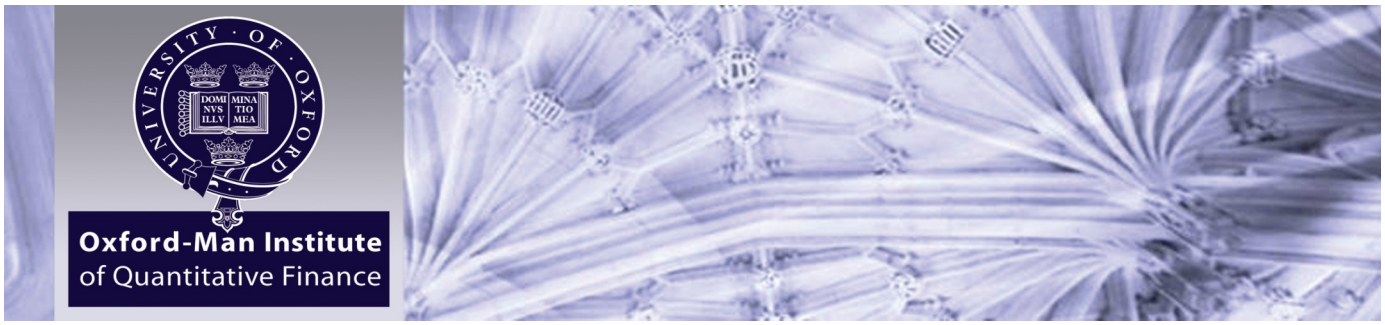

Oxford-Man Institute
of Quantitative Finance

"Robust Techniques in Quantitative Finance" Conference

18th and 19th March 2010

Scientific Committee:

Mark Davis (Imperial College London)
Roger Lee (University of Chicago)
Michael Monoyios (University of Oxford)
Jan Obłój (Oxford-Man Institute, University of Oxford)
Huyên Pham (Université Paris VII)

The Oxford-Man Institute
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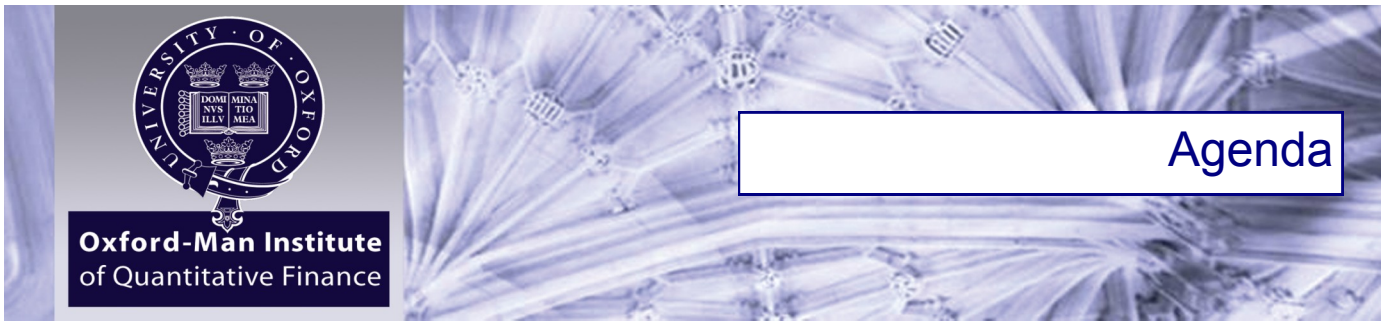
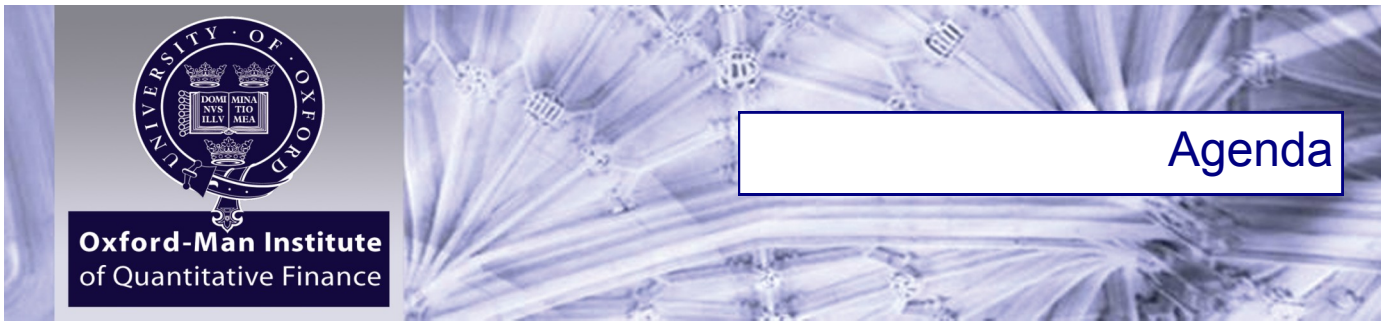
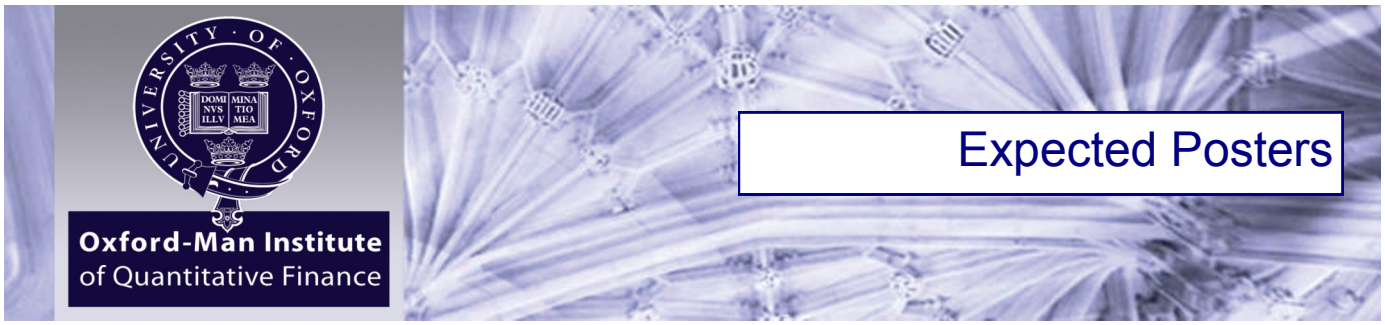


