

## Publication list of Anatoliy Swishchuk

### 1 Books:

8. **Swishchuk A. V. and Wu J. (2003)** *Evolutions of Biological Systems in Random Media. Limit Theorems and Stability* Kluwer AP, Dordrecht, The Netherlands, 218p. ISBN 1-4020-1554-2. Serie: Mathematical Modelling: Theory and Applications, v. 18.

7. **Swishchuk A.V. (2000)** *Random Evolutions and Their Applications. New Trends.* Kluwer Academic Publishers, Dordrecht, The Netherlands, v.504, 315p. ISBN 0-7923-6264-0.

6. **Korolyuk V.S. and Swishchuk A.V. (2000)** *Evolutionary Stochastic Systems. Algorithms of Averaging and Diffusion Approximation.* Mathematics and its Applications. Seria: Theory Probability and Mathematical Statistics, v. 33, Institute of Mathematics, National Academy of Sciences of Ukraine, Kyiv, Ukraine. 344p. (In Russian). ISBN 5-12-004265-1.

5. **Swishchuk A.V. (1997)** *Random Evolutions and their Applications.* Kluwer Academic Publishers, Dordrecht, The Netherlands, v.408, 215 p. ISBN 0-7923-4533-9.

4. **Korolyuk V.S. and Swishchuk A.V. (1995)** *Evolution of Systems in Random Media.* CRC Press, Boca Raton, USA. 356 p. ISBN 0-8493-9405-8.

3. **Korolyuk V.S. and Swishchuk A.V. (1995)** *Semi-Markov Random Evolutions.* Kluwer Academic Publishers, Dordrecht, The Netherlands. 310 p. ISBN 0-7923-3150-8.

2. **Korolyuk V.S. and Swishchuk A.V. (1992)** *Semi-Markov Random Evolutions.* Naukova Dumka Publishing, Kiev. 256 p. (In Russian). ISBN 5-12-003165-X.

1. **Korolyuk V.S. and Swishchuk A.V. (1990)** *Applied Problems of the Theory of Random Evolutions.* Znannya, Kiev, Ukraine. 30 p. (In Russian)

### 2 Research papers:

70. **Elliott, R. and Swishchuk, A. (2007)** Pricing Options in Markov-Modulated Fractional Brownian Markets, *IMA Journal of Management Mathematics* (special Issue on Financial Mathematics).
69. **Elliott, R. and Swishchuk, A. (2007)** Pricing Options and Variance Swaps in Markov-Modulated Brownian Markets, *Hidden Markov Models in Finance*, Springer (International Series in Operations Research and Management Science).
68. **Swishchuk, A. (2006)** Modeling and Pricing of Variance Swaps for Multi-Factor Stochastic Volatilities with Delay, *Canadian Applied Mathematics Quarterly*, Volume 14, Number 4, Winter.
67. **Kazmerchuk, Y., Swishchuk, A. and Wu, J.-H. (2006)** The Pricing of Options for Security Markets with Delayed Response, *Mathematics and Computers in Simulation*.
66. **Kazmerchuk, Y., Swishchuk, A. and Wu, J.-H. (2005)** A Continuous-time GARCH model for stochastic volatility with delay, *CAMQ*, Volume 13, Number 2.
65. **Swishchuk, A. (2005)** Modeling and Pricing of Variance Swaps for Stochastic Volatilities with Delay, *WILMOTT Magazine*, Issue 19, September 2005, pp. 63-73.
64. **Swishchuk, A. (2004)** Modeling of Variance and Volatility Swaps for Financial Markets with Stochastic Volatilities, *WILMOTT Magazine, September Issue, Technical Article No 2*, pp. 64-72.
63. **Swishchuk, A. and Wu, J. (2004)** Averaging and Merging of Stochastic SARS Models, *LIAM, Technical Report*, 12p.
62. **Liang, D., Swishchuk, A., Wu, J. and Zhang, F. (2004)** Modeling and Analysis of Stochastic Models for Marine Bacteria Populations, *LIAM, Technical Report*, 28 p.
61. **Ivanov, A. and Swishchuk, A. (2004)** "Global Stability of a Stochastic Differential Delay Equations", University of Ballarat, SITMS, Ballarat, Australia, *Research Report 04/06*, March 2004, 18p.
60. **Swishchuk A. V. and Wu J. (2003)** Averaging and diffusion approximation of vector difference equations in random media with applications to biological systems, *Differential Equations and Dynamical Systems* 11, no. 1-2, 243-271.
59. **Swishchuk A. V. and Wu J. (2003)** Limit theorems for difference equations in random media with applications to biological systems, *Random Operators and Stochastic Equations*, 11:1, 2003, pp. 25-76.
58. **Ivanov, A., Kazmerchuk, Yu. and Swishchuk, A. (2003)**

"Theory, Stochastic Stability and Applications of Stochastic Differential Delay Equations" A Survey of Recent Results", *Differential Equations and Dynamical Systems* 11, no. 1-2, 55-115.

