

Journals Review:

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Description

The purpose of Finance and Stochastics is to provide a high standard publication forum for research

- in all areas of finance based on stochastic methods
- on specific topics in mathematics (in particular probability theory, statistics and stochastic analysis) motivated by the analysis of problems in finance.

Finance and Stochastics encompasses - but is not limited to - the following fields:

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 - statistical and empirical financial studies based on advanced stochastic methods
 - numerical and stochastic solution techniques for problems in finance
 - intertemporal economics, uncertainty and information in relation to finance.
- Finance and Stochastics also publish surveys on financial topics of general interest if they clearly picture and illuminate the basic ideas and techniques at work, the interrelationship of different approaches and the central questions which remain open. Special issues may be devoted to specific topics in rapidly growing research areas.

In summary, Finance and Stochastics serve as a publication platform for both theoretical and applied financial economists using advanced stochastic methods and researchers in stochastics motivated by and interested in applications in finance and insurance.

Volume 10, Number 1 / January, 2006

Gianluca Fusai, I. David Abrahams and Carlo Sgarra, An exact analytical solution for discrete barrier options, pages 1-26

Abstract: In the present paper we provide an analytical solution for pricing discrete barrier options in the Black-Scholes framework. We reduce the valuation problem to a Wiener-Hopf equation that can be solved analytically. We are able to give explicit expressions for the Greeks of the contract. The results from our formulae are compared with those from other numerical methods available in the literature. Very good agreement is obtained, although evaluation using the present method is substantially quicker than the alternative methods presented.

Keywords: Barrier options - discrete monitoring - Wiener-Hopf equation - Black-Scholes - z-transform

Anastasia Kolodko and John Schoenmakers, Iterative construction of the optimal Bermudan stopping time, pages 27-49

Abstract: We present an iterative procedure for computing the optimal Bermudan stopping time, hence the Bermudan Snell envelope. The method produces an increasing sequence of approximations of the Snell envelope from below, which coincide with the Snell envelope after finitely many steps. Then, by duality, the method induces a convergent sequence of upper bounds as well. In a Markovian setting the presented procedure allows to calculate approximative solutions with only a few nestings of conditional expectations and is therefore tailor-made for a plain Monte Carlo implementation. The method may be considered generic for all discrete optimal stopping problems. The power of the procedure is demonstrated for Bermudan swaptions in a full factor LIBOR market model.

Keywords: Bermudan options - optimal stopping - Monte Carlo simulation - LIBOR market model

R. Tyrrell Rockafellar, Stan Uryasev and Michael Zabarankin, Generalized deviations in risk analysis, pages 51-74

Abstract: General deviation measures are introduced and studied systematically for their potential applications to risk management in areas like portfolio optimization and engineering. Such measures include standard deviation as a special case but need not be symmetric with respect to ups and downs. Their properties are explored with a mind to generating a large assortment of examples and assessing which may exhibit superior behavior. Connections are shown with coherent risk measures in the sense of Artzner, Delbaen, Eber and Heath, when those are applied to the difference between a random variable and its expectation, instead of to the random variable itself. However, the correspondence is only one-to-one when both classes are restricted by properties called lower range dominance, on the one hand, and strict expectation boundedness on the other. Dual characterizations in terms of sets called risk envelopes are fully provided.

Keywords: Risk management - deviation measures - coherent risk measures - value-at-risk - conditional value-at-risk - portfolio optimization - convex analysis

Peter Holm Nielsen, Utility maximization and risk minimization in life and pension insurance, pages 75-97

Abstract: We consider a life insurance company that seeks to optimize the pension benefits on behalf of an insured. We take the uncertain course of life of the insured explicitly into account and thus have a non-standard financial optimization problem for which we propose a two-step approach. First, according to a certain preference structure and under a certain fairness constraint, an optimal pension payment process is obtained. This leaves the company with a non-hedgeable liability, for which we then discuss two quadratic hedging approaches. We obtain general results on dividend optimization, indicating that some widely used strategies are suboptimal, and semi-explicit expressions for the optimal bonus and investment strategies.

Keywords: Participating life insurance - dividends - bonus - investment strategies - optimization - risk minimization

Gordan Žitković, Financial equilibria in the semimartingale setting: Complete markets and markets with withdrawal constraints, pages 99-119

Abstract: Existence of stochastic financial equilibria giving rise to semimartingale asset prices is established under a general class of assumptions. These equilibria are expressed in real terms and span complete markets or markets with withdrawal constraints. We deal with random endowment density streams which admit jumps and general time-dependent utility functions on which only regularity conditions are imposed. As an integral part of the proof of the main result, we establish a novel characterization of semimartingale functions.

Keywords: financial equilibrium - complete markets - semimartingales - semimartingale functions - withdrawal constraints

Koichi Matsumoto, Optimal portfolio of low liquid assets with a log-utility function, pages 121-145

Abstract: In the real market an asset is not completely liquid. An investor should plan a strategy on the grounds that an asset cannot always be traded. In this paper we consider the classical Merton wealth problem, but the risky asset is not completely liquid. The liquidity is represented by the success rate of the trade and the investor can trade the asset at distributed exponentially random times. We find the value function and exhibit a procedure for an asymptotic expansion of the optimal strategy. Further we reveal some characteristics of the optimal strategy by a numerical analysis.

Keywords: Portfolio optimization - liquidity - log-utility function

Patrick Cheridito and Christopher Summer, Utility maximization under increasing risk aversion in one-period models, pages 147-158

Abstract: It has been shown at different levels of generality that under increasing risk aversion utility indifference sell prices of a contingent claim converge to the super-replication price and the shortfalls of utility maximizing hedging portfolios starting from the super-replication price tend to zero in L^1 .

In this paper we give an example of a one-period financial model with bounded prices where utility optimal strategies and terminal wealths stay bounded but do not converge when the risk aversion is going to infinity. Then we give general results on the behavior

of utility maximizing strategies and terminal wealths under increasing risk aversion in one-period models. The concept of a balanced strategy turns out to play a crucial role.