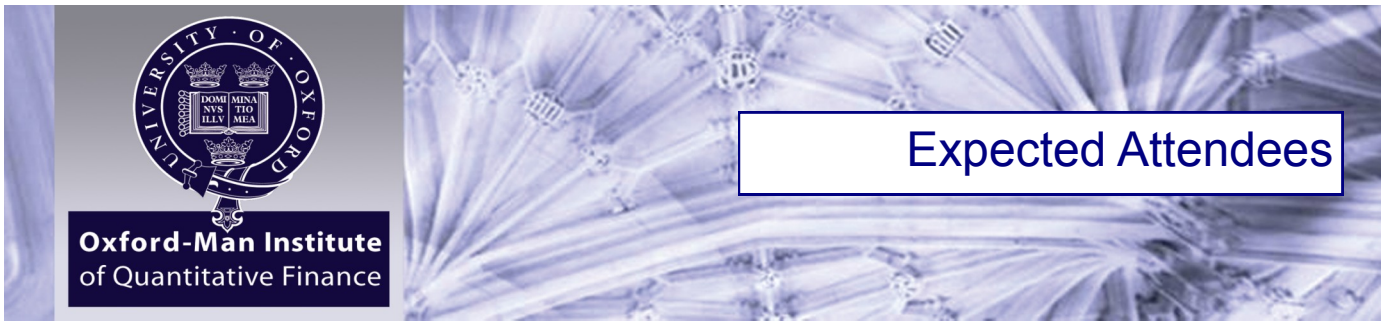
Wednesday 17th March	
18.00-19.30	Welcome Drinks Reception at Oxford-Man Institute Eagle House
Thursday 18th March	
8.40-9.10	Registration
9.10-9.20	Opening
9.20-10.00 10.00-10.15	**Mark Davis** (Imperial College) "Arbitrage Bounds for Weighted Variance Swap Prices" Discussion led by **Sam Howison** (University of Oxford)
10.15-10.45	**Coffee**
10.45-11.25 11.25-11.40	**Huyên Pham** (Université Paris VII) "Stochastic Control under Progressive Enlargement of Filtrations and Applications to Multiple Defaults Risk Management" Discussion led by **Nizar Touzi** (Ecole Polytechnique)
11.40-12.20 12.20-12.35	**Wolfgang Runggaldier** (Università delgi Studi di Padova) "Portfolio Optimization in Defaultable Markets under Incomplete Information" Discussion led by **Micheal Monoyios** (University of Oxford)
12.35-13.00	**Poster Session**
13.00-14.00	**Lunch**
14.00-14.40 14.40-14.55	**Raman Uppal** (London Business School) "Keynes Meets Markowitz: The Trade-Off between Familiarity and Diversification" Discussion led by **Xunyu Zhou** (University of Oxford)
14.55-15.35 15.35-15.50	**Lars Peter Hansen** (University of Chicago) "Fragile Beliefs and the Price of Uncertainty" Discussion led by **Matthew Pritsker** (Federal Reserve)
15.50-16.20	**Coffee**
16.20-17.00 17.00-17.15	**Alex Schied** (Mannheim University) "Robustness and non-robustness in market impact modelling" Discussion led by **Marco Frittelli** (Università delgi Studi di Milano)
17.15-17.55 17.55-18.10	**Walter Schachermayer** (University of Vienna) "A direct proof of the Bichteler-Dellacherie theorem related to arbitrage" Discussion led by **Josef Teichmann** (ETH Zurich)
19.00	**Dinner at Lady Margaret Hall**