57. **Ivanov, A. and Swishchuk, A. (2003)** "Optimal Control of Stochastic Differential Delay Equations", *Applied Mathematics Letters*, December, 6p. (submitted).

56. **Swishchuk A. (2002)** Price Pseudo-Variance, Pseudo-Covariance, Pseudo-Volatility, and Pseudo-Correlation Swaps-In Analytical Closed-Forms, Proceedings of the Sixth PIMS Industrial Problems Solving Workshop, PIMS IPSW 6, University of British Columbia, Vancouver, Canada, May 27-31, 2002, pp. 45-55. Editor: *J. Macki, University of Alberta*, June 2002. (So-joint report with Raymond Cheng, Stephen Lawi, Andrei Badescu, Ham-mouda Ben Mekki, Asrat Fikre Gashaw, Yuanyuan Hua, Marat Molyboga, Tereza Neocleous, Yuri Petrachenko).

55. **Kazmerchuk Yu., Swishchuk A. and Wu J. (2002)** A Continuous-time GARCH model for stochastic volatility with delay (submitted to *European Journal of Applied Mathematics*).

54. **Kazmerchuk Yu., Swishchuk A. and Wu J. (2002)** The Option Pricing Formula for Security Markets with Delayed Response (submitted to *Mathematical Finance*).

53. **Swishchuk A. V. and Wu J. (2002)** Stability of difference equations in random media in averaging and diffusion approximation schemes. Applications to biological systems, 12 p., *Technical Report N6, LIAM*, Dept. of Math. and Stat., York University, Toronto, Canada.

52. **Swishchuk A. V. and Wu J. (2002)** Normal deviations and merging of difference equations in random media with applications to biological systems, 14 p., *Technical Report N5, LIAM*, Dept. of Math. and Stat., York University, Toronto, Canada.

51. **Swishchuk A. V. and Elliott R. (2002)** Studies of completeness of Brownian and fractional (B,S,X)-securities markets, 20p. (working paper)

50. **Swishchuk A.V. and Svishchuk M.Ya. (2001)** Stability of stochastic differential Poisson equations with delay, *Ukrain. Math. J.*, v.53, No 12.

49. **Swishchuk A. V. and Kazmerchuk Yu. I. (2001)** Stability of stochastic Ito equations with delay, Poisson jumps and Markov switchings with applications to finance, *Theory Probab. and Mathem. Statis.*, v.64 (translated by AMS, N64,2002).

48. **Griego R. J. And Swishchuk A. V. (2000)** A Black-Scholes

formula for a securities markets in random environment, Theory Probab. and Mathem Statist., v.61.

47. **Mishura Yu. S. And Swishchuk A. V. (2001)** Stochastic stability of fractional (B,S)-securities markets, Applied Statistics, Financial and Insurance Mathematics, Donetsk, Ukraine, v.1, N2.

46. **Swishchuk A.V., Zhuravitskiy D.G. and Kalemanova A.V. (2000)** Analogue of Black-Scholes formula for (B,S,X)-incomplete securities market. Ukrain. Mathem. Journal, v.52, No3.

45. **Swishchuk A.V. and Filinkov A. (1999)** Stochastic optimal control of Markov random evolutions. Stochastic and Stochastic Reports, 10p. (submitted).

44. **Swishchuk A.V. and Svishchuk M.Y. (1998)** Stability of stochastic evolutionary equations with random impulse action. Visnyk Kyiv University, v.2, p.38-42 (in Ukrainian)

43. **Swishchuk A.V. and Rubinov A.M. (1999)** Some stochastic models for economics. Research Report, 19/99, May 1999, University of Ballarat, Ballarat, Australia, 10p.

