

Marie-Claire L. Koissi-K., Ph.D
Curriculum Vitae

**CONTACT
INFORMATION**

Actuarial Science Program
Department of Mathematics
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**RESEARCH
INTERESTS**

Actuarial Science: Longevity Risk, Risk Assessment, Fuzzy Logic Applications to Risk Assessment. Numerical Methods. Subject Classifications: (JEL) C6, (AMS) 91B30, 03B52, 65K10, 68N17, 90C20, 90C70.

EDUCATION

Ph.D. in Applied Mathematics (Actuarial Science - Life Insurance), June 2006
The Finnish Graduate School in Stochastics, Åbo Akademi, Finland
<http://web.abo.fi/fak/mnf/mate/gradschool>
• Dissertation Topic: “*Modeling Mortality Rates: Improvement, Uncertainty and Effect on Life Annuities*”.
• Advisors:
Pr. Arnold F. Shapiro, Ph.D., F.S.A. (Penn State University, PA, USA, Director of Actuarial Sciences and Risk Management program) and
Pr. Göran Högnäs, Ph.D. (Åbo Akademi, Applied Math-Stochastics Processes)

Philosophy Licentiate, Applied Mathematics (Mathematics Statistics)
Åbo Akademi, Finland Dec 2003

University of Abidjan, Ivory Coast,
B.Sc. in Mathematics (Operational Research), June 1999
DUES II, Undergraduate Univ. Diploma in Advanced Studies (Math-Physics)

Ecole Normale Supérieure, Abidjan, Ivory Coast, Nov. 1995
CAP-CM, Teaching License in Mathematics for Secondary and High School

APPOINTMENT

Actuarial Science Program, Dep of Math, University of Wisconsin, Eau Claire
– *Tenure-Track Associate Professor* Aug. 2014 -present
Department of Mathematics, Western Illinois University, Macomb, IL, USA
– *Associate Professor with tenure* Jun. 2012 – June 2014
– *Tenure-Track Assistant Professor* Aug. 2007 – Jun. 2011
The Pennsylvania State University, Mont Alto campus, PA, USA
– *Instructor of Mathematics* Sep. 2006 – May 2007
Åbo Akademi, The Finnish Graduate School in Stochastics, Finland.
– *Research Scientist in Applied Mathematics* Oct. 2002 – Jul 2006
Max Planck Institute, Laboratory of Longevity, Rostock, Germany
– *Visiting Scholar* Oct. 2001 – Feb. 2002
National Ministry of Education, Ivory Coast
– Mathematics teacher: public secondary and high school Sep. 1995 – 1999

GRANTS AND AWARDS

- Research Grant, 2013-2014, Shapiro A.F. and Koissi, M.-C., Title of project “Risk Assessment Applications of Fuzzy Logic”. From the Society of Actuaries, the Canadian Actuarial Society, and the Joint Risk Management Section:
- University of Wisconsin-EC, Faculty/Student Research ORSP Grant:
2016 - “Predictive analysis of Big Data: application to S&P 500”(R. Stodola)
2015- “Longevity Risk in Solvency Framework” (with Alex Brown)
2014- “Introduction to Longevity Risk” (with Andrew Smeed).
- Professional Achievement Awards (areas: teaching, research, and services)
2013, Western Illinois University, Macomb, IL.
- Magnus Ehrnrooths Stiftelse Research Grant, Finland (2005 and 2003)
- Åbo Akademi Foundation Research Grant, Finland (2005).
- Åbo Akademi Foundation Student Grant, Finland (2003/ 2004, 2001/2002).
- Max Planck Institute, Young Researcher Grant, Germany (2001 / 2002)

Publications

1. Koissi and Shapiro, “Adjusting the Analytic Hierarchy Process for Fuzziness”, under review
2. Koissi and Shapiro, “Mortality Risk, a Review of Methods”, under review
3. Shapiro and Koissi, March 2015, “Risk Assessment Applications of Fuzzy Logic”, Society of Actuaries, Joint Risk Management Section.
4. Koissi and Shapiro, 2015, “Using Fuzzy Logic to Model Risk: Case Studies”, *Actuarial Research Clearing House (ARCH) – SOA*
5. Koissi and Shapiro, 2014. “Applying Fuzzy Optimization to Risk Assessment”, *Actuarial Research Clearing House ARCH*.
6. Koissi and Shapiro. 2013-1. “Credibility Theory in a Fuzzy Environment” ARCH Risk Theory. 6pp.
7. Berry-Stölzle, Koissi, Shapiro. 2010. “Detecting Fuzzy Predictor Variables: the Case of Insurer Solvency Surveillance in Germany.” *Insurance: Mathematics and Economics* 46, 554-567.
8. Shapiro, Berry-Stölzle, Koissi. 2010. “The Fuzziness in Regression Models” ARCH 2010-1, Statistical Method (3), 6pp.
9. Koissi and Shapiro, 2009. “The Lee-Carter Model under the Condition of variable Age-Specific parameters.” ARCH 2009-1, Mortality Models (1), 32 pp.
10. Shapiro and Koissi. 2009. “Fuzzy Regression, Diamond Distance, and the Term Structure of Interest Rates.” ARCH 2009-1, Finance (5), 28 pp.
11. Koissi. 2006. “Longevity and adjustment in pension annuities, with application to Finland.” *Scandinavian Actuarial Journal* 4, 226-242.
12. Koissi, Shapiro, Högnäs. 2006. “Evaluating and extending the Lee-Carter model for mortality forecasting: Bootstrap confidence interval.” *Insurance: Mathematics and Economics* 38, 1-20. [In Sep. 2011, this article was ranked in the Top 10 citations for the last five years (2006-2011) in IME]
13. Koissi and Shapiro. 2006. “Fuzzy formulation of the Lee-Carter model.” *Insurance: Mathematics and Economics* 39, 287-309.