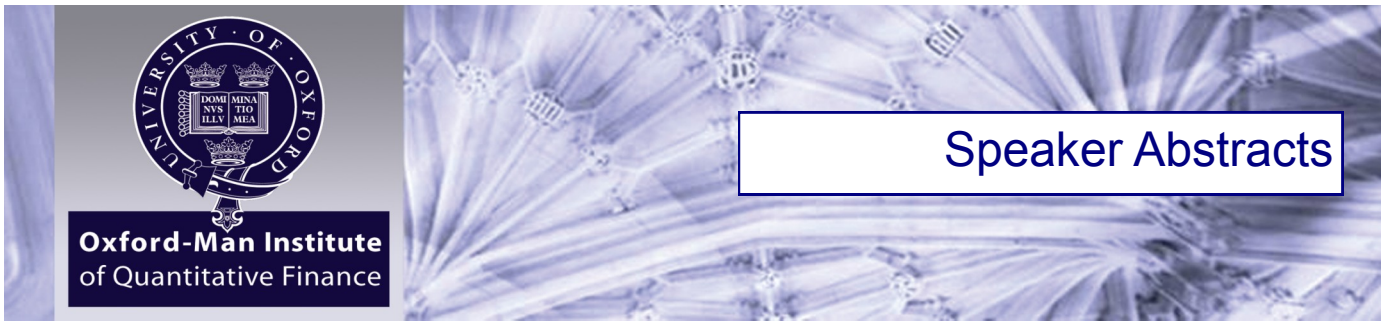
Friday 19th March	
9.20-10.00 10.00-10.15	**Bruno Dupire** (Bloomberg) "Supurreplication" Discussion led by **TBA**
10.15-10.45	**Coffee**
10.45-11.25 11.25-11.40	**Roger Lee** (University of Chicago) "Robust Hedging of Variance Contracts" Discussion led by **Sergei Nadtochiy** (Oxford-Man Institute)
11.40-12.20 12.20-12.35	**Alexander Cox** (University of Bath) "Root's Skorokhod Embedding: Optimality and Applications to Variance Options" Discussion led by **Jan Obłój** (University of Oxford)
12.35-13.00	**Poster Session**
13.00-14.00	**Lunch**
14.00-14.40 14.40-14.55	**David Hobson** (University of Warwick) "Recovering a Stock Price Process from Perpetual Option Prices" Discussion led by **Chris Rogers** (University of Cambridge)
14.55-15.35 15.35-15.50	**Miklós Rásonyi** (University of Edinburgh) "Fragility of Arbitrage and Bubbles in Diffusion Models" Discussion led by **Monique Jeanblanc** (Université d'Every)
15.50-16.20	**Coffee**
16.20-17.00 17.00-17.15	**Dirk Becherer** (Humboldt-Universität zu Berlin) "From Bounds on Optimal Growth Towards a Theory of Good-Deal Hedging" Discussion led by **Martin Schwiezer** (ETH Zurich)
17.15-17.55 17.55-18.10	**Per Mykland** (Oxford-Man Institute) "Conservative Empirical Pricing: Trading Options with Statistical Prediction Intervals" Discussion led by **Rene Carmona** (Princeton University)



