Angelos DASSIOS

BA (Cantab.), MSc, DIC, PhD

Department of Statistics	Phone: +442079557749
London School of Economics	Fax: +442079557416
Houghton Street	A.Dassios@lse.ac.uk
London	http://stats.lse.ac.uk/angelos
WC2A 2AE	

Qualifications

1980 - 1983: Trinity College, Cambridge. BA(Hons), in Mathematics.
1983 - 1984: Imperial College, London, MSc in Statistics. Awarded a mark of Distinction.
1985 - 1987: Imperial College, London, Department of Mathematics, PhD.

Employment

2013-: London School of Economics, Department of Statistics, Associate Professor (Reader).
1999-2013: London School of Economics, Department of Statistics, Reader.
1991 - 1999: London School of Economics, Lecturer in Actuarial Science.
1989 - 1991: London School of Economics, Temporary Lecturer in Statistics.
1989: Imperial College, London. Dept. of Electrical Engineering. Control Theory Group. Research Assistant to Professor MHA Davis.
1987 - 1988: National Service at the Greek Navy.
1987: Interamerican SA, Athens.

Other appointments

1992 - : Swiss Federal Institute of Technology, Zürich. Forschungsinstitut für Mathematik. Visiting Research fellow
1990 - 1991: University of Kent at Canterbury, Visiting lecturer in Actuarial Science (part time).
2003 : Visitor from October to December, Department of Statistics, Columbia University, New York.
2004: Visitor from January to April, Department of Mathematics, Stanford University.
2006 - : Chief examiner for the the course Statistics 2 of the external degree program of the University of London.
2006 - : Singapore Institute of Management. Visiting lecturer

Current Research

1. Quantile options and options based on occupation times. I have done an amount of research on this (see items [3], [4], [5] and [10] on the main publications list, which can be summarised by an identity that obtains the distribution of the quantile of a Lévy process as the convolution of two independent random variables, the supremum and the infimum of two independent copies of the process. My current research focuses on two points. Multidimensional extensions of the identity and some special properties that the median has.

2. Excursion theory for Lévy processes and the generalisation of Parisian option results. This research also has an interface to insurance mathematics, as it leads to the calculation of the probability of "Parisian type" ruin. This is the event that the process crosses a level and stays at one side of it for a continuous time interval of fixed length. See [14], [15], [16], on the main publications list as well as papers to be submitted and conference papers. This is ongoing research which is now focusing on direct computational approaches rather than Laplace transform inversion (see [22])

3. Multidimensional models for default risk. This goes beyond measuring the so called "correlation" of default rates and affine processes, Default in one asset has an effect on the default rate of another asset. This comes on top of any dependence structure between the default rates. Some of the first results in this as well as important connections to the theory of point processes can be found in [17], [28] and [30].

4. Asian options when the underlying price is not a geometric Brownian motion; see for example [11] in the main publications list for the square root process.

5. Point processes and their application as claim arrival processes in general insurance. For general results see item [8] on the main publications list and for estimation problems and the use of the Kalman filter in this setup, see [9]. Moreover, one can demonstrate that the processes are nice models for the delayed settlement of claims, see [21]. Current research is focusing on advanced dynamic contagion models (see [18]). Related work using Cox models can be found in [19], [24] and [27].

6. Developing statistical tests for independence and association (this is joint with W. Bergsma, see [25]).

7. Mixed Poisson models in Applied Statistics (with Robert Crouchley) (see [29] and [6] for older results).

PhD theses

Completed

1. Ji-Wook Jang, 1998, Doubly Stochastic Point Processes in Reinsurance and the Pricing of Catastrophe Insurance Derivatives.

2. Sankarshan Basu, 1999, Approximating Functions of Integrals of Log-Gaussian Processes: Applications in Finance.

3. J Nagaradjasarma, 2003, Path-dependent Functionals of Constant Elasticity of Variance and Related Processes: Distributional results and Applications in Finance.