14. Koissi and Högnäs. 2006. "Effects of family frailty on child mortality: Ivory Coast experience." *World Health & Population*, 1-9.
15. Koissi and Högnäs. 2005. "Using WinBUGS to Study Family Frailty in Child Mortality, with an Application to Child Survival in Ivory Coast." *African Population Studies* 20 (1), 1-17.

Selected Conference Presentations

1. Shapiro and Koissi, Speaker. "Fuzzy Application to Health Risk Assessment: Revisited", Insurance: Mathematics and Economics Congress, Atlanta. Aug, 2016.
2. Shapiro and Koissi, Speaker. "Assessing Health Risk with Soft Computing", Insurance: Mathematics and Economics Congress, University of Liverpool, United Kingdom. June 24-26, 2015.
3. Koissi and Shapiro, Speaker. "Using Fuzzy Logic to Model Risk: Case Studies", Actuarial Research Conference, University of California Santa Barbara, USA, July 13-16, 2014.
4. Koissi and Shapiro. Speaker. "Applying Fuzzy Optimization to Risk Assessment", 48th Actuarial Research Conference, Fox Business School, Temple University, PA, USA, August 2013.
5. Koissi and Shapiro. Speaker. "Credibility Theory in a Fuzzy Environment ", 47th Actuarial Research Conference, Warren Centre for Actuarial Studies and Research, University of Manitoba, Winnipeg, Canada, August 1-4, 2012.
6. Koissi and Shapiro. Poster Presentation. "The Lee-Carter Model under Variables Age-Specific Parameters". Population Association of America, San Francisco, CA, USA, May 3- 5, 2012.
7. Koissi and Shapiro. Speaker. "Fuzzy Regression, Diamond Distance, and the Term Structure of Interest Rates" . 43rd Actuarial Research Conference, University of Regina, SK, Canada. August 2008.
8. Koissi and Shapiro. Speaker. "The Lee-Carter model for mortality forecasting: more than 15 years later". 43rd Actuarial Research Conference, University of Regina, SK, Canada. August 2008.
9. Shapiro and Koissi. Speaker. "Detecting Fuzzy Predictor Variables: the Case of Insurer Solvency Surveillance in Germany." Insurance and Risk Theory Seminar, Terry College of Business, University Of Georgia, GA, USA. February 2008.
10. Koissi and Shapiro. Speaker. "Fuzzy Formulation of Lee-Carter Model." Insurance: Mathematics and Economics Congress, Quebec, Canada. July 2005.
11. Koissi, Shapiro, and Högnäs. Speaker. "Fitting and Forecasting Mortality in Nordic Countries with the Lee-Carter Model." 39th Actuarial Research Conference, Iowa, USA. August 2004.

12. Koissi and Högnäs. Speaker. “Bayesian analysis of family frailty in child survival data.” Nordic Conference on Mathematical Statistics, Jyväskylä, Finland. June 2004.
13. Koissi. Speaker. “Forecasting life expectancy in Finland: Lee-Carter model vs. Finnish insurance model.” Department of Statistics, University of Joensuu, Finland. October 2003.
14. Koissi. Poster. “Bayesian analysis of child mortality data from Ivory Coast.” European Population Conference, Warsaw, Poland. August 2003.
15. Koissi. Speaker. “Analysis of non parametric and parametric failure time models.” Department of Statistics, Åbo Akademi, Finland. March 2003.
16. Koissi and Högnäs. Speaker. “Parametric model for mortality projection, with application to insurance data.” Stochastic Analysis and Its Applications Conference, Laugarvatn, Iceland. August 2002.
17. Koissi and Högnäs. Speaker. “Stochastic models in population forecasting: a discussion of two approaches.” Nordic Conference on Mathematical Statistics, Stockholm, Sweden. June 2002.
18. Koissi and Högnäs. Speaker. “Forecasting mortality changes.” The Finnish Graduate School in Stochastics, Mekrijärvi, Finland. May 2001.