42. **Swishchuk A.V. and Ivanov A.F. (1999)** Stochastic differential delay equations and stochastic stability: A survey of some results. Research Report, 2/99, January 1999, University of Ballarat, Ballarat, Australia, 23p.

41. **Swishchuk A.V. and Kalemanova A.V. (2000)** Stochastic stability of interest rates with jumps. Theory probab. & Mathem statist., TbiMC Sci. Publ., v.61.

40. **Swishchuk A.V. and Goncharova S.Y. (1998)** Optimal control of semi-Markov risk processes. Nonlinear Oscillations, No2, 122-131.

39. **Swishchuk A.V. and Goncharova S.Y. (1999)** Stability of semi-Markov risk processes in normal deviations scheme. Theory probab. & Mathem statist., TbiMC Sci. Publ., No59.

38. **Swishchuk A.V. and Goncharova S.Y. (1999)** Stability of semi-Markov risk processes in averaging and diffusion approximation schemes. Ukrain. Mathem. Journal, v.51, N07.

37. **Swishchuk A.V. and Goncharova S.Y. (1999)** Stability of semi-Markov processes. Dopovidi National Acad. Sci. of Ukraine, No7.

36. **Swishchuk A.V. and Lukin A.E. (1998)** Interpolation and extrapolation problems for random evolution processes. Theory probab.& Math.statistics, TBiMC Sci. Publ., Kyiv, Ukraine, v.58, 163-167.

35. **Swishchuk A.V. and Lukin A.E. (1998)** Filtering problems for random evolution processes. Ukrain.Mathem. Journal, v.50, N12, 1701-1705.

34. **Swishchuk A.V. and Burdeiniy A.G. (1998)** Optimal control of evolutionary stochastic systems and its application to stochastic models of financial mathematics. *Ukrain. Math. J.*, v.50, No5, 687-698.
33. **Swishchuk A.V. and Zhuravitskii D.G. (1997)** Applications of discontinuous evolutionary stochastic systems in financial mathematics. *Doklady NASU*, Kyiv, Ukraine, No 7.
32. **Swishchuk A.V. and Lukin A.E. (1997)** Some aspects of applications of continuous evolutionary systems in financial mathematics. *Doklady NASU*, Kyiv, Ukraine, No8.
31. **Swishchuk A.V. and Burdeiniy A.G. (1996)** Stability of evolutionary stochastic systems and its applications in financial mathematics. *Ukrain. Mathem. Journal*, v.48, No 10, 1386-1401 (In Ukrainian).
30. **Swishchuk A.V. (1995)** Semi-Markov Random Evolutions: Some Ideas, Methods and Results. In: *Exploring Stochastic Laws. Festschrift in honour of the 70th birthday of academician Korolyuk V.S.* Eds. Skorokhod A.V., Borovskich Y.V. VSP, The Netherlands, 417-443.
29. **Swishchuk A.V. (1995)** Hedging of options under mean-square criterion and with semi-Markov volatility. *Ukrain. Math. J.*, 47, No7.
28. **Swishchuk A.V. (1994)** Martingale problem and stochastic integral equation in a Banach space for limit semi-Markov random evolutions. II. *Random Operators & Stochastic Equations*. v.2, 303-328.
27. **Swishchuk A.V. (1994)** Martingale problem and stochastic integral equation in a Banach space for limit semi-Markov random evolutions. I. *Random Operators & Stochastic Equations*. v.2, 277-301.
26. **Swishchuk A.V. (1994)** Stability of semi-Markov evolutionary stochastic systems in averaging and diffusion approximation schemes. In: *Proceed. of Inst. of Math.*, Kiev, 255-269.
25. **Swishchuk A.V. (1992)** Limit theorems for semi-Markov random evolutions and their applications. Doctor phys.&math.sci.thesis. Manuscript. Kiev, Inst. of Math., 353p. (In Russian).
24. **Swishchuk A.V. (1992)** Limit theorems for semi-Markov random evolutions and their applications. Abstracts of doctor phys.&math.sci.thesis. Kiev, Inst. of Math., 37 p. (In Russian).
23. **Swishchuk A.V. (1992)** Double approximation of semi-Markov random evolutions. *Ukrain. Math. J.*, 44, 400-408. (In Russian).
22. **Swishchuk A.V. (1991)** Uniqueness of the solution of martingale problem for semi-Markov random evolutions. In: *Asymptot. Meth. in the problems of random evolutions*. Kiev, Inst. of Math, 92-107. (In Russian).