First Name	Surname	Affiliation
Beatrice	Acciaio	Technische Universität Wien
Christa	Cuchiero	ETH Zurich
Martin	Keller-Ressel	ETH Zurich
Marco	Maggis	Università delgi Studi di Milano
Michael	Monoyios	University of Oxford
Matthew	Pritsker	Federal Reserve
An	Ta Thi Kieu	Universitet I Oslo



First Name	Surname	Affiliation
Pauline	Barrieu	LSE
Rene	Carmona	Princeton University
Bruno	Dupire	Bloomberg
Nicole	El Karoui	CMAP, Ecole Polytechnique
Romuald	Elie	ENSAE
Martin	Forde	Dublin City University
Marco	Frittelli	Università delgi Studi di Milano
Raphael	Hauser	University of Oxford
Sam	Howison	University of Oxford
Monique	Jeanblanc	Université d'Every
Anis	Matoussi	Universite du Maine
Sergei	Nadtochiy	University of Oxford
Jan	Obłój	University of Oxford
Matthew	Pritsker	Federal Reserve
Christoph	Reisinger	University of Oxford
Chris	Rogers	University of Cambridge
Martin	Schweizer	ETH Zurich
Josef	Teichmann	ETH Zurich
Nizar	Touzi	CMAP, Ecole Polytechnique
Alan	Whitely	University of Oxford
Marek	Wielgosz	Polish Financial Supervision Authority
Yong	Xie	University of Oxford
Zuoquan	Xu	University of Oxford
Wei	Yang	Swansea University
Thaleia	Zariphopoulou	University of Oxford
Yifei	Zhong	University of Oxford
Chongrui	Zhou	University of Oxford
Xunyu	Zhou	University of Oxford



Dirk Becherer (Humboldt-Universität zu Berlin) "From Bounds on Optimal Growth Towards a Theory of Good-Deal Hedging"

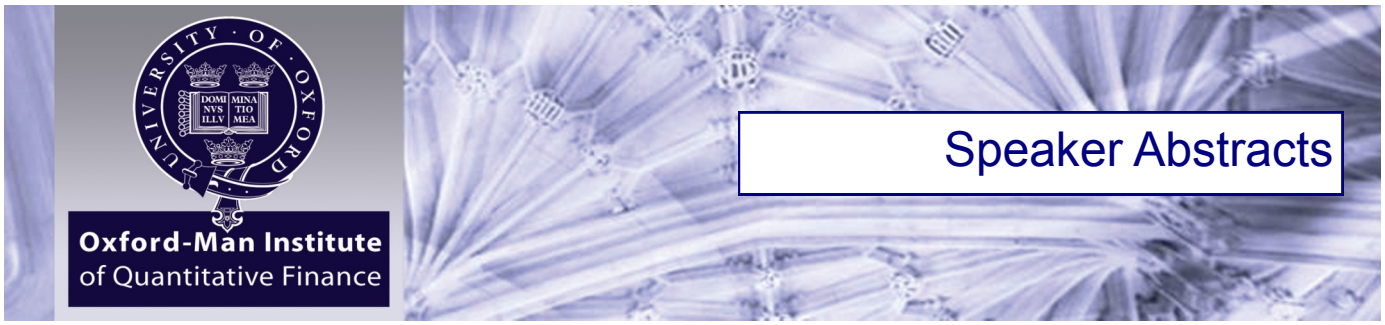
Abstract: Good-deal bounds have been introduced as a way to obtain valuation bounds for derivative assets which are tighter than the arbitrage bounds. This is achieved by ruling out not only those prices that violate no-arbitrage restrictions but also trading opportunities that are `too good'.

We study dynamic good-deal valuation bounds that are derived from bounds on optimal expected growth rates, inducing good dynamic properties for good-deal valuation bounds in a general semi-martingale setting. When asset prices and state processes evolve as diffusion- or Ito-processes, good-deal bounds are conveniently described by backward stochastic differential equations. We show that good-deal bounds arise as value functions from an optimal control problem, where a dynamic coherent risk measure is minimized by the choice of an optimal hedging strategy. This demonstrates how the theory of no-good-deal
valuation can be associated to a concept of dynamic hedging in continuous time. The risk measure is represented as expected loss under a worst-case scenario from a family of probability measures. We discuss variations of the topic, including uncertainty about excess returns of assets.