REFEREE

ACTIVITIES

- Since 2011: Journal of Risk and Insurance
- Since 2010: Computational Statistics and Data Analysis
- Since 2009: North American Actuarial Journal; Annals of Actuarial Science
- Since 2007: Lifetime Data Analysis.
- Since 2006: Populations Studies, Insurance Mathematics and Economics.

PROFESSIONAL MEMBERSHIPS

- International Association of Black Actuaries (IABA)
- The American Risk and Insurance Association (ARIA)

TECHNICAL SKILLS

- Competence in the use of various software
 - Statistical Software: SPSS, STATA, WinBUGS and R.
 - Mathematical Programming: MATLAB and MATHEMATICA.
- Analysis of Large Data (experience from health survey & a private life insurance company)
- Website design: html and alternative languages.

Teaching and Advising Experience Actuarial Science Program, University of Wisconsin, Eau Claire, WI, USA
[uwec] Courses taught Aug. 2014 – Present
 Math 346 – Introduction to Probability (SOA Probability Exam), Sp15
 Math 347 – Mathematical Statistics (CAS Exam S, partly) F15, F14
 Math 246 – Elementary Statistics F15, Sp15, F15

Students Research and Advising, UWEC Actuarial Science Program
 – Sp 2017: Koski Jordan “*Pricing mortality-linked securities, and extensions*”
 – Fall 2016: Adviser UWEC-Team-Minnesota Data Analytic Competition
 – 2016 – Ryan Stodola “*Predictive analysis of Big Data: appl. to S&P 500*”
 – 2015-2016: Alex Brown, “*Longevity Risk in Solvency Framework*”.
 – 2014-2015: Andrew Smeed, “*Modeling and Forecasting Mortality Rates*”.

Teaching and Advising Experience Department of Mathematics, Western Illinois University, Macomb, USA
[wiu] Courses taught Aug. 2007 – Jun. 2014

Math 699 – Life Contingencies (Independent Studies), Fall 11
 Math 599G – R for Statistical Computing, (New, Graduate) Summer 12
 Stat 490G – Actuarial Statistics, [New, SOA Probability exam] Fall 11
 Stat 409G – Probability and Statistics for Middle School Teachers. F13, Sp11
 Stat 171 – General Elementary Statistics. F13, Sp13, F12, Sum11

Math 411 – Non-Euclidean geometry Fall 10
 Math 407 – Number Theory Fall 12, Fall 08
 Math 406/475G – Problem Solving and the History of Math Spring 12
 Math 406G – Mathematical Reasoning Sp 10, Sp08
 Math 303 –Technology and Secondary School Mathematics F07, F09, F11
 Math 304 – Content Knowledge of Secondary School Mathematics Sp09
 Math 206 – Geometry for Elementary School Teachers. F11, Sp08, Sp09, Sp10
 Math 106 – Mathematics for Elementary School Teachers. F07, 08, 10, Sp11, 12

Students Research, WIU Dept of Mathematics

- 2013: Andrew Mansheim, “*Constructing Pi*”.
- 2012: McCreight, Farnesi, Wilkens, Hattula: “*The Golden Ratio*”
- 2012: Martin, Powell, Rednour: “*Archimedes and Volume formulas*”
- 2010&2011: Liu Shufang “*Non-Euclidean Geometry: Apollonian Circles*”
- 2009: Taewoong Kim “*Brownian Motion and Applications to Finances*”
- Master Thesis committee, f08: Abel Ochigbo, “Multi-step Method for ODE and Its Application to a Problem in Engineering”.

Teaching [Penn State] The Pennsylvania State University, Mont Alto campus, PA Sep. '06 – May '07
 Courses taught: Penn State University, Mont Alto.

Math 231: Calculus of Several Variables F2006
 Math 232: Integral Vector Calculus F2006
 Math 140&141: Calculus with Analytical Geometry I & II F2006 , Sp2007
 Math 110: Techniques of Calculus Sp2007, F2006

**Service
Activities**

University of Wisconsin, Eau Claire, WI, USA

Committees:

- University Senate (2015-2017)
- Academic Policy Committee (APC), 2015-2017
- Curriculum committee, Math Department (2015)

Western Illinois University, Macomb, IL:

- Statistics Committee (2007–2014)
- Math Education Committee: member, chair (2007-2014)
- University Technology Cabinet (2010 - 2012)

Pennsylvania State University, Mont Alto, PA:

- Campus Faculty Affairs Committee (2006-2007)

Other Skills

Languages: Bilingual in French and English,
Basic reading and understanding of Spanish, Swedish, and Finish.