21. **Swishchuk A.V. (1990)** Solution of martingale problem for semi-Markov random evolutions. In: Asymptot. and applied problems of the theory of random evolutions. Kiev, Inst.of Math, 98-107. (In Russian).
20. **Swishchuk A.V. (1990)** Rates of convergence in the limit theorems for semi-Markov random evolutions. In: Stochastic systems and their applications. Kiev, Inst.of Math, 86-92. (In Russian).
19. **Korolyuk V.S. and Swishchuk A.V. (1989)** Weak convergence of semi-Markov random evolutions (martingale approach). In: Probab.Theory&Math.Stat. VSP/TVP Publishers, Utrecht/Moscow, p.1-9.
18. **Swishchuk A.V. (1989)** Martingale approach to central limit theorem in averaging scheme for semi-Markov random evolutions.In: analyt.methods of investigation of the evolution of stochastic systems. Kiev, Inst.of Math, 95-107. (In Russian).
17. **Swishchuk A.V. (1989)** Weak convergence of semi-Markov random evolutions in averaging scheme (martingale approach). Ukrain.Math.J.,41, 1680-1686. (In Russian).
16. **Koroluk V.S. and Swishchuk A.V. (1989)** Limit representation of semi-Markov random evolution in series scheme. Ukrain.Math.J.,41, 1476-1482. (In Russian).
15. **Korolyuk V.S. and Swishchuk A.V. (1989)** Central limit theorem for inhomogeneous semi-Markov random evolutions. Ukrain. Math.J., 41, 1064-1070. (In Russian).
14. **Korolyuk V.S. and Swishchuk A.V. (1989)** Weak convergence of semi-Markov random evolutions in averaging scheme. Theory Probab.&Math.Stat., 42, 80-90. (In Russian).
13. **Korolyuk V.S. and Swishchuk A.V. (1989)** Phase merging of inhomogeneous semi-Markov random evolutions. Ukrain.Math.J., 41, 163-170. (In Russian).
12. **Swishchuk A.V. (1988)** Diffusion approximation of operator Markov processes by discrete random evolutions. Doklady Ukrain.Ac.Sci. No.11, 23-25. (In Russian).
11. **Swishchuk A.V. (1988)** Representation of multiplicative operator functionals of semi-Markov processes. Doklady Ukrain.Ac.Sci.,No.10, 27-28. (In Russian).
10. **Swishchuk A.V. (1988)** Limit theorems for stochastic differential equations with semi-Markov switchings. In: Analyt.Meth. in Probab.Prob. Kiev, Inst.of Math, 82-90. (In Russian).
9. **Swishchuk A.V. (1987)** Limit theorems for random evolutions on

Lie groups. In: Asymptot.Meth.in problems of probab.theory. Kiev, Inst.of Math, 103-109. (In Russian).

8. **Korolyuk V.S., Korolyuk V.V and Swishchuk A.V. (1987)** Central limit theorem in phase merging scheme for semi-Markov random evolutions. Ukrain.Math.J., 39, 314-319. (In Russian).

7. **Korolyuk V.S. and Swishchuk A.V. (1986)** Central limit theorem for semi-Markov random evolutions. Ukrain.Math.J., 38, 330-334. (In Russian).

6. **Swishchuk A.V. (1986)** Order's  $d \geq 1$  phase merging of semi-Markov random evolutions. In: Asymp methods in Probab.Theory. Kiev, Inst.of Math, 110-114. (In Russian).

5. **Swishchuk A.V. (1985)** Limit theorems for storage processes. In: Asymp.methods in reliability theory. Kiev, Inst.of Math, 115-118. (In Russian).

4. **Swishchuk A.V. (1985)** Limit theorems for semi-Markov random evolutions in asymptotic phase merging scheme. Kiev, Institute of Math. Abstracts of Candidate Sciences Thesis, 19 p. (In Russian).

3. **Swishchuk A.V. (1985)** Limit thorems for semi-Markov random evolutions in asymptotic phase merging scheme. Kiev, Institute of Math. Candidate Sciences Thesis, 116 p. (In Russian).

2. **Swishchuk A.V. (1984)** Limit theorems for semi-Markov random evolutions. In: Asymptot. methods in problems of Probab.Theory. Kiev, Institute of Math., 112-119. (In Russian).