Volume 10, Number 2 / April, 2006

Paolo Guasoni, Asymmetric Information in Fads Models, pages 159-177

Abstract: Fads models were introduced by Shiller (*Am Econ Rev* 71:421–436, 1981) and Summers (*J Finance* 41:591–601, 1986) as plausible alternatives to the efficient markets/constant expected returns assumptions. Under these models, logarithms of asset prices embody both a martingale component, with permanent shocks, and a stationary component, with temporary shocks. We study a continuous-time version of these models both from the point of view of informed agents, who observe both fundamental and market values, and from that of uninformed agents, who only observe market prices. We specify the asset price in the larger filtration of the informed agent, and then derive its decomposition in the smaller filtration of the uninformed agent using the Hitsuda representation of Gaussian processes. For uninformed agents we obtain a non-Markovian dynamics, which justifies the use of technical analysis in optimal trading strategies. For both types of agents, we solve the problem of maximization of expected logarithmic utility from terminal wealth, and obtain an explicit formula for the additional logarithmic utility of informed agents. Finally, we apply the decomposition result to the problem of testing the presence of fads from market data. An application to the NYSE-AMEX indices from the CRSP database shows that, if the fads component prevails, then the mean-reversion speed must be slow.

Keywords: Ornstein–Uhlenbeck - Hitsuda representation - Fads models - Asymmetric information

Hans Buehler, Consistent Variance Curve Models, pages 178-203

Abstract: We introduce a general approach to model a joint market of stock price and a term structure of variance swaps in an HJM-type framework. In such a model, strongly volatility-dependent contracts can be priced and risk-managed in terms of the observed stock and variance swap prices. To this end, we introduce equity forward variance term structure models and derive the respective HJM-type arbitrage conditions. We then discuss finite-dimensional Markovian representations of the fixed time-to-maturity forward variance swap curve and derive consistency results for both the standard case and for variance curves with values in a Hilbert space. For the latter, our representation also ensures non-negativity of the process. We then give a few examples of such variance curve functionals and briefly discuss completeness and hedging in such models. As a further application, we show that the speed of mean reversion in some standard stochastic volatility models should be kept constant when the model is recalibrated.

Keywords: Variance swaps - Options on variance - Market models - Arbitrage-free term structure dynamics - Heath–Jarrow–Morton theory - Consistent parametrizations

E. Chevalier, Optimal Early Retirement Near the Expiration of a Pension Plan, pages 204-221

Abstract: In a recent paper, Friedman and Shen (*Finance Stoch* 6: 273–302, 2002) have considered a pension plan with the option of early retirement. They showed that the

financial value V of the retirement benefits is the solution of a variational inequality and have studied the associated free boundary. A description of the free boundary near maturity is given, thanks to integral equation methods. However, V is also the solution of an optimal stopping problem very close to the American option valuation problem. Comparing V to specific options, we derive an expansion of the free boundary near the expiration of the pension plan.

Keywords: Free boundary - Optimal stopping - Variational inequality

Jan Bergenthum and Ludger Rüschendorf, Comparison of Option Prices in Semimartingale Models, pages 222-249

Abstract: In this paper we generalize the recent comparison results of El Karoui et al. (Math Finance 8:93–126, 1998), Bellamy and Jeanblanc (Finance Stoch 4:209–222, 2000) and Gushchin and Mordecki (Proc Steklov Inst Math 237:73–113, 2002) to d -dimensional exponential semimartingales. Our main result gives sufficient conditions for the comparison of European options with respect to martingale pricing measures. The comparison is with respect to convex and also with respect to directionally convex functions. Sufficient conditions for these orderings are formulated in terms of the predictable characteristics of the stochastic logarithm of the stock price processes. As examples we discuss the comparison of exponential semimartingales to multivariate diffusion processes, to stochastic volatility models, to Lévy processes, and to diffusions with jumps. We obtain extensions of several recent results on nontrivial price intervals. A crucial property in this approach is the propagation of convexity property. We develop a new approach to establish this property for several further examples of univariate and multivariate processes.

Keywords: Contingent claim valuation - Semimartingale model - Price orderings - Propagation of convexity

Robert J. Elliott and Carlton-James U. Osakwe, Option Pricing for Pure Jump Processes with Markov Switching Compensators, pages 250-275

Abstract: This paper proposes a model for asset prices which is the exponential of a pure jump process with an N -state Markov switching compensator. We argue that such a process has a good chance of capturing all the empirical stylized regularities of stock price dynamics and we provide a closed form representation of its characteristic function. We also provide a parsimonious representation of the (not necessarily unique) risk neutral density and show how to price and hedge a large class of options on assets whose prices follow this process.

Keywords: Jump process - Markov switching - Compensator - Characteristic function - European options - Hedging

Bruno Bouchard, No-arbitrage in Discrete-time Markets with Proportional Transaction Costs and General Information structure, pages 276-297

Abstract: We discuss the no-arbitrage conditions in a general framework for discrete-time models of financial markets with proportional transaction costs and general information structure. We extend the results of Kabanov et al. (Finance Stoch 6(3):371–382, 2002; Finance Stoch 7(3):403–411, 2003) and Schachermayer (Math Finance 14(1):19–48, 2004) to the case where bid-ask spreads are not known with

certainty. In the “no-friction” case, we retrieve the result of Kabanov and Stricker (Preprint 2003). Additionally, we propose a new modelization based on simple orders which appears to be powerful whatever the information structure is.

Keywords: Absence of arbitrage - Proportional transaction costs - Imperfect information - Optional projection

Lothar Rogge, Call Completeness Implies Completeness in the n-period Model of a Financial Market, pages 298-301

Abstract: In this paper an arbitrage-free n-period model of a financial market with a predictable, strictly positive numéraire and g risky assets is considered. Complete financial markets are of great practical relevance and of considerable theoretical interest, because in these markets one can find hedging strategies and unique arbitrage-free prices. In this paper complete financial markets are characterized by the simple condition of “call-completeness”.

Keywords: n-period model of a financial market - Complete markets

Volume 10, Number 3 / September, 2006

Peter Carr and Vadim Linetsky, A jump to default extended CEV model: an application of Bessel processes, pages 303-330

Abstract: We develop a flexible and analytically tractable framework which unifies the valuation of corporate liabilities, credit derivatives, and equity derivatives. We assume that the stock price follows a diffusion, punctuated by a possible jump to zero (default). To capture the positive link between default and equity volatility, we assume that the hazard rate of default is an increasing affine function of the instantaneous variance of returns on the underlying stock. To capture the negative link between volatility and stock price, we assume a constant elasticity of variance (CEV) specification for the instantaneous stock volatility prior to default. We show that deterministic changes of time and scale reduce our stock price process to a standard Bessel process with killing. This reduction permits the development of completely explicit closed form solutions for risk-neutral survival probabilities, CDS spreads, corporate bond values, and European-style equity options. Furthermore, our valuation model is sufficiently flexible so that it can be calibrated to exactly match arbitrarily given term structures of CDS spreads, interest rates, dividend yields, and at-the-money implied volatilities.

