation smoother for time series models, *Biometrika* 82, 1995, 339-350 (with Piet de Jong).

Reprinted in "Readings in Unobserved Component Models," A.C. Harvey and T. Proietti, 2005, 354-367, Oxford University Press.

10. Multivariate stochastic variance models, *Review of Economic Studies* 61, 1994, 247-264 (with Andrew C. Harvey and Esther Ruiz).

Reprinted in "ARCH: Selected Readings," (editor Robert F. Engle), 1995, 256-276, Oxford University Press.

Reprinted in "Recent Developments in Time Series," (editors Stephen Leybourne and Paul Newbold), Edward Elgar Publishers, 2003, 135-152.

Reprinted in "Stochastic Volatility: Selected Readings, " (editor Neil Shephard), Oxford University Press, 156-176, 2005.

9. Partial non-Gaussian time series models, *Biometrika* 81, 1994, 115-131.

8. A local scale model: state space alternatives to integrated GARCH processes, *Journal of Econometrics* 60, 1994, 181-202.

7. Fitting nonlinear time series models with applications to stochastic variance models, *Journal of Applied Econometrics* 8, 1993, S135-152.

Reprinted in "Econometric Inference using Simulation Techniques" (editors B.W. Brown, Alain Monfort and Herman K. Van Dijk), Chichester: John Wiley & Sons, 1995, 151-168.

6. Maximum likelihood estimation of regression models with stochastic trend components, *Journal of the American Statistical Association* 84, 1993, 590-595.

5. Distribution of the ML estimator of a MA(1) and a local level model, *Econometric Theory* 9, 1993, 377-401.

4. The exact score for time series models in state space form, *Biometrika* 79, 1992, 823-826 (with Siem Jan Koopman).

3. Numerical integration rules for multivariate inversions, *Journal of Statistical Computation and Simulation* 39, 1991, 37-46.
2. From characteristic function to distribution function: a simple framework for the theory, *Econometric Theory* 7, 1991, 519-529.
1. On the probability of estimating a deterministic component in the local level model, *Journal of Time Series Analysis* 11, 1990, 339-347 (with Andrew C. Harvey).

Articles in Edited Books

19. Volatility, in *Encyclopedia of Quantitative Finance*, edited by Rama Cont, John Wiley and Sons Ltd, Chichester, UK, 2010, 1898-1901 (joint with Ole E. Barndorff-Nielsen).
18. Measuring downside risk: realised semivariance, in *Volatility and Time Series Econometrics: Essays in Honor of Robert F. Engle*, edited by T. Bollerslev, J. Russell and M. Watson (eds), Oxford University Press, 2010, 117-136 (joint with Ole E. Barndorff-Nielsen and S. Kinnebroeck).
17. Stochastic Volatility: Origins and Overview, in T.G. Andersen, R.A. Davis, J.-P. Kreiss and T. Mikosch (eds.) *Handbook of Financial Time Series*, Springer, 233-254, (joint with Torben G. Andersen), 2009
16. Stochastic volatility, in *New Palgrave Dictionary of Economics*, 2nd edition, (edited by Steven Durlauf and Lawrence Blume), MacMillan, 2008. Reprinted in "Macroeconometrics and Time Series Analysis" (edited by Steven Durlauf and Lawrence Blume), MacMillan, 2009.
15. Variation, jumps and high frequency data in financial econometrics (with Ole E. Barndorff-Nielsen) in *Advances in Economics and Econometrics. Theory and Applications, Ninth World Congress*, (edited by Richard Blundell, Persson Torsten and Whitney K Newey), Econometric Society Monographs, Cambridge University Press, 2007, 328-372.
14. Parallel computation in econometrics: a simplified approach (with Jurgen A. Doornik and David F. Hendry) in *Handbook of Parallel Computing and Statistics* (edited by E. J. Kontoghiorghes), Chapman and Hall, 2006, 449-476.
13. Multipower variation and stochastic volatility (with Ole E. Barndorff-Nielsen), *Stochastic Finance*, (edited by A.N. Shiryaev, M.R. Grossinho, P.E. Oliveira, M.L. Esquivel), Springer, 2005, 73-82.
12. A central limit theorem for realised power and bipower variations of continuous semimartingales, in *From Stochastic Analysis to Mathematical Finance, Festschrift for Albert Shiryaev* (edited by Kabanov, Y and R Lipster), Springer, 2006, 33-68, (with O.E. Barndorff-Nielsen, S.E. Gravensen, J. Jacod and M. Podolskij).
11. Introduction, in *Stochastic Volatility* (edited by Neil Shephard), Oxford University Press, 2005, 1-33.
10. Are there discontinuities in financial prices? in *Celebrating Statistics: Papers in Honour of Sir David Cox on his 80th Birthday*, (edited by Anthony Davison, Yadolah Dodge and Nanny Wermuth), Oxford University Press, 2005, 213-231.
9. How accurate is the asymptotic approximation to the distribution of realised volatility? in *Identification and Inference for Econometric Models. A Festschrift for Tom Rothenberg*, (edited by Donald W.K. Andrews and James H. Stock), Cambridge University Press, 2005, 306-331 (with Ole E. Barndorff-Nielsen).
8. Measuring and forecasting financial variability using realised variance with and without a model, in *State Space and Unobserved Component Models: Theory and Applications. Proceedings of a*

Conference in Honour of James Durbin. (Edited by Andrew C. Harvey, Siem Jan Koopman and Neil Shephard), Cambridge University Press, 2004, (with Ole E. Barndorff-Nielsen, Bent Nielsen and Carla Ysusi), 205-235.