Alexander Cox (University of Bath) "Root's Skorokhod Embedding: Optimality and Applications to Variance Options"

Abstract: We investigate a construction of a Skorokhod embedding due to Root (1969), which has been the subject of recent interest for applications in Mathematical Finance (Dupire, Carr & Lee), where the construction has applications for model-free pricing and hedging of variance derivatives.

In this context, there are two related questions: firstly of the construction of the stopping time, which is related to a free boundary problem, and in this direction, we expand on work of Dupire and Carr & Lee; secondly of the optimality of the construction, which is originally due to Rost (1976). In the financial context, optimality is connected to the construction of hedging strategies, and by giving a novel proof of the optimality of the Root construction, we are able to identify model-free hedging strategies for variance derivatives. (Joint work with Jiajie Wang)



Mark Davis (Imperial College) "Arbitrage Bounds for Weighted Variance Swap Prices"

Abstract: This paper builds on earlier work by Davis and Hobson (Mathematical Finance, 2007) giving model-free---except for a 'frictionless markets' assumption---necessary and sufficient conditions for absence of arbitrage given a set of current-time put and call options on some underlying asset. Here we suppose that the prices of a set of put options, all maturing at the same time, are given and satisfy the conditions for consistency with absence of arbitrage. We now add a path-dependent option, specifically a weighted variance swap, to the set of traded assets and ask what are the conditions on its time-0 price under which consistency with absence of arbitrage is maintained. Vanilla variance swaps, corridor swaps and gamma swaps are special cases of weighted variance swaps. In general, we find that there is always a non-trivial lower bound to the range of arbitrage-free prices, but only in the case of a corridor swap do we obtain a finite upper bound. In the case of, say, the vanilla variance swap, a finite upper bound exists when there are additional traded European options which constrain the left wing of the volatility surface in appropriate ways. These results are obtained under the basic assumption that the underlying asset price process has continuous paths. This is joint work with Vimal Raval and Jan Obłój .

Bruno Dupire (Bloomberg) "Superreplication"

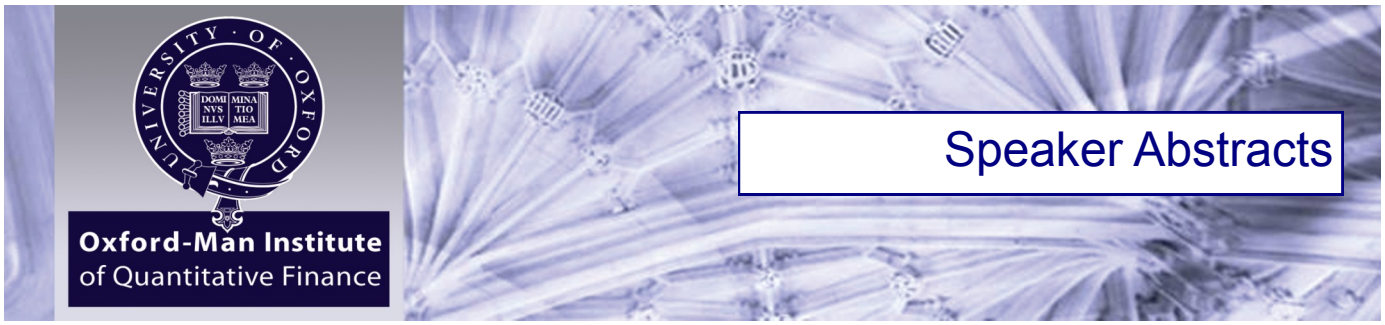
Abstract: In troubled times many models and hedges collapse and model free strategies are back in favor. We show that the use of traded options and the ability to roll down the hedge make super-replicating strategies much more attractive than often thought, especially in a portfolio context.
We also make use of functional Ito calculus to decompose any (path dependent) claim into convex and time components. It is linked to an analysis of the increasing process in Kramkov's optional decomposition and leads to a canonical decomposition of a claim into 4 components. We illustrate this approach with barrier options, Asian options and dispersion trades.