Keywords: Default - Credit spread - Corporate bonds - Equity derivatives - Credit derivatives - Implied volatility skew - CEV model - Bessel processes

David Heath and Hyejin Ku, Consistency among trading desks, pages 331-340

Abstract: We consider a bank having several trading desks, each of which trades a different class of contingent claims with each desk using a different model. We assume that the models are arbitrage-free. A practical question is whether a bank using several models can be arbitrated. Surprisingly it can happen that in some cases there must be an arbitrage. We discuss conditions under which the bank trades without offering arbitrage.

Keywords: Arbitrage - Pricing operator - Countably additive measure - Martingale measure

Paul Embrechts and Giovanni Puccetti, Bounds for Functions of Dependent Risks, pages 341-352

Abstract: The problem of finding the best-possible lower bound on the distribution of a non-decreasing function of n dependent risks is solved when $n=2$ and a lower bound on the copula of the portfolio is provided. The problem gets much more complicated in arbitrary dimensions. When no information on the structure of dependence of the random vector is available, we provide a bound on the distribution function of the sum of risks which we prove to be better than the one generally used in the literature.

Keywords: Copulas - Dependent risks - Dependence bounds - Fréchet bounds

Elisa Alòs, A generalization of the Hull and White formula with applications to option pricing approximation, pages 353-365

Abstract: By means of Malliavin calculus we see that the classical Hull and White formula for option pricing can be extended to the case where the volatility and the noise driving the stock prices are correlated. This extension will allow us to describe the effect of correlation on option prices and to derive approximate option pricing formulas.

Keywords: Continuous-time option pricing model - Stochastic volatility - Malliavin calculus

A. S. Cherny, Weighted $V@R$ and its Properties, pages 367-393

Abstract: The paper deals with the study of a coherent risk measure, which we call Weighted $V@R$. It is a risk measure of the form

$$\rho_{\mu}(X) = \int_{[0,1]} TV@R_{\lambda}(X) \mu(d\lambda),$$

where μ is a probability measure on $[0,1]$ and $TV@R$ stands for Tail $V@R$. After investigating some basic properties of this risk measure, we apply the obtained results to the financial problems of pricing, optimization, and capital allocation. It turns out that, under some regularity conditions on μ , Weighted $V@R$ possesses some nice properties that are not shared by Tail $V@R$. To put it briefly, Weighted $V@R$ is “smoother” than Tail $V@R$. This allows one to say that Weighted $V@R$ is one of the most important classes (or maybe the most important class) of coherent risk measures.

Keywords: Capital allocation - Coherent risk measures - Determining set - Distorted measures - Minimal extreme measure - No-good-deals pricing - Spectral risk measures - Strict diversification - Tail $V@R$ - Weighted $V@R$

Hiroaki Hata and Yasunari Iida, A risk-sensitive stochastic control approach to an optimal investment problem with partial information, pages 395-426

Abstract: We consider an infinite time horizon optimal investment problem where an investor tries to maximize the probability of beating a given index. From a mathematical viewpoint, this is a large deviation probability control problem. As shown by Pham (in Syst. Control Lett. 49: 295–309, 2003; Financ. Stoch. 7: 169–195, 2003), its dual problem can be regarded as an ergodic risk-sensitive stochastic control problem. We discuss the partial information counterpart of Pham (in Syst. Control Lett. 49: 295–309, 2003; Financ. Stoch. 7: 169–195, 2003). The optimal strategy and the value function for the dual problem are constructed by using the solution of an algebraic Riccati equation. This equation is the limit equation of a time inhomogeneous Riccati equation derived

from a finite time horizon problem with partial information. As a result, we obtain explicit representations of the value function and the optimal strategy for the problem. Furthermore we compare the optimal strategies and the value functions in both full and partial information cases.

Patrick Cheridito, Freddy Delbaen and Michael Kupper, Coherent and convex monetary risk measures for unbounded càdlàg processes, pages 427-448

Abstract: Assume that the random future evolution of values is modelled in continuous time. Then, a risk measure can be viewed as a functional on a space of continuous-time stochastic processes. In this paper we study coherent and convex monetary risk measures on the space of all càdlàg processes that are adapted to a given filtration. We show that if such risk measures are required to be real-valued, then they can only depend on a stochastic process in a way that is uninteresting for many applications. Therefore, we allow them to take values in $(-\infty, \infty]$. The economic interpretation of a value of ∞ is that the corresponding financial position is so risky that no additional amount of money can make it acceptable. The main result of the paper gives different characterizations of coherent or convex monetary risk measures on the space of all bounded adapted càdlàg processes that can be extended to coherent or convex monetary risk measures on the space of all adapted càdlàg processes. As examples we discuss a new approach to measure the risk of an insurance company and a coherent risk measure for unbounded càdlàg processes induced by a so called m-stable set.

Keywords: Coherent risk measures - Convex monetary risk measures - Coherent utility functionals - Concave monetary utility functionals - Unbounded càdlàg processes - Extension of risk measures

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Catherine Kyrtsov, Alexandros Leontitsis and Costas Siriopoulos, Exploring the impact of calendar effects on the dynamic structure and forecasts of financial time series, pages 1-22

Abstract: Several recently developed chaotic forecasting methods give better results than the random walk forecasts. However they do not take into account specific regularities of stock returns reported in empirical finance literature, such as the calendar effects. In this paper, we present a method for filtering the day-of-the-week and the holiday effect in a time series. Our main objective is twofold. On the one hand we study how the underlying dynamics of the Nasdaq Composite, and TSE 300 Composite returns series can be influenced by the presence of calendar effects. On the other hand we adapt our method to chaotic forecasting. Its computational advantages lead to significant improvements of forecasts.

Fathi Abid and Nader Naifar, The determinants of credit default swap rates: an explanatory study, pages 23-42

Abstract: The aim of this paper is to explain empirically the determinants of credit default swap rates using a linear regression. We document that the majority of variables, detected from the credit risk pricing theories, explain more than 60% of the total level of credit default swap. These theoretical variables are credit rating, maturity, riskless interest rate, slope of the yield curve and volatility of equities. The estimated coefficients for the majority of these variables are consistent with theory and they are significant both statistically and economically. We conclude that credit rating is the most determinant of credit default swap rates.

Thorsten Schmidt, An infinite factor model for credit risk, pages 43-68

Abstract: The defaultable term structure is modeled using stochastic differential equations in Hilbert spaces. This leads to an infinite dimensional model, which is free of arbitrage under a certain drift condition. Furthermore, the model is extended to

incorporate ratings based on a Markov chain.

