WEDNESDAY
FEBRUARY 2

9:00 – 10:30  “Modeling Illiquid Financial Markets”
Peter Bank
Universidad Técnica de Berlín

Standard asset price models used in Mathematical Finance are built on the assumption that the devised strategies do not affect the price of these assets. While this assumption is valid in many cases, it becomes dubious in situation where trade sizes become so large that they are no longer easily covered by market liquidity or when market liquidity is low. We will describe and discuss a number of models put forward in the literature. For the analysis of these models we will develop and apply some mathematical results from Stochastic Analysis as well as a bit of economics, most notably General Equilibrium Theory.

10:30 – 10:45  Coffee

Irina Penner
Universidad Humboldt de Berlín

Risk measures quantify undertaken risk in terms of minimum capital reserves, which should be maintained in order to ensure financial stability. We will give an overview of the theory of convex risk measures in the dynamic environment, where risk assessment is updated over the time in accordance with the new information. In particular we will discuss various time consistency aspects of dynamic risk assessment, and we will show how uncertainty about the time value of money can be taken into account.

12:15 – 12:30  Coffee

12:30 – 13:15  “Independent Component Analysis (ICA) for Extracting Underlying Systematic Risk Factors”
Rogelio Ladrón de Guevara* and Salvador Torra Porras
Universidad Veracruzana

In this paper we try to uncover a more realistic latent systematic risk factor structure by means of the Independent Component Analysis (ICA), in order to find out whether the statistical approach of the Arbitrage Pricing Theory (APT) performs better on the Mexican Stock Exchange, using the betas extracted via this novel and more appropriate technique for parallel and non-Gaussian financial time series. In order to ensure the correct performance of ICA and to demonstrate that the extraction of betas by classic multivariate techniques such as Principal Components Analysis (PCA) and Factor Analysis (FA) may not be very reliable, we tested the univariate and multivariate non-Gaussianity of the data, using the Jarque-Bera test for univariate normality and the Mardia, and Henze-Zirkler tests for multivariate normality. We estimated the ICA model by means of the FastICA algorithm and
considered the mixing matrix \( A \) as betas. We used three different criteria to sort the extracted independent components: Kurtosis, Euclidean norm, and Infinity norm. We performed the econometric contrast of the APT considering an average cross-sectional methodology and estimating the parameters by Ordinary Least Squares. Although the reconstruction of the original returns using our ICA model estimation was perfect, the evidence we found showed mixed results in the fit of the APT model. Only seven models fitted perfectly fulfilling all the restrictions revealing the existence of from two to eight priced underlying factors. The rest of the significant models failed in the fulfilling of the independent term restriction.

13:15 – 14:00  
“Mortality Risk. A Stochastic Approach”  
Gerardo Rubio Hernández  
Comisión Nacional de Seguros y Fianzas

Life insurance and pensions present two main kind of risks: specific or unsystematic risk and systematic risk. The first one is referred to the risk that the mortality of an specific policyholder differs from the population's mortality. As a consequence of the law of large numbers, this risk is diversified away for a sufficiently large portfolio of insureds. The second one, systematic risk, is referred as the risk that aggregate mortality trends might differ from those anticipated from the observed evolution in the past. That is, this risk considers a deviation of the whole mortality table. Because of this, systematic risk cannot be diversified away by an increasing number of insureds within an insurer's portfolio. Traditionally, insurance companies face these deviations loading the mortality towards the safe side. Another way of dealing with systematic risk is considering a stochastic model for the evolution of the force of mortality. In this talk we'll present a stochastic mortality model based on similar principles as those from interest rate and credit risk theory. We'll give a brief view of the methodology used for the theoretical setup, the calibration and finally the implementation of our model.

14:00 – 15:30  
Lunch

15:30 – 16:15  
"Exchangeable Claim Sizes in a Compound Poisson-type Process”  
Ramsés H. Mena Chávez  
IIMAS - UNAM

When dealing with risk models the typical assumption of independence among claim size distributions is not always satisfied. Here we consider the case when the claim sizes are exchangeable and study the implications when constructing aggregated claims through compound Poisson type processes. In particular, exchangeability is achieved through conditional independence, using parametric and nonparametric measures for the conditioning distribution. Bayes' Theorem is employed to ensure an arbitrary but fixed marginal distribution for the claim sizes. A full Bayesian analysis of the proposed model is illustrated with a some real data sets.