4. T H S Boafo-Yirenkyi, 2004, Valuing credit spread options under stochastic volatility / interest rates

5. S. Nathan, 2005, Derivative Pricing in a Markov-Chain Jump-Diffusion Setting

6. C. Strom, 2007, Pricing and Hedging in an Incomplete Interest Rate Market: Applications of the Laplace Transform

7. S. Wu, 2009, Excursions of Lévy processes and its Applications in Mathematical Finance and Insurance

8. T. Yamada, 2010, Essays on Mathematical Finance: Applications of Moment Expansions and Filtering Theory

9. X. Che, 2011, Markov-type models for large-valued inter-bank payment systems

10. H. Zhao, 2012, A Dynamic Contagion Process for Modelling Contagion Risk in Finance and Insurance.

11. J.W. Lim, 2013, Parisian excursions of Brownian motion and their application in Mathematical Finance, viva pending.

Continuing

1. Youyou Zhang, Excursions and point processes.

2. Zhanyu Chen, Self-duality and semi-static hedging.

3. Shiju Liu, Excursions of Lévy processes.

4. Ali Habibnia, Financial Statistics

Publications and Submitted papers

1. *Insurance, Storage and Point Processes: An Approach via Piecewise Deterministic Markov Processes*, 1987, PhD thesis, Imperial College, University of London.

2. Martingales and insurance risk, 1989, *Communications in Statistics, Stochastic Models*, **5**(2), 181-217, (with P. Embrechts).

3. The distribution of the quantiles of a Brownian motion with drift and the pricing of related path dependent options, 1995,*Annals of Applied Probability*, **5**(2), 389-398.

4. Sample quantiles of additive renewal reward processes, 1996, *Journal of Applied Probability*, **33**, 1018-1032.

5. Sample quantiles of stochastic processes with stationary and independent increments and of sums of exchangeable random variables, 1996,*Annals of Applied Probability*, **6**(3), 1041-1043.

6. Interpreting the Beta-Geometric in comparative fecundability studies (with R. Crouchley), 1998, *Biometrics*, **54**(1), 140-146

7. Cox process with log-normal density (with S. Basu), 2002, *Insurance, Mathematics and Economics*, **31**(2), 297-302

8. Pricing of catastrophe reinsurance & derivatives using the Cox process with shot noise intensity (with J. Jang), 2003, *Finance and Stochastics*, **7**(1), 73-95.

9. Kalman–Bucy filtering for linear systems driven by the Cox process with shot noise intensity and its application to the pricing of reinsurance contracts. (with J. Jang), 2005, *Journal of Applied Probability*, **42**(1), 93-107.

10. On the quantiles of the Brownian motion and their hitting times, 2005, *Bernoulli*, **11**(1) 29-36.

11. The square root process and Asian options (with J. Nagaradjasarma), *Quantitative Finance*, 2006, **6**(4) 337-347.

12. Bonds and options valuation using a conditioning factor approach (with S. Basu), *Management Dynamics*, 2007, **7**(2), 25-69

13. The distribution of the interval between events of a Cox process with shot noise intensity (with J. Jang), 2008, *Journal of Applied Mathematics and Stochastic Analysis*.

14. On barrier strategy dividends with Parisian implementation delay for classical surplus processes (with S. Wu), 2009, *Insurance Mathematics and Economics*, **45**, 195-202

15. Perturbed Brownian motion and its application to Parisian option pricing (with S. Wu), 2010, *Finance and Stochastics*, **14**, 473-494.

16. Double barrier Parisian options (with S. Wu), 2011, *Journal of Applied Probability*, **48**(1), 1-20.

17. A dynamic contagion process (with H. Zhao), 2011, *Advances in Applied Probability*, **43**(3), 814-846 .

18. Ruin by Dynamic Contagion Claims, (with H.Zhao), 2012, *Insurance Mathematics and Economics*, **51**(1), 93-106.

19. A double shot noise process and its application in insurance (with J Jang), 2011, *Journal of Mathematics and System Science*.

20. Stochastic boundary crossing probabilities for the Brownian motion (with X Che), 2013, *Journal of Applied Probability*, **50**(2), 419-429

21. A risk model with delayed claims, (with H Zhao), 2013, *Journal of Applied Probability*, **50**(3), 686-702.

22. Parisian option pricing: A recursive solution for the density of the Parisian stopping time, (with J. W. Lim), 2013, *SIAM J. Financial Mathematics*, **4**(1), 599-615.

23. Exact Simulation of Hawkes Process with Exponential Decaying Intensity, (with H. Zhao), 2013, *Electronic Communications in Probability*, **18:**0 http://ecp.ejpecp.org/article/view/2717

24. A bivariate shot noise process for insurance (with J Jang), 2013, *Insurance Mathematics and Economics*, **53**(3), 524-532.

