2016

University of Piraeus
Department of Statistics & Insurance Science

`http://unipi.gr/stat/executive-seminar`

$$\int$$

$$\nabla$$

$$\ddot{\alpha}_{x:\overline{n}|}$$

$$\♩$$

$$\frac{\partial}{\partial x}$$

$$\sum$$

Executive Seminar
Actuarial Science - Risk Measures
& Topics on Solvency

Date: Friday, 7th of October 2016   **Time** 9:00 am

Invited Speakers

- **Hans Gerber** *(University of Lausanne)*

- **Marc Goovaerts** *(KULeuven)*

- **Jan Dhaene** *(KULeuven)*

- **Julia Eisenberg** *(University of Vienna)*

- **Ioannis Chatzivasiloglou** *(Bank of Greece)*

- **Alexia Alexiou** *(Interasco, S.A.G.I.)*

- **Apostolos Bozikas** *(University of Piraeus)*

- **Olivier Deprez** *(Pension Consultants, Zurich)*

Sponsored by the

Department of Statistics and Insurance Science
&   University of Piraeus Research Center

Organizing Committee

Georgios Pitselis (University of Piraeus) **Chairman**
Takis Papaioannou (University of Piraeus)
Matina Manolia (University of Piraeus)

University of Piraeus | 80 Karaoli & Dimitriou Str

Venue: University of Piraeus Conference Room

Date: 7 October 2016

Opening Time: 8:30 am

Free Admission

U N I V E R S I T Y   O F   P I R A E U S
DEPARTMENT OF STATISTICS AND INSURANCE SCIENCE

Actuarial and Risk Measures Executive Seminar
& Topics on Solvency

Entrance: University of Piraeus
Conference Room:
Date: Friday 7 of October   2016
Opening: 8:30

Program
From 8:45 to 14:00

Titles and abstracts

Marc Goovaerts
University   KULeuven

**From Esscher transforms to general Esscher-Girsanov
transforms for discrete-time processes**

We revisit the Esscher - Girsanov transform. Our contribution is two-fold. We introduce the version of the Esscher - Girsanov transform initially introduced in a setting of diffusion processes. We obtain an axiomatic definition of the real time Feynman path integrals.

Hans Gerber
University of Lausanne

A constraint-free approach to optimal reinsurance

Reinsurance is available for a reinsurance premium that is determined according to a convex premium principle H. The first insurer selects the reinsurance coverage that maximizes his expected utility. No conditions are imposed on the reinsurer's payment. The optimality condition involves the gradient of H. For several combinations of H and the first insurer's utility function, closed form formulas for the optimal reinsurance are given. If H is a zero utility principle (for example, an exponential principle or an expectile principle), it can be shown, with results from Pareto optimal risk exchanges and the Theorem of Borch, that the optimal reinsurer's payment satisfies the conditions that usually have to be imposed

Jan Dhaene
University KULeuven

Some thoughts on market valuation in a world with financial and actuarial risks.

Probability statements about future evolutions of financial and actuarial risks are expressed in terms of the 'real-world' probability measure P, whereas in an arbitrage-free environment, the prices of these traded risks can be expressed in terms of an equivalent martingale measure Q. The assumption of independence between financial and actuarial risks in the real world may be quite reasonable in many situations. Making such an independence assumption in the pricing world however, may be convenient but hard to understand from an intuitive point of view. In this pedagogical talk, we investigate the conditions under which it is possible (or not) to transfer the independence assumption from P to Q. In particular, we show that an independence relation that is observed in the P-world can often not be maintained in the Q-world.
A possible approach when it comes to choosing a particular pricing measure is to consider the one that is 'closest' to the physical probability measure P, where closeness is measured in terms of relative entropy. We determine the minimal entropy martingale measure in a market where securities are traded with payoffs depending on financial and actuarial risks, respectively. In case only purely financial and purely actuarial securities are traded, we prove that financial and actuarial risks are independent under the physical measure if and only if these risks are independent under the entropy measure. Moreover, in such a market the entropy measure of the combined financial-actuarial world is the product measure of the entropy measures of the financial and the actuarial subworlds, respectively.

Julia Eisenberg
University of Vienna

Some aspects of low interest rates in non-life insurance business.

Following the global financial crisis, short interest rates fell sharply in many countries, resulting even in negative rates in some European countries. One may believe that the changes in the interest rates mainly affect the life insurance branch, but economic and mathematical reports show that also non-life insurances suffer from the low interest rate environment. The valuation of a company requires discounting the future cash flow to the present. In order to manage sudden rises or drops in interest rates, also the non-life insurers might have to increase their premia or to shorten the dividend payments. In this talk we consider an insurance company using a constant, time varying or random discount rate. Our target is to find a strategy optimising cash flow management of the considered insurer.

Chatzivasiloglou Ioannis
Bank of Greece

Systemic risk in the insurance sector, financial stability and the macro-prudential tools of Solvency II

Systemic risk is defined by EU regulations as a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market of the EU and the real economy. As this risk is more evident today than ever in the past, a new paradigm shift is emerging related to macro-prudential policies and oversight, in contrast to the traditional, well known, micro-prudential measures and supervision. In this regard, marco-prudential policies are being designed for the prevention or mitigation of systemic risks to financial stability, so as to avoid periods of widespread financial distress and relevant macro-prudential tools are being developed. In this presentation, the connection of the financial stability with the insurance sector is presented and the crucial aspects of the quantitative methodologies used to measure financial stability are described. As a final step, the macro-prudential tools that are contained in Solvency II are described and the new terminology, such as long-term guaranty measures (LTG), matching adjustment (MA), volatility adjustment (VA), symmetric adjustment (SA) etc., is analyzed.

Alexia Alexiou
Interasco

Non-life risk valuation based on Solvency II

Solvency II is the new European directive that will reform capital requirements for life and non-life insurance undertakings. The evaluation of premium and reserve risk for non-life insurance undertakings will be presented. The standard model for calculating economic capital requirements, proposed by Solvency II, will be analyzed. An alternative model will be developed, in order to define company specific estimators for premium and reserve risk volatilities, as well as correlation coefficients between those risks and between lines of business. Basic principles of the Swiss Solvency Test will also be presented.

Apostolos Bozikas
University of Piraeus

On Mortality Modelling and Securitization of Longevity Risk: An Application to the Greek Population

Worldwide, the 20th century brought significant changes in mortality rates at all ages, for both males and females. Greece is a case in point, where the number of elderly has increased, implying an additional cost for pensions and medical care. In this paper, we incorporate the Greek population data for ages 60-94 within the years 1981-2010 into the Age-Period-Cohort modelling framework with the aim of comparing the fitting and forecasting performance of seven stochastic mortality models. The securitization of longevity risk is also described and pricing methods for mortality bonds are illustrated. Conclusions are drawn about future mortality trends and the important role the government should play in order to manage the longevity risk.

Olivier Deprez
Deprez Pension Consultants Zurich, Switzerland

Differences and similarities between the mandatory Swiss Occupational Benefits System and the Swedish National Inkomstpension System

The presentation compares the mandatory occupational pension systems of Switzerland and Sweden. In both, an insured earns credits on a personal account during the active life. At retirement, the accumulation is converted into a pension. But the two systems are substantially different: the Swiss system is essentially a fully funded defined contribution scheme. In contrast, the Swedish system is a NDC (notional defined contribution), where the funding is essentially on a pay-as-you-go basis.

Detailed program: TBA – Θα ανακοινωθεί σύντομα

Free Admission (Είσοδος Ελεύθερη)

Δεν χρειάζεται δήλωση συμμετοχής