Sergio Albeverio, Alex Popovici and Victoria Steblovskaya, A numerical analysis of the extended black-scholes model, pages 69-90

Abstract: In this article some numerical results regarding the multidimensional extension of the Black–Scholes model introduced by Albeverio and Steblovskaya [1] (a multidimensional model with stochastic volatilities and correlations) are presented. The focus lies on aspects concerning the use of this model for the practice of financial derivatives. Two parameter estimation methods for the model using historical data from the market and an analysis of the corresponding numerical results are given. Practical advantages of pricing derivatives using this model compared to the original multidimensional Black–Scholes model are pointed out. In particular the prices of vanilla options and of implied volatility surfaces computed in the model are close to those observed on the market.

Anton Bovier, Jiri Černý And Ostap Hryniv, The opinion game: stock price evolution from microscopic market modeling, pages 91-112

Abstract: We propose a class of Markovian agent based models for the time evolution of a share price in an interactive market. The models rely on a microscopic description of a market of buyers and sellers who change their opinion about the stock value in a stochastic way. The actual price is determined in realistic way by matching (clearing) offers until no further transactions can be performed. Some analytic results for simple special cases are presented. We also propose basic interaction mechanisms and show in simulations that these already reproduce certain particular features of prices in real stock markets.

Junichi Hirukawa, Cluster analysis for non-Gaussian locally stationary processes, pages 113-132

Abstract: Time series analysis under stationary assumption has been well established. However, stationary time series models are not plausible to describe the real world. Indeed, relatively long stretches of time series data should contain either slow or rapid changes in the spectra. To develop a general non-stationary theory, we have to pay careful attention to constituting a suitable model, otherwise the observations obtained in the future give no information about the present structure. Dahlhaus [1–4] has introduced an important class of non-stationary processes, called locally stationary processes which have the time varying spectral densities. In this paper, for a clustering problem of stock returns in Tokyo Stock Exchanges, we propose nonparametric approach based on generalized integral functional measures of the time varying spectral densities. The generalized measures include Gaussian Kullback–Leibler information and Chernoff information measures. The clustering results well extract the features of the relationship among the companies.

Serpil Canbas, Yildirim B. Onal, Hatice G. Duzakin and Suleyman B. Kilic, Prediction of financial distress by multivariate statistical analysis: the case of firms taken into the surveillance market in the istanbul stock exchange, pages 133-150

Abstract: The purpose of this paper is to investigate whether or not firms that are taken

into the surveillance market in Istanbul Stock Exchange are experiencing financial distress. The surveillance firms present irregular behaviors and have difficulty complying with current regulation. It can be expected that the basic reason behind these irregular behaviors is financial distress. Results of the study support this expectation and show that it is possible to predict financial distress one year in advance. Principal component analysis and discriminant analysis are combined in order to estimate an integrated early warning model for financial distress prediction.

Volume 9, Issue 2 / March, 2006

Gabriele Stabile, Optimal timing of the annuity purchase: combined stochastic control and optimal stopping problem, pages 151-170

Abstract: The paper examines the optimal annuitization time and the optimal consumption/investment strategies for a retired individual subject to a constant force of mortality in an all-or-nothing framework. We allow for a different utility of consumption before and after annuitization. For a general family of preferences we characterize the value function and the optimal controls of the resulting combined stochastic control and optimal stopping problem. Assuming power utility functions we obtain explicit solutions. We show that if the individual evaluates the consumption flow and the annuity payments stream in the same way, then, depending on the parameters of the economy, the annuity is purchased at retirement or never. In the case when the individual is more risk averse in the annuity assessment, it is optimal to defer the annuitization until her wealth reaches a threshold, and such threshold depends on the parameters of the economy.

Eugene V. Dulov, Humberto Sarria Zapata and Natalia A. Andrianova, Generalized singular value decomposition and its applications in model analysis, pages 171-184

Abstract: For a variety of processes we can observe and register their characteristics, making up a sequence of measurement vectors or matrices (rectangular in general). Our goal is to extract some model dependent information using the available information. Such approaches are typical in technology (for a neat chemistry example, see [7,9]) and model analysis like parameter identification of linear stochastic dynamic systems. Since a stochastic nature of financial and economic data is evident, we can extend this data analysis technique to a number of new applications. If we are successful, some kind of adaptive filter can be further constructed (similar to the classic Kalman's one, for example). Inspired with formal model parameters, we can apply this filter to process financial data like stock information to predict and verify how close is a mathematical model to a real-time data. Namely, when provided with a set measurements represented by matrices $A_i \in M_{\{m,n\}}(\mathbb{R})$, we have to estimate a problem dependent characteristic matrices $\min_{\{r,P,B_1,\dots,B_k,Q\}} \sum_{i=1}^k \|A_i - PB_iQ^T\|_F^2$, with P, Q being orthonormal matrices, $B_i \in M_r(\mathbb{R})$, $r \leq \min\{m,n\}$. Formulated as above, the problem is usually called a generalized singular value decomposition (GSVD) problem and could be solved numerically. These matrices provide some basic information applicable for higher level automated problem solver or human interpretation.

Jose Fajardo and Ernesto Mordecki, Pricing derivatives on two-dimensional Lévy processes, pages 185-198

Abstract: The aim of this work is to use a duality approach to study the pricing of derivatives depending on two stocks driven by a bidimensional Lévy process. The main idea is to apply Girsanov's Theorem for Lévy processes, in order to reduce the posed problem to a problem with one Lévy driven stock in an auxiliary market, baptized as "dual market". In this way, we extend the results obtained by Gerber and Shiu [5] for two-dimensional Brownian motion.

Oluwatobi Oyefeso, Would there ever be consensus value and source of the equity risk premium? A review of the extant literature, pages 199-216

Abstract: This paper reviews the extant studies on the equity premium. While paper attempts to make the review comprehensive, describing all of the work in this area is difficult considering the numerous researches that have been done in this area. Essentially, the paper assesses the relationship between the excess return and the equity risk premium and draws attention to their interchangeable use in the finance literature. Existing literature is reviewed around possible theories explaining the equity premium puzzle and followed by the empirical evidence on the theories. Finally, this paper focuses on the problems of attaining consensus value and source of the market risk premium, which makes equity premium puzzle an unresolved issue among the academics and finance practitioners.

Lampros Kalyvas and Athanasios Sfetsos, Does the application of innovative internal models diminish regulatory capital? Pages 217-226

Abstract: The broad spectrum and the increased complexity of financial products that compose modern portfolios have forced credit and financial institutions to focus on innovative and more effective ways of estimating market risks. These new approaches, very often, prove to be more conservative compared to traditional approaches in terms of market risk quantification. On the other hand, according to the Basel Committee evaluation framework, this conservatism is rewarded with lower multiplication factors when calculations of capital requirements take place. The present study elaborates on the comparison of several Value-at-Risk (VaR) methodologies based on the capital requirements they provide according to the Basel Committee regulatory framework.