25. A consistent test of independence based on a sign covariance related to Kendall's tau, 2014, (with W. P. Bergsma), *Bernoulli*, to appear

26. A Dynamic Contagion Process with Diffusion, (with H.Zhao), submitted to*Stochastic Processes and their Applcations.*

27. A shot noise process with a renewal process as aggregate accumulated/discounted claim process (with J Jang), submitted to the *European Actuarial Journal*

28. A Markov chain model for contagion (with H Zhao), submitted to *Stochastic Models*.

29. A Subject Specific Interpretation of Between Group Differences in the Compound Poisson Model, (with R Crouchley) submitted to *Statistics and Computing*.

30. Stationarity of a two-dimensional dynamic contagion process, (with X Dong), submitted to the *Electronic Journal of Probability*).

To be submitted shortly (resubmissions or at an advanced stage)

1. Parisian corridor options, draft completed but not yet submitted (possible outlet Annals of Applied Probability).

2. Recursive formulae for two sided Parisian options (with J W Lim), draft almost completed but not yet submitted (possible outlet *Mathematical Finance*).

3. Length and height of Brownian excursions (with J W Lim), draft almost completed but not yet submitted (possible outlet*Annals of Probability*).

4. Parisian excursions for the Brownian meander (with J W Lim), draft almost completed but not yet submitted (possible outlet*Journal of Applied Probability*).

5. On last passage times (with Y Zhang) to be decided.

6. Diffusion approximations and Kalman filtering for two-dimensional dynamic contagion process, (with X Dong), draft almost completed but not yet submitted (possible outlet *Journal of Applied Probability*)

Other papers in preparation

1. Risk theory with the inverse Gaussian process

2. Asymptotic properties of Brownian excursions

3. Options with Parisian exercise time

4. Variability orderings of functionals of Lévy processes.

5. Some hitting problems involving the reflected Brownian motion

Conference papers and presentations

1. Approximating integrals of exponential functions of Gaussian processes (with S. Basu), paper presented to the *Bernoulli society conference, Indian Statistical Institute*, Calcutta, December 1997.

2. Approximations of log-normal interest rate models, poster, *RSS98*, Glasgow,with S.Basu, September 1998.

3. Approximating call options on assets with stochastic volatility,*4th Iranian International Statistical Conference*, with S.Basu, August 1998.

4. Approximating prices of bonds with log-normal interest rate, *Workshop on Quantitative methods in finance*, Aix en Provence, with S. Basu, June 1999.

5. The calculation of options on assets with stochastic volatility,*International Conference in Mathematical Finance*, Hammamet, Tunisia, with S. Basu, June 1999.

6. Quantile and other options dependent on the occupation times of the Brownian motion, *Workshop on Financial Mathematics*, Edinburgh, July 1999.

7. Quantile and other related options, 1^{st} *Aegean Conference in Actuarial Science and Financial Mathematics*, Samos, May 2000, invited speaker.

8. Square root processes and Asian options (with J. Nagaradjasarma), *Bachelier Finance Society, Third World Congress*, Chicago, July 2004

9. Pricing of Asian Options on Interest Rates in the CIR Model, (with J. Nagaradjasarma), *IASTED International Conference in Financial Engineering*, Cambridge, USA, November 2004.

10. Quantile and other occupation time options, *The* 5^{th} *International Conference on Statistical Finance and Financial Engineering*, Hitotsubashi, Tokyo, March 2005.

11. Parisian options and ruin probabilities, *Bachelier Finance Society*, *Fourth World Congress*, Tokyo, August 2006.

12. Counterparty default risk in affine processes with jump decay, *Bachelier Finance Society, Fourth World Congress*, Tokyo, August 2006. (with P. Sculli)

13. Pricing of catastrophe reinsurance and derivatives with a Cox process with shot noise intensity *Climate Change and Financial Markets: catastrophe instruments, reinsurance, securitisation and risk transfer* , Warwick Financial Research Institute, January 2008, invited speaker.

14. Parisian options, excursions, occupation time and ruin, *Bachelier Finance Society, Fifth World Congress*, London, July 2008. (with S. Wu)

15. Point Processes with Contagion and an Application to Credit Risk *Bachelier Finance Society, Sixth World Congress*, Toronto, July 2010. (with H. Zhao).

16. Parisian Option Pricing: A Recursive Solution for the Distribution of Parisian Stopping Times, *Bachelier Finance Society, Seventh World Congress*, Sydney, June 2012. (with J. W. Lim).

17. Dynamic Contagion Models: Applications in Finance and Insurance, *Spring School in Financial and Actuarial Mathematics Liverpool 2013 - SSLAM 2013,* April 2013, invited speaker.