16:15 – 16:35  
"Do Financial Returns Have Finite or Infinite Variance? A Paradox and an Explanation"  
Michael Grabchak* and Gennady Samorodnitsky  
Cornell University
One of the major points of contention in studying and modelling financial returns is whether or not the variance of the returns is finite or infinite (sometimes referred to as the Bachelier–Samuelson Gaussian world versus the Mandelbrot stable world). A different formulation of the question asks how heavy the tails of the financial returns are. The available empirical evidence can be, and has been, interpreted in more than one way. The apparent paradox, which has puzzled many a researcher, is that the tails appear to become less heavy for less frequent (e.g. monthly) returns than for more frequent (e.g. daily) returns, a phenomenon not easily explainable by the standard models. Inspired by the prelimit theorems of Klebanov, Rachev and Szekely (1999) and Klebanov, Rachev and Safarian (2000), we provide an explanation of this paradox. We show that, for financial returns, a natural family of models are those with tempered heavy tails. These models can generate observations that appear heavy tailed for a wide range of aggregation levels before becoming clearly light tailed at even larger aggregation scales. Important examples demonstrate the existence of a natural scale associated with the model at which such an apparent shift in the tails occurs.

16:35 – 16:55  Welcome Reception

THURSDAY
FEBRUARY 3

9:00 – 10:30  “Modeling Illiquid Financial Markets”
Peter Bank
Universidad Técnica de Berlín

10:30 – 10:45  Coffee

Irina Penner
Universidad Humboldt de Berlín

12:15 – 12:30  Coffee

Carlos Trejo Pech*, Universidad Panamericana – Guadalajara
Ángel Samaniego Alcántar, ITESO, Guadalajara

Sloan (1996) analyzes the U.S. market from 1962 to 1991, and documents a systematic relationship between current period’s accruals and future period’s stock returns. He further argues that few investors pay attention to this relationship, opening the possibility for arbitrage. This possibility of arbitrage is termed the accrual anomaly in the financial and accounting economics literature.

Several studies have replicated, extended, and challenged the accrual anomaly. However, a complete explanation for this problem has yet to be provided. Khan (2008), (pp72), illustrates the importance of this research problem:

“[The accrual anomaly] is especially troubling because it implies that the market misunderstands a reported financial accounting number… It is hard to imagine how a number that is misunderstood could be very useful"
We are interested in the stream of research that examines the accrual anomaly in countries other than in the U.S. LaFond (2005); Pincus, Rajgopal and Venkatachalam (2007); and Kaserer and Klingler (2008) have investigated the accrual anomaly in an international context but none of these studies have investigated the accrual anomaly in Latin American countries. In particular our focus studies on the Mexican Stock Exchange from 1990 to 2009. The Capital Asset Pricing Model (CAPM) and the three-factors model by Fama and French (1993) are used as the main frameworks to analyze this problem. Whether the two methodologies capture correctly the risk-return relationship in the Mexican Stock Exchange is discussed.

13:15 – 14:00 “Institutions and the Labor Market Performance: An Equilibrium Search Approach”
Coralia Quintero Rojas
Universidad de Guanajuato

Europeans have worked less than Americans since the 1970s. How much of this difference is accounted by the labor market institutions? We deal with this question at two levels. First, we quantify the relative importance of the extensive and intensive margins of aggregate hours of market work on the observed differences. Our counterfactual exercises show that the two dimensions of the extensive margin, the employment rate and the participation rate, explain the most of the total-hours-gap between regions. Moreover, both ratios have similar weight. Conversely, the intensive margin, measured by the number of hours worked per employee, has the smallest role.

Next, we propose a theoretical explanation to the observed trends in the two margins of the aggregate hours of work. To this end we develop a search and matching economy à la Pissarides that then we use as laboratory to conduct several quantitative experiences using an accounting method. From a transatlantic perspective, our findings support the view that the main distortion in the US economy is a constant labor tax wedge, whereas in the European labor markets the distortions come from the shifts in both labor market institutions and tax wedges.

14:00 – 15:30 Lunch

15:30 – 16:15 “Default and Fragility in the Payment System”
Scott Freeman, University of Texas at Austin
Paula Hernández-Verme*, Universidad de Guanajuato

We present a model of the payment system where agents may choose whether or not to default on debt. Our model also features debt-financed purchases of goods, unsecured debt cleared through third parties, and debt settlement requiring final payment using fiat money. We compare the merits of three alternative settlement rules: a strict net settlement rule, a net settlement rule with debt forgiveness and a gross settlement rule. We find that net settlement is superior to gross settlement and that only a net settlement rule with debt forgiveness gives the correct incentives for a unique, stable and optimal stationary equilibrium.

JEL classification: E44, E52, E58

Keywords: Endogenous default; finality; financial fragility; gross settlement; inside money; multiple equilibria; net settlement; payments system; stability of equilibria; strategic complementarities.
16:15 – 16:35  "Un Modelo para la Valuación de Deuda Corporativa"
René Welch Schwartz
Proveedor Integral de Precios, S.A. de C.V.