Frank H. Westerhoff, Technical analysis based on price-volume signals and the power of trading breaks, pages 227-244

Abstract: We propose a novel stock market model and investigate the effectiveness of trading breaks. Our nonlinear model consists of two types of traders: while fundamentalists expect prices to return towards their intrinsic values, chartists extrapolate past price movements into the future. Moreover, chartists condition their orders on past trading volume. The model is able to replicate several stylized facts of stock markets such as fat tails and volatility clustering. Using the model as an artificial stock market laboratory we find that trading breaks have the power to reduce volatility and — if fundamentals do not move too strongly — also mispricing.

Christian Koziol, Empirical exercise behavior of warrant holders and its consequences for warrant values, pages 245-268

Abstract: In this paper, we analyze the exercise behavior of warrant holders and its

impact on warrant values. For this purpose, we propose a parametric model to describing the exercise volume of warrants and calibrate it to exercise data of 40 warrants from the German market. We find that few too-early exercises but also a significant number of too-late exercises occur. This observed exercise behavior results in warrant values that are more than 3% below those under the optimal exercise strategy for at-the-money warrants and the differences are even much higher for in- and out-of-the-money warrants.

Volume 9, Issue 3 / May, 2006

Simon Archer and Rifaat Ahmed Abdel Karim, On capital structure, risk sharing and capital adequacy in Islamic banks, pages 269-280

Abstract: Islamic banks do not pay interest on customers' deposit accounts. Instead, customers' funds are placed in profit-sharing investment accounts (PSIA). Under this arrangement, the returns to the bank's customers are their pro-rata shares of the returns on the assets in which their funds are invested, and if these returns are negative so are the returns to the customers. The bank is entitled to a contractually agreed share of positive returns (profits) as remuneration for its work as asset manager; however, if the returns are zero or negative, the bank receives no remuneration but does not share in any loss. In the case of Unrestricted PSIA, the investment account holders' funds are invested (i.e., commingled) in the bank's asset pool together with the bank's shareholders' own funds and the funds of current account holders. In that case, the bank's own funds that are invested in the asset pool are treated the same as those of Unrestricted PSIA holders for profit and loss sharing purposes; however, the shareholders also receive as part of their profit the remuneration earned by the bank as asset manager (less certain expenses not chargeable to the PSIA holders). This remuneration (management fees) represents an important source of revenue and profits for Islamic banks. From a capital market perspective, this arrangement presents an apparent anomaly, as follows: shareholders and Unrestricted PSIA holders share the same asset risk on the commingled funds, but shareholders enjoy higher returns because of the management fees. On the other hand, competitive pressure may induce the bank to forgo some of its management fees in order to pay a competitive return to its PSIA holders. In this way, some of the PSIA holders' asset risk is absorbed by the shareholders. This phenomenon has been termed "displaced commercial risk" [2]. This paper analyzes this phenomenon. We argue that, in principle, displaced commercial risk is potentially an efficient and value-creating means of...

Tomas Bjork, Magnus Blix and Camilla Landen, On finite dimensional realizations for the term structure of futures prices, pages 281-314

Abstract: We consider HJM type models for the term structure of futures prices, where the volatility is allowed to be an arbitrary smooth functional of the present futures price curve. Using a Lie algebraic approach we investigate when the infinite dimensional futures price process can be realized by a finite dimensional Markovian state space model, and we give general necessary and sufficient conditions, in terms of the volatility structure, for the existence of a finite dimensional realization. We study a number of concrete applications including a recently developed model for gas futures. In particular we provide necessary and sufficient conditions for when the induced spot price is a Markov process. In particular we can prove that the only HJM type futures price models

with spot price dependent volatility structures which generically possess a spot price realization are the affine ones. These models are thus the only generic spot price models from a futures price term structure point of view.

Damiano Brigo and Laurent Cousot, The stochastic intensity SSRD model implied volatility patterns for credit default swap options and the impact of correlation, pages 315-341

Abstract: In this paper we investigate implied volatility patterns in the Shifted Square Root Diffusion (SSRD) model as functions of the model parameters. We begin by recalling the Credit Default Swap (CDS) options market model that is consistent with a market Black-like formula, thus introducing a notion of implied volatility for CDS options. We examine implied volatilities coming from SSRD prices and characterize the qualitative behavior of implied volatilities as functions of the SSRD model parameters. We introduce an analytical approximation for the SSRD implied volatility that follows the same patterns in the model parameters and that can be used to have a first rough estimate of the implied volatility following a calibration. We compute numerically the CDS-rate volatility smile for the adopted SSRD model. We find a decreasing pattern of SSRD implied volatilities in the interest-rate/intensity correlation. We check whether it is possible to assume zero correlation after the option maturity in computing the option price.

Mario Cerrato and Andrea Iannelli, Testing for random walk and structural breaks in hedge funds returns, pages 341-358

Abstract: We investigate the presence of managerial skills in different categories of hedge funds. Our approach is more flexible than others [7, 10] since it does not make any a priori assumptions regarding the distribution of returns. We find that the Global Macro and Market Neutral funds do not follow a pure random walk. In fact, for both these models the drift parameter is statistically significant. This result rejects our initial hypothesis that hedge funds (expected-excess) returns are on average zero. Indeed, the positive intercept can be interpreted as evidence of managerial skill. We conclude that investors seeking to invest in hedge funds should consider Market Neutral funds and Global Macro funds as possible investments.

Arie Harel and Giora Harpaz, Security markets with price limits: a Bayesian approach, pages 359-372

Abstract: Several financial markets impose daily price limits on individual securities. Once a price limit is triggered, investors observe either the limit floor or ceiling, but cannot know with certainty what the true equilibrium price would have been in the absence of such limits. The price limits in most exchanges are typically based on a percentage change from the previous day's closing price, and can be expressed as return limits. We develop a Bayesian forecasting model in the presence of return limits, assuming that security returns are governed by identically and independently shifted-exponential random variables with an unknown parameter. The unique features of our Bayesian model are the derivations of the posterior and predictive densities. Several numerical predictions are generated and depicted graphically. Our main theoretical result with policy implications is that when return-limit regulations are tightened, the

price-discovery process is impeded and investor's welfare is reduced.