18. Dynamic Contagion Models, *26th Greek Statistical Meeting "Statistics in Actuarial, Finance and Risk Management"*, Piraeus, May 2013, invited speaker.

19. Dynamic Contagion Models, *6th International Conference of the ERCIM WG on Computational and Methodological Statistics (ERCIM 2013), "Inference for counting processes"*, fortcoming, London, December 2013, invited speaker.

Working papers

Please see `http://scholar.google.co.uk/citations?user=o6uW_C4AAAAJ&hl=en&oi=ao`, `http://lse.academia.edu/AngelosDassios` and `http://stats.lse.ac.uk/angelos` for a selection of working papers as well as links to published ones.

Books in preparation

1. Martingale Methods in Finance, Insurance and Risk Management, with J. Jang. (at the proposal stage)

2. An Introduction to Path Dependent Options, currently lecture notes, LSE.

Other conferences - Seminars

In addition to the conferences listed above, I have given various seminars at the LSE, Columbia University, Stanford University, Imperial College, Heriot-Watt University, King's College, Institut Henri Poincaré, Queen Mary and Westfield College, The Universities of Bath, Warwick, Copenhagen, Sussex, Oxford, Swansea, City University, The University of Crete, the National University of Malaysia and ETH at Zürich. I have attended various UK Actuarial Teachers Meetings from 1990 to today and given talks on most occasions. I presented a paper at the International Meeting on Risk Theory at Ascona, Switzerland during March 1993. I have participated in various sessions of the Financial Mathematics programme of the Isaac Newton Institute at Cambridge. I organised the risk and Stochastics day at LSE in 2011 and have participated as a speaker on previous occasions.

Grants

1996: ABI (Association of British Insurers) grant to support a Ph.D. student on the project Doubly Stochastic Point Processes in Reinsurance and the Pricing of Catastrophe Insurance Derivatives; beneficiary was J. Jang 2003: Grant by the Leverhulme Trust to finance my visit to the Columbia and Stanford Universities working on credit risk. Duration was seven months.

2003: Grant by the Leverhulme Trust to finance my visit to the Columbia and Stanford Universities working on credit risk. Duration was seven months.

Teaching and examining experience

I have designed most of the courses for the Actuarial Science degree and have been responsible for running it as course director since 1992. I am responsible for the teaching of Actuarial Courses at the LSE and at various times I have taught all of them. I also teach courses on Probability and Distribution Theory, Stochastic Processes, Statistics, and Stochastic Calculus and Mathematical Finance. My teaching is both at undergraduate and postgraduate level. I also taught Actuarial Applied Statistics at the University of Kent in 1990 and 1991. I am also a chief examiner for the the course Statistics 2 of the external degree program of the University of London and a visiting lecturer at the Singapore Institute of Management. A full list of the courses taught is available on request.

I have examined PhD theses at LSE (more than once), Imperial College, the University of Warwick, KU Leuven, the University of Cardiff as well as the University of Cambridge (more than once).

Other activites

Editor of special issue on *"Application of Stochastic Processes in Insurance", RISKS*.

I have refereed papers for journals including *Mathematical Finance*, *Finance and Stochastics*, *Insurance: Mathematics and Economics*, *Quantitative Finance*, the *International Journal of Theoretical and Applied Finance*, the *ASTIN Bulletin*, the *North American Actuarial Journal*, the *Scandinavian Actuarial Journal*, the *Annals of Applied Probability*, the *Applied Probability* group of journals, *Stochastic processes and their Applications*, *Statistics and Probability Letters*, the *Electronic Journal of Probability*, the *Journal of Optimization Theory and Applications* and many others.

I have also been a regular reviewer of research papers and books for *Mathematics Reviews* for many years.

I have also refereed various research grant proposals for EPSRC.

Administrative Duties

2007-2013 : External Programmes Board, LSE.
2007-2008 : Representative to the Academic Board, Department of Statistics, LSE.
2007- : IT representative, Department of Statistics, LSE.
2002- : Teaching committee, Department of Statistics, LSE.
1998- : Chair of examiners for Actuarial Science at LSE.
1997 - 2002: Departmental Representative to the Academic Studies Committee.
1997- 2005: Departmental Representative to the Admissions Committee.
1996-2005 : Admissions Tutor.
1994- : Universities Liaison Committee, Institute of Actuaries.
1994 - : Departmental Tutor.
1992- : Course Tutor for the BSc in Actuarial Science degree.
1991- : Ex-Officio member of the Staff-Student Committee.
1991 - 1993: I managed the Staff Research Fund (Statistics Division).