7. Auxiliary variable particle filters, in A. Doucet, J.F.G. de Freitas and N.J. Gordon (eds.), *Sequential Monte Carlo Methods in Practice* (New York: Springer-Verlag, 2001), 273-293 (with Michael K. Pitt).

6. Modelling by Lévy processes for financial econometrics, in Ole E. Barndorff-Nielsen, Thomas Mikosch and Sid Resnick (eds.), *Lévy Processes - Theory and Application* (New York: Birkhauser, 2001), 283-318 (with Ole E. Barndorff-Nielsen).

5. A modelling framework for the prices and times made on the New York stock exchange, in W.J. Fitzgerald, R.L. Smith, A.T. Walden and P. C. Young (eds.), *Non-Stationary and Non-Linear Signal Extraction* (Cambridge: Isaac Newton Institute Series, Cambridge University Press, 2000), 217-246 (with Tina Hviid Rydberg).

4. Time varying covariances: a factor stochastic volatility approach, (with discussion) in J.M. Bernardo, J.O. Berger, A.P. Dawid and A.F.M. Smith (eds.), *Bayesian Statistics 6, Proceedings of the Sixth Valencia International Meeting* (Oxford: Oxford University Press, 1999), 547-570 (with Michael K. Pitt).

3. Statistical aspects of ARCH and stochastic volatility, in D.R. Cox, David V. Hinkley and Ole E. Barndorff-Nielsen (eds.), *Time Series Models in Econometrics, Finance and Other Fields* (London: Chapman & Hall, 1996), 1-67.

Reprinted in the *Survey of Applied and Industrial Mathematics*, issue on Financial and insurance mathematics, 3, 764-826, Scientific Publisher TVP, Moscow, 1996 (in Russian).

2. Outliers and switches in time series, in P. Mandl and M. Huskova (eds.), *Asymptotic Statistics* (Heidelberg: Physica-Verlag, 1994), 35-48 (with A.C. Atkinson and Siem Jan Koopman).

1. Structural time series models, in G.S. Maddala, C.R. Rao and H.D. Vinod (eds.), *Handbook of Statistics, Vol. 11 Econometrics* (Amsterdam: North Holland, 1993), 261-302 (with A.C. Harvey).

Comments and Notes

8. Comment on "Realised variance and market microstructure noise," by Hansen and Lunde, *Journal of Business and Economic Statistics*, 2006, 179-181 (with Ole E. Barndorff-Nielsen).

7. Comment on "Numerical techniques for maximum likelihood estimation of continuous-time diffusion processes," by Durham and Gallant, *Journal of Business and Economic Statistics*, 2002, 325-327 (with Siddhartha Chib).

6. Second order for the discussion of "Time series analysis of non-Gaussian observations based on state space models from both classical and Bayesian perspectives," by Durbin and Koopman, *Journal of the Royal Statistical Society, Series B*, 62, 2000, 30-32.

5. State space modelling and simulation filter methods, *Book 1, Proceedings of 52nd session of International Statistical Institute* 1999, 187-190, Helsinki, Finland (with Michael K. Pitt).

4. Antithetic MCMC for non-Gaussian measurements with applications to stochastic volatility, *American Statistical Association, 1996 Proceedings of the Bayesian Statistics Section*, 1997, 81-86 (with Michael K. Pitt).

3. Comment on "Bayesian analysis of stochastic volatility models," by Jacquier, Polson and Rossi, *Journal of Business and Economic Statistics* 11, 1994, 406-410 (with Sangjoon Kim).

2. Tabulation of Farebrother's test for linear restrictions in linear regression models under heteroscedasticity, *Econometric Theory* 8, 1992, 583-584.

1. The singular-value decomposition of the first-order difference matrix, *Econometric Theory* 6, 1990, 119-120.

Editor of Journal Special Issues

“Realised volatility,” *Journal of Econometrics*, 160, 2011, (with Nour Meddahi and Per Mykland).

“Cointegration and dynamics in Economics,” *Journal of Econometrics* 80, 1997 (with David F. Hendry).

Current or former member of editorial boards

Current: *Econometrica*, associate editor, 2002-

Former: *Review of Economic Studies*, Editorial board and later also a director, 1999-2005. *Biometrika*, associate editor, 1997-2000. *Journal of the Royal Statistical Society, Series B*, associate editor, 1993-96. *Econometrics Journal*, coordinating editor, 1998-2002.

Websites

Realized library, <http://realized.oxford-man.ox.ac.uk/>.

The Oxford-Man Institute's "realised library" contains daily non-parametric measures of how volatility financial assets or indexes were in the past. Each day's volatility measure depends solely on financial data from that day. They are driven by the use of the latest innovations in econometric modelling and theory to design them, while we draw our high frequency data from the Reuters DataScope Tick History database. Realised measures are not volatility forecasts. However, some researchers use these measures as an input into forecasting models. The realized measures are computed every night and recorded on the website.

Consultancies, Government advice or policy pieces

1. Statistical consultant: BBC, British general election night forecasting team member, 2001 and 2005.
2. Author: “Towards setting student numbers free”, 2010, (with Nicholas Barr).
3. Author: “Deferred fees for universities”, *Economic Affairs*, 2010, 30, 2, 40-44.
4. Member, Ministerial group on data sharing, UK Department for Business, Innovation and Skills, 2011-.
5. Man Group plc, financial econometrics advice, 2011-.

Main Administrative Contributions inside Oxford University

1. Leading academic responsible for founding the Oxford-Man Institute, University of Oxford, 2007 (fund-raising for this and the endowment was worth around £22M to Oxford University). Founding director, 2007-2011.
2. With Colin Mayer, leading academic responsible for the founding of the Masters in Financial Economics course in Oxford, which started in 2005.