Lars Peter Hansen (University of Chicago) "Fragile Beliefs and the Price of Uncertainty"

Abstract: A representative consumer uses Bayes' law to learn about parameters and to construct probabilities with which to perform ongoing model averaging. The arrival of signals induces the consumer to alter his posterior distribution over parameters and models. The consumer copes with specification doubts by slanting probabilities pessimistically. One of his models puts long-run risks in consumption growth. The pessimistic probabilities slant toward this model and contribute a counter-cyclical and signal-history-dependent component to prices of risk.

David Hobson (Warwick University) "Recovering a Stock Price Process from Perpetual Option Prices"

Abstract: It is well-known how to determine the price of perpetual American options if the underlying stock price is a time-homogeneous diffusion. In this talk we consider the inverse problem, i.e. given prices of perpetual American options for different strikes we describe when it is possible to construct a time-homogeneous model for the stock price which reproduces the given option prices.



Roger Lee (University of Chicago) "Robust Hedging of Variance Contracts"

Abstract: We show that contracts on the quadratic variation of a time-changed Levy process admit hedging strategies, and hence pricing relationships, which are robust to misspecification of the stochastic time-change, given assumptions on the driving Levy process. Joint with Peter Carr.

Per Mykland (Oxford-Man Institute) "Conservative Empirical Pricing: Trading Options with Statistical Prediction Intervals"

Abstract: The paper shows how to combine (historical) statistical data and (current, cross-sectional) market prices to form conservative pricing and trading strategies for options. The prices and trading are robust in that they depend on model assumptions only via statistical estimators. In the case of convex European options, the combined information can be summarized in a ``worst case'' state price distribution. Also in this case, trading can be implemented with the help of realized volatility measures. The methodology can be invoked at any time in the life of an option, and is particularly useful for setting aside reserves against model failure in options trading.

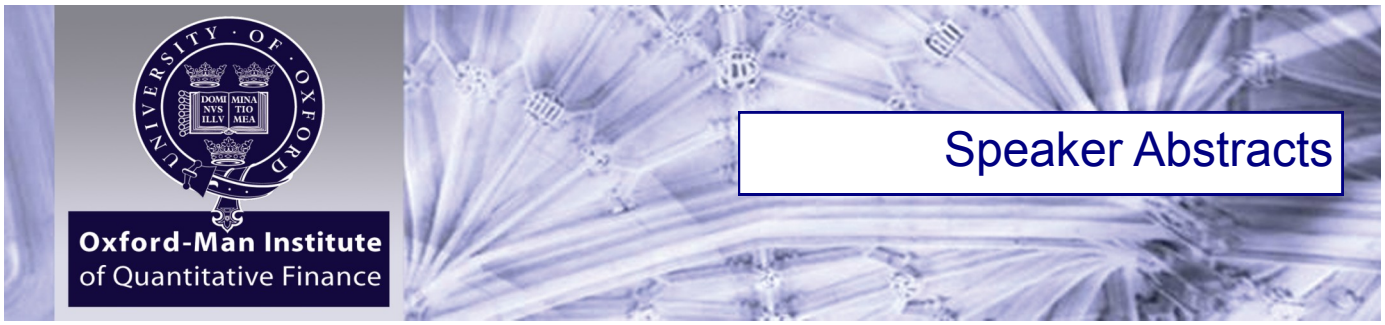
Huyên Pham (Université Paris VII) "Stochastic Control under Progressive Enlargement of Filtrations and Applications to Multiple Defaults Risk Management"

Abstract: We formulate and investigate a general stochastic control problem under a progressive enlargement of filtration. The global information is enlarged from a reference filtration and the knowledge of multiple random times together with associated marks when they occur. By working under a density hypothesis on the conditional joint distribution of the random times and marks, we prove a decomposition of the original stochastic control problem under the global filtration into classical stochastic control problems under the reference filtration, which are determined in a finite backward induction. Our method revisits and extends in particular stochastic control of diffusion processes with finite number of jumps.

This study is motivated by optimization problems arising in default risk management, and we provide applications of our decomposition result for the indifference pricing of defaultable claims, and the optimal investment under bilateral counterparty risk. The solutions are expressed in terms of BSDEs involving only Brownian filtration, and remarkably without jump terms coming from the default times and marks in the global filtration.