Jinggang Huang, Sven Sandow and Craig Friedman, Information, model performance, pricing and trading measures in incomplete markets, pages 373-400

Abstract: In the incomplete market setting, we define a generalized Kullback-Leibler relative entropy in terms of an investor's expected utility. We motivate, from an economic point of view, this quantity — the relative U-entropy. Relative U-entropy measures the discrepancy from a set of pricing measures to a single probability measure. We show that the relative U-entropy shares a number of important properties with the usual Kullback-Leibler relative entropy, and establish the link between this quantity and the pricing measure corresponding to the least favorable market completion. We also describe an economic performance measure for probabilistic models that may be used by an investor in an incomplete market setting. We then introduce a statistical learning paradigm suitable for investors who learn models and base investment decisions, in an incomplete market, on these models.

Agnes Tourin, Numerical solutions for the Cheridito-Soner-Touzi super-replication model under gamma constraints, pages 401-414

Abstract: We solve, by using a monotone and stable approximation, the fully nonlinear degenerate parabolic equation derived by Cheridito, Soner and Touzi [8] from the stochastic control problem of super-replicating a contingent claim under gamma constraints. We present some numerical results.

Ali Bora Yigitbasioglu and Carol Alexander, Pricing and hedging convertible bonds: delayed calls and uncertain volatility, pages 415-454

Abstract: Arbitrage-free price bounds for convertible bonds are obtained assuming equity-linked hazard rates, stochastic interest rates and different assumptions about default and recovery behavior. Uncertainty in volatility is modeled using a stochastic volatility process for the common stock that lies within a band but makes few other assumptions about volatility dynamics. A non-linear multi-factor reduced-form equity-linked default model leads to a set of non-linear partial differential complementarity equations that are governed by the volatility path. Empirical results focus on call notice period effects. Increasingly pessimistic values for the issuer's substitution asset obtain as we introduce more uncertainty during the notice period. Uncertain in volatility, in particular, appears to be an important determinant of the call premium that is so often observed in issuer's call policies.

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Denis Belomestny and Grigori N. Milstein, Monte carlo evaluation of American options using consumption processes, pages 455-482

Abstract: We develop a new approach for pricing both continuous-time and discrete-time American options which is based on the fact that any American option is equivalent to a European one with a consumption process involved. This approach admits the construction of an upper bound (a lower bound) on the true price using some lower bound (an upper bound) by Monte Carlo simulation. A number of effective estimators of upper

and lower bounds with the reduced variance are proposed. The method is supported by numerical experiments which look promising.

T. J. Brailsford, J. H. W. Penm and R. D. Terrell, An analysis of Asian market integration pre- and post-crisis, pages 483-502

Abstract: In this paper cointegrating relations between six East and Southeast Asian markets relative to a base cluster of three global markets are investigated in the framework of zero-non-zero (ZNZ) patterned vector error-correction modelling (VECM). The analysis focuses upon market relations both before and after the Asian currency crisis. The strength of integration between markets is also evaluated by extending Geweke's measurement approach within this framework. The results show that, since the crisis, estimated integration strengths have become more powerful between the Asian and global markets, with the US market leading both the Asian markets and the markets of Japan and the UK.

Paul Magis and Alessandro Sbuelz, The value of fighting irreversible demise by softening the irreversible cost, pages 503-516

Abstract: We study a novel issue in the real-options-based technology innovation literature by means of double barrier contingent claims analysis. We show how much a firm with the monopoly over a project is willing to spend in investment technology innovation that softens the irreversible cost of accessing the project before its irreversible demise. The answer depends on the project's characteristics and on the effectiveness demanded from technology innovation.

Chi Chiu Chu and Yue Kuen Kwok, Pricing participating policies with rate guarantees, pages 517-532

Abstract: We construct the contingent claims models that price participating policies with rate guarantees and default risk. These policies are characterized by the sharing of profits from an investment portfolio between the insurer and the policyholders. A certain reserve distribution mechanism is employed to credit interest at or above certain specified guaranteed rate periodically to the policyholders. Besides the reversionary reserve distribution, terminal bonus is also paid to the policyholders if the terminal surplus is positive. However, the insurer may default at maturity and the policyholders can only receive the residual assets. By neglecting market frictions, mortality risk and surrender option, and under certain assumptions on the interest rate crediting mechanism, we are able to find analytic approximation solution to the pricing model using perturbation techniques. We also develop effective finite difference algorithms for the numerical solution of the contingent claims models. Pricing behaviors of these participating policies with respect to various parameters in the pricing models are examined.

Marcellino Gaudenzi and Maria Antonietta Lepellere, Pricing and hedging american barrier options by a modified binomial method, pages 533-554

Abstract: The aim of this work is to present a modification of the standard binomial method which allows to price American barrier options improving the efficiency of the trinomial methods. Our approach is based on a suitable interpolation of binomial values and allows to price and hedge such options also in the critical case of near barriers. All

the different types of single barrier options are considered, in the case of knock-in barriers a new implementation of the binomial method is provided.

Claudia Ceci and Anna Gerardi, A model for high frequency data under partial information: a filtering approach, pages 555-576

Abstract: A general model for intraday stock price movements is studied. The asset price dynamics is described by a marked point process Y , whose local characteristics (in particular the jump-intensity) depend on some unobservable hidden state variable X . The dynamics of Y and X may be strongly dependent. In particular the two processes may have common jump times, which means that the actual trading activity may affect the law of X and could be also related to the possibility of catastrophic events. The agents, in this model, are restricted to observing past asset prices. This leads to a filtering problem with marked point process observations. The conditional law of X given the past asset prices (the filter) is characterized as the unique weak solution of the Kushner–Stratonovich equation. An explicit representation of the filter is obtained by the Feynman–Kac formula using a linearization method. This representation allows us to provide a recursive algorithm for the filter computation.

Roberto Baviera, Bond market model, pages 577-596

Abstract: We describe the Bond Market Model, a multi-factor interest rate term structure model, where it is possible to price with Black-like formulas the three classes of over-the-counter plain vanilla options. We derive the prices of caps/floors, bond options and swaptions. A comparison with Libor Market Model and Swap Market Model is discussed in detail, underlining advantages and limits of the different approaches.

Olaf Menkens, Crash hedging strategies and worst-case scenario portfolio optimization, pages 597-618

Abstract: Crash hedging strategies are derived as solutions of non-linear differential equations which itself are consequences of an equilibrium strategy which make the investor indifferent to uncertain (down) jumps. This is done in the situation where the investor has a logarithmic utility and where the market coefficients after a possible crash may change. It is scrutinized when and in which sense the crash hedging strategy is optimal. The situation of an investor with incomplete information is considered as well. Finally, introducing the crash horizon, an implied volatility is derived.