En este artículo se presenta una nueva metodología construida a partir de los usos y costumbres del mercado mexicano y los resultados de algunas pruebas que se hicieron para probar su funcionamiento. Asimismo se presentan los antecedentes en la valuación de este universo de instrumentos, los principios utilizados y los supuestos considerados para la implementación de esta metodología. Finalmente se presentan los resultados obtenidos a partir de un breve backtest de esta nueva metodología.

16:35 – 16:55  "Generating Covariances in Multifactor CIR Model"
Wojciech Szatzschneider
Universidad Anáhuac México Norte

Some calculations of covariances can be found in multifactor CIR model in the case of dependent factors, or between riskless rate and intensity of default. This kind of modeling appears, for example, in Schonbucher’s textbook. However, these covariances can only have reduced range; for example, can not be polynomial of grade larger than two. This can be proved using comparison theorems for diffusions or, for some functions the impossibility of such modeling can be obtained using elementary but tricky calculations. We consider that the inverse problem is of greater importance, meaning that given covariances, model that generates them should be constructed.

As mentioned, this problem has no solution within CIR framework. We prove that given any covariances (even negative) extended CIR multifactor model with precisely these covariances can be build, and explicit calculation of bond prices is still possible. The easiest way of such modeling for positive covariances is by adding BESQ processes multiplied by time functions, and taking advantage of solutions of corresponding Sturm-Liouville equations for large enough family of functions. We also explore other possibilities for special choices of time dependent drifts. In the case of negative covariances we believe that corresponding modeling has to be reduced to n-dimensional BESQ processes (if explicit solutions for bond prices are required), driven by different Brownian Motions, and once again multiplied by time functions. All calculations use heavily exponential martingales.

FRIDAY
FEBRUARY 4

9:00 – 10:30  “Modeling Illiquid Financial Markets”
Peter Bank
Universidad Técnica de Berlín

10:30 – 10:45  Coffee

Irina Penner
Universidad Humboldt de Berlín

12:15 – 12:30  Coffee
Víctor Manuel Fenton Navarro
Banco del Bajío

In the conference the speaker will talk about several historical moments in time when financial bubbles have occurred. There will be some reflections on the personal and communitarian behavior that undervalues the probability of occurrence of some shocking market events and a few advices on risk mitigating actions will be given.

13:15 – 14:00 “Systemic Risk, Stress Testing and Financial Contagion: Their Interaction and Measurement”
Serafín Martínez Jaramillo
Banco de México

Despite the acknowledgement of the relevance of Systemic Risk, there is a lack of consensus on its definition and more importantly, on the way it should be measured. Fortunately, there is a growing research agenda and more financial regulators, central bankers and academics are contributing to this field recently.

In this work, we obtain a distribution of losses for the banking system as a whole. We are convinced that such distribution of losses is the key element that could be used to develop relevant measures for systemic risk.

Our model contemplates several aspects which we consider important in the concept of systemic risk: an initial macroeconomic shock which weakens some institutions (some of them to the point of failure), a contagion process by means of the interbank market and the resulting losses to the financial system as a whole. Finally, once the distribution is estimated, we can derive standard risk measures for the system as a whole, focusing on the tail of the distribution (where the catastrophic or systemic events are located).

By using this proposed framework, it is also possible to perform stress testing in a coherent way, including second round effects like contagion through the interbank market. Additionally, it is possible to follow the evolution of certain coherent risk measures like the CVaR in order to evaluate if the system is becoming more or less risky, in fact, more or less fragile.

Additionally, we can decompose the distribution of losses of the whole banking system into the systemic and the contagion elements and we can determine if the system is more prone to experience contagious difficulties during a certain period of time.

14:00 – 15:30 Lunch

15:30 – 16:15 "Las Finanzas en México: se Necesitan Matemáticos"
Esteban Martina Boggetto
UAM – I, Pro Consulting Partners

Se hace un breve resumen del desarrollo de las Finanzas en México, especialmente en instituciones financieras y se discuten los problemas que han surgido en la valuación, riesgo, formación de carteras, etc. y cómo se ha tratado de resolverlos. Se presentan
algunos resultados para precios que podrían ser útiles como una herramienta de caracterización.

16:15 – 16:55  
"Capital Económico por Riesgo Operacional: Enfoque Práctico"
Fernando González
Fermac Risk, SL

Enfoque avanzado de medición, Loss Distribution Approach (LDA), para la estimación del Capital Económico por riesgo operacional. Determinación paramétrica de las distribuciones de frecuencia y severidad que definen el modelo, incluyendo enfoque bayesiano. Estimación de pérdida agregada con simulación de Montecarlo, algoritmo recursivo Panjer y Fast Fourier Transformation. Utilización de correlación y copulas entre las distintas clases de riesgo operacional y unidades de negocio. Interpretación de resultados de capital económico y pérdida esperada.

 Ejemplos en SAS, Matlab y Excel.
Risk Analysis in Economics and Finance has been sponsored by CIMAT and the University of Guanajuato.

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