1. **Swishchuk A.V. (1983)** Limit theorems for Markov random evolutions. In: Asymptot. methods in Probab. Theory. Kiev, Institute of Math., 92-97. (In Russian).

### 3 Contributions to conferences

37. Elliott R. & Swishchuk A. Pricing Options and Variance Swaps in Markov-modulated Brownian and fractional Brownian Markets, *RJE 2005 Conference*, July 24-27, 2005, U of C, Calgary, AB, Canada (<https://www.math.ucalgary.ca/~aswish/elliottswpaper1.pdf>)

36. Ivanov A. and Swishchuk A. Optimal control of stochastic differential delay equations with application in economics, SMOCS05 Conference, Daydream Island Resort, Australia, July 10-16, 2005

([http://www.conferences.unimelb.edu.au/smocs05/SMOCS\\_Papers/ivanov.pdf](http://www.conferences.unimelb.edu.au/smocs05/SMOCS_Papers/ivanov.pdf)).

35. Kazmerchuk Yu., Swishchuk A. and Wu J. Black-Scholes Formula Revisited: Security Markets with Delayed Response, Bachelier Finance Society 2nd World Congress, Crete, Greece, June'2002

(<http://www.ma.utexas.edu/Bachelier2002>)

34. Swishchuk A. V. (B,S,X)-securities markets. Ukrainian Mathematical Congress, Kiev, Ukraine, 21-23 August'2001, Abstracts of Commun..

33. Swishchuk A. V. (B,S,X)-securities markets. The Intern.Conf. "Stoch. Anal & its Appl.", 10-17 June'2001, Lviv, Ukraine. Abstracts of Commun., p.75.-Lviv-2001.

32. Swishchuk A.V. and Goncharova S.Y. (1999) Stochastic stability and optimal control of semi-Markov risk processes. In: 3rd Ukrainian-Scandinavian Conf. in Probab. Theory & Mathem. Statist., 8-12 June'1999, Kyiv, Ukraine, Abstracts, p.148.

31. Swishchuk A.V. (1998) Stochastic stability and optimal control of semi-Markov risk processes in insurance mathematics. In: Proceed. 2nd Intern. Sympos. on Semi-Markov Models: Theory and Applications; Eds.: J. Janssen, N. Limnios; Univ. De Techn. De Compiegne, 9-11 December'1998; Sec 11: Economics&Finance, p.1-6.

30. Swishchuk A.V. (1998) Stochastic stability of semi-Markov risk processes. In: Proceed. Conf. In Applied Mathem & Mechan., GAMM'98, Bremen, Germany, 9-13 April'98, p.119.

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23. Swishchuk A.V. (1994) Control of evolutionary stochastic systems. In: 12th Prague Conf. on Stoch. Proc., Prague, 1994. Prague, Inst.of Inform.Th.and Autom., 235-238.

22. Swishchuk A.V. ( 1993) Stability of semi-Markov evolutionary stochastic systems in the limit theorems. In: 6th Intern. Vilnius Conf. Prob. Th.& Math.Stat., Abstracts of Communications, 2, Vilnius, Mosklas, 149.

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19. Swishchuk A.V. (1992) Semi-Markov random evolutions: a survey of the recent results. In: Trans.11th Prague Conf. Inform. Th., Stat.des.func., rand.proc., Prague, 27-30 August'90. Prague, Academia Publ., 403-414.

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16. Swishchuk A.V. (1990) The solution of martingale problem for random evolutions. In: 2nd World Congr. Bern.Soc. for Math.Stat. and Probab.; Uppsala, Sweden, 13-18 August'90. Abstracts. NY, 190.

15. Swishchuk A.V. (1990) On the rates of convergence in the limit theorems for semi-Markov random evolutions. In: II Prague Conf. on Inform. Th., Stat. Des.Func. and Rand.Proc., Prague, 27-31 August'90. Abstracts. Prague, 170.

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12. Butsan G.P. and Swishchuk A.V. (1990) Evolutionary stochastic systems: theory and applications in physics and biology. Ukrain.Math.J.,42, 446-447 (In Russian).

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## 4 Preprints

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5. Swishchuk A.V. (1995) Stochastic calculus for integrals over martingale measures. Preprint 95.3. Inst. of Math., Kyiv, Ukraine, 49 p.

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