Qiang Meng and Ananda Weerasinghe, Optimal portfolio selection strategies in the presence of transaction costs, pages 619-642

Abstract: We consider an investor who has available a bank account (risk free asset) and a stock (risky asset). It is assumed that the interest rate for the risk free asset is zero and the stock price is modeled by a diffusion process. The wealth can be transferred between the two assets under a proportional transaction cost. Investor is allowed to obtain loans from the bank and also to short-sell the risky asset when necessary. The optimization problem addressed here is to maximize the probability of reaching a financial goal a before bankruptcy and to obtain an optimal portfolio selection policy. Our optimal policy is a combination of local-time processes and jumps. In the interesting case, it is determined by a non-linear switching curve on the state space. This work is a

generalization of Weerasinghe [20], where this switching boundary is a vertical line segment.

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Thierry Ane Two-component extreme value distribution for asia-pacific stock index returns, pages 643-672

Abstract: Financial risk management typically deals with low-probability events in the tails of asset return distributions. To better capture the behavior of these tails, several studies have clearly highlighted that one should rely on a methodology that directly focuses on the tails of the distribution rather than getting the tails as an outcome of modelling the entire density function. Traditional Extreme Value Theory (EVT) distributions, however, provide a good fit for the bulk of the extreme data but usually underestimate a small amount of observations considered as "outliers". Since the main objective of risk management analysis is to estimate the size and probability of very large price movements, these "outliers" are by definition the very events we need to investigate. In this paper we suggest the use of a Two-Component Extreme Value (TCEV) distribution where a 'basic distribution' generates ordinary extremes (more frequent and less severe in the mean) while an "outlying distribution" generates rarer but severe extremes. Goodness-of-fit tests show the superiority of this distribution to capture the extremes of eleven MSCI Indices of the Pacific-Basin region relative to traditional EVT densities. Measures of accuracy and efficiency used to assess the performance of VaR forecasts also indicate that the additional flexibility brought by the TCEV model provides strong improvements for risk management.

Gunter H. Meyer, The Black Scholes Barenblatt equation for options with uncertain volatility and its application to static hedging, pages 673-704

Abstract: The Black Scholes Barenblatt (BSB) equation for the envelope of option prices with uncertain volatility and interest rate is derived from the Black Scholes equation with the maximum principle for diffusion equations and shown to be equivalent to a readily solvable standard Black Scholes equation with a nonlinear source term. Analogous arguments yield the envelope for the delta of option prices. We then interpret the concept of static hedging for narrowing the envelope in terms of partial differential equations and define the optimal static hedge and computable approximations to it. We apply the BSB equation to find numerically some optimally hedged portfolios of representative European and American options.

Riccardo Rebonato, Forward-rate volatilities and the swaption matrix: why neither time-homogeneity nor time-dependence are enough, pages 705-746

Abstract: This work presents the first systematic analysis of the whole swaption matrix by fitting a parsimonious, nonlinear, financially-inspired volatility model to market data. The study uses several years of data spanning period of major market volatility. We find that the quality of the fits is good (on average of the same magnitude as the bid-offer spread), and better when a displaced-diffusion approach is chosen, but some systematic shortcomings are observed and discussed. The analysis suggests that a two-regime Markov chain approach may be more successful and better financially motivated. More

generally, the present study highlights the shortcomings of purely time-dependent or time-homogenous approaches. These findings should be applicable to other option markets as well. Finally, we find that the present (nonlinear) model vastly outperforms PCA-based approaches when it comes to predicting moves in implied volatilities.

Aman Srivastava, An analysis and measurement of confidence of stock investors in India, pages 747-776

Abstract: This paper intends to establish the importance of expectations and confidence of Indian investors on the financial market in India. Previous research of investors in other countries has shown that both of these attitudes manifest clear tendencies to change through time and strongly influence the behavior of the pragmatic markets. The field of behavioral finance — an emerging field in financial analysis that takes explicit account of psychological factors — is the driving force of this research. This research is based on information obtained through a survey process in India.

Erhan Bayraktar, Li Chen and H. Vincent Poor, Projecting the forward rate flow onto a finite dimensional manifold, pages 777-786

Abstract: Given a Heath–Jarrow–Morton (HJM) interest rate model M and a parametrized family of finite dimensional forward rate curves G , this paper provides a technique for projecting the infinite dimensional forward rate curve r_t given by M onto the finite dimensional manifold G . The Stratonovich dynamics of the projected finite dimensional forward curve are derived and it is shown that, under the regularity conditions, the given Stratonovich differential equation has a unique strong solution. Moreover, this projection leads to an efficient algorithm for implicit parametric estimation of the infinite dimensional HJM model. The feasibility of this method is demonstrated by applying the generalized method of moments.

Shwu-Jane Shieh, Long memory and sampling frequencies: evidence in stock index futures markets, pages 787-800

Abstract: The long-term dependent behavior in the close prices of the S&P 500, Nikkei 225, and Dow Jones index futures contracts are investigated by using the ARFIMA (p, d, q) model to estimate the order of the fractional integration parameters for a large range of sampling frequencies: from one-minute to monthly frequencies. The empirical evidence shows that the close prices exhibit anti-persistence properties for most of the sampling frequencies. This suggests that the contrarian's trading strategies in relation to stock index futures markets have a positive value. Moreover, the empirical evidence indicates that the higher frequency of the data, the stronger degree of contrarian behaviors, particularly for S&P 500 and Dow Jones stock index futures contracts.

Rose Neng Lai, Seow Eng Ong and Tien Foo Sing, Values of mortgages with top-up payment options, pages 801-824

Abstract: The right of lenders to request for top-ups of negative equity when the property value falls below the loan outstanding is a little known, yet widely adopted provision in mortgage documents in many Asian markets. We analyze the effect of the top-up option by appealing to a contingent claim framework. Specifically, we model the top-up option as a synthetic option comprising a long put to request for a top-up, a short

put that cancels out the first option in the event of a default, and a binary put option once triggered will yield a value equivalent to the difference between the mortgage outstanding and the property value. The results of comparative analyses show that the lender's right to request for top-ups is valuable when the negative mortgage equity increases, especially in a market where price is highly volatile. The top-up clause fundamentally affects the mortgage values for both the borrower and the lender. We show that lender's inaction by not calling for top-ups when negative mortgage equity occurs is suboptimal. On the other hand, the lenders' exercise of the in-the-money top-up options may lead to early default by the mortgagor. This is one of the reasons why lenders exercise this option only very sparingly in practice. This mortgage design has economic value to the lenders, it is, however, not optimal in time of volatile market. The policy implication of the findings is that the sub-optimal top-up feature should be removed from the mortgage contract, and it will not severely jeopardize the lender's ability to enforce payments in the mortgages.

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Robert J. Elliott, Tak Kuen Siu and Leunglung Chan, Option pricing for Garch models with Markov switching, pages 825-842

Abstract: In this paper we develop a method for pricing derivatives under a Markov switching version of the Heston-Nandi GARCH (1, 1) model by using a well known tool from actuarial science, namely the Esscher transform. We suppose that the dynamics of the GARCH process switch over time according to one of the regimes described by the states of an observable Markov chain process. By augmenting the conditional Esscher transform with the observable Markov switching process, a Markov switching conditional Esscher transform (MSCET) is developed to identify a martingale measure for option valuation in the incomplete market described by our model. We provide an alternative approach for the derivation of an analytical option valuation formula under the Markov switching Heston-Nandi GARCH (1, 1) model. The use of the MSCET can be justified by considering a utility maximization problem with respect to a power utility function associated with the Markov switching risk-averse parameters.

Fred Espen Benth, Martin Groth and Paul C. Kettler, A quasi-Monte Carlo algorithm for the normal inverse Gaussian distribution and valuation of financial derivatives, pages 843-868

Abstract: We propose a quasi-Monte Carlo (qMC) algorithm to simulate variates from the normal inverse Gaussian (NIG) distribution. The algorithm is based on a Monte Carlo technique found in Rydberg [13], and is based on sampling three independent uniform variables. We apply the algorithm to three problems appearing in finance. First, we consider the valuation of plain vanilla call options and Asian options. The next application considers the problem of deriving implied parameters for the underlying asset dynamics based on observed option prices. We employ our proposed algorithm together with the Newton Method, and show how we can find the scale parameter of the NIG-distribution of the logreturns in case of a call or an Asian option. We also provide an extensive error analysis for this method. Finally we study the calculation of Value-at-Risk for a portfolio of nonlinear products where the returns are modeled by NIG random variables.

Tao Pan, Stochastic portfolio optimization with log utility G, pages 869-889

Abstract: A portfolio optimization problem on an infinite time horizon is considered. Risky asset price obeys a logarithmic Brownian motion, and the interest rate varies according to an ergodic Markov diffusion process. Moreover, the interest rate fluctuation is correlated with the risky asset price fluctuation. The goal is to choose optimal investment and consumption policies to maximize the infinite horizon expected discounted log utility of consumption. A dynamic programming principle is used to derive the dynamic programming equation (DPE). The explicit solutions for optimal consumption and investment control policies are obtained. In addition, for a special case, an explicit formula for the value function is given.

Yevgeny Goncharov, An intensity-based approach to the valuation of mortgage contracts and computation of the endogenous mortgage rate, pages 889-914

Abstract: This paper gives a general mortgage model subject to sub-optimal prepayment behavior of borrowers. The proposed classification of approaches to the option-based and mortgage-rate-based (MRB) specification is validated by the fact that these two approaches require different analytical and numerical tools. With the option-based specification of the prepayment intensity, our model is the first continuous-time model; this gives advantage in the numerical treatment of the model. We propose a new approach based on the MRB idea with the endogenous mortgage rate process. The mortgage rate process is defined and the existence of a solution is proven for the option-based specification of the prepayment process. A numerical procedure for finding the endogenous mortgage rate is proposed.

Oleg Kudryavtsev and Sergei Levendorskii, Pricing of first touch digitals under normal inverse Gaussian processes, pages 915-950

Abstract: We calculate prices of first touch digitals under normal inverse Gaussian (NIG) processes, and compare them to prices in the Brownian model and double exponential jump-diffusion model. Numerical results are produced to show that for typical parameters values, the relative error of the Brownian motion approximation to NIG price can be 2–3 dozen percent if the spot price is at the distance 0.05–0.2 from the barrier (normalized to one). A similar effect is observed for approximations by the double exponential jump-diffusion model, if the jump component of the approximation is significant. We show that two jump-diffusion processes can give approximately the same results for European options but essentially different results for first touch digitals and barrier options. A fast approximate pricing formula under NIG is derived.

Zhong-Fei Li, Kai W. Ng, Ken Seng Tan and Hailiang Yang, Optimal constant-rebalanced portfolio investment strategies for dynamic portfolio selection, pages 951-966

Abstract: In this paper we propose a variant of the continuous-time Markowitz mean-variance model by incorporating the Earnings-at-Risk measure in the portfolio optimization problem. Under the Black-Scholes framework, we obtain closed-form expressions for the optimal constant-rebalanced portfolio (CRP) investment strategy. We also derive explicitly the corresponding mean-EaR efficient portfolio frontier, which is a generalization of the Markowitz mean-variance efficient frontier.

Ernst Eberlein, Wolfgang Kluge and Antonis Papapantoleon, Symmetries in Lévy term structure models, pages 967-986

Abstract: Symmetry results between call and put options have been widely studied in equity markets. We provide similar symmetry results between caps and floors in a Heath–Jarrow–Morton, a LIBOR and a forward price model, driven by time-inhomogeneous Lévy processes. On the way, we review the basic properties of these models.

Jonatan Eriksson, Monotonicity in the volatility of single-barrier option prices, pages 987-996

Abstract: We generalize earlier results on barrier options for puts and calls and log-normal stock processes to general local volatility models and convex contracts. We show that $\Gamma \geq 0$, that Δ has a unique sign and that the option price is increasing with the volatility for convex contracts in the following cases: • If the risk-free rate of return dominates the dividend rate, then it holds for up-and-out options if the contract function is zero at the barrier and for down-and-in options in general. • If the risk-free rate of return is dominated by the dividend rate, then it holds for down-and-out options if the contract function is zero at the barrier and for up-and-in options in general. We apply our results to show that a hedger who misspecifies the volatility using a time-and-level dependent volatility will super-replicate any claim satisfying the above conditions if the misspecified volatility dominates the true (possibly stochastic) volatility almost surely.

Vicky Henderson and David Hobson, A note on irreversible investment, hedging and optimal consumption problems, pages 997-1007

Abstract: A canonical problem in real option pricing, as described in the classic text of Dixit and Pindyck [2], is to determine the optimal time to invest at a fixed cost, to receive in return a stochastic cashflow. In this paper we are interested in this problem in an incomplete market where the cashflow is not spanned by the traded assets. We follow the formulation in Miao and Wang [21]; our contribution is to show that significant progress can be made in solving the Hamilton-Jacobi-Bellman equation and that the optimal exercise threshold can be characterized quite precisely.