Miklós Rásonyi (University of Edinburgh) "Fragility of Arbitrage and Bubbles in Diffusion Models"

Abstract: We show that, in a large class of diffusion models for price processes, there is always another "arbitrarily uniformly close" model which is arbitrage- and bubble-free. Our result applies to some well-known examples such as the inverse Bessel process and certain stochastic volatility models and raises questions about how to view arbitrage and bubbles in financial markets. This is joint work with Paolo Guasoni.



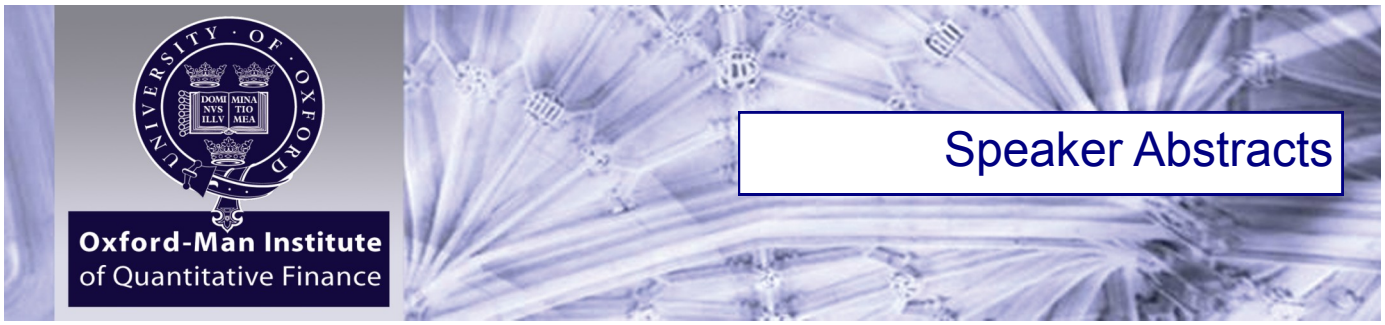
Wolfgang Runggaldier (Università delgi Studi di Padova) "Portfolio Optimization in Defaultable Markets under Incomplete Information"

Abstract: We consider the problem of maximization of expected utility from terminal wealth in a market model that may be driven by a not fully observable factor process and that takes explicitly into account the possibility of default for the individual assets as well as contagion (direct and information induced) among them. It is a multinomial model in discrete time that may be of interest in itself but may also be considered as an approximation of a continuous time model with the main advantage being the possibility to make explicit calculations also in complex situations. We discuss the robustness of the solution in our defaultable and/or partial information setup by considering optimal strategies that do not take these possibilities into account and by comparing the performance of the latter (computed via simulations) with that of our solution. Based on joint work with Giorgia Callegaro and Monique Jeanblanc.

Walter Schachermayer (University of Vienna) "A direct proof of the Bichteler-Dellacherie theorem related to arbitrage"

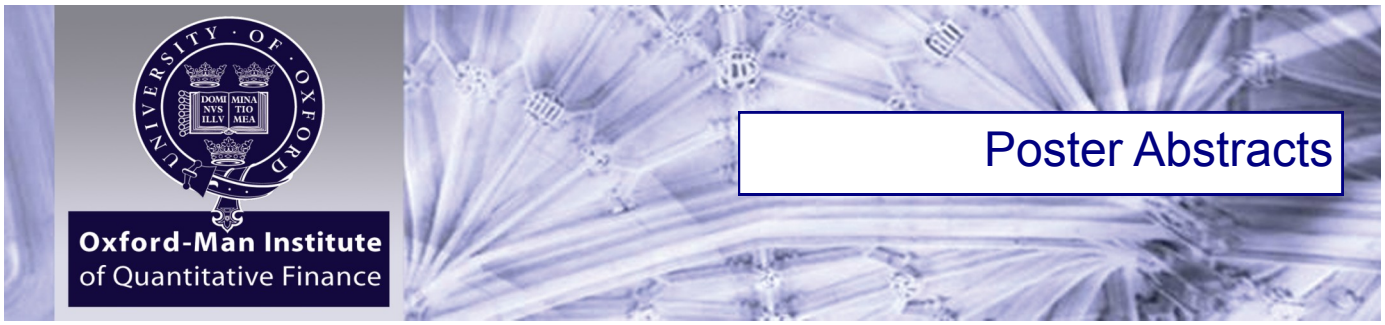
Alex Schied (Mannheim University) "Robustness and non-robustness in market impact modelling"

Abstract: Research on market impact has shown that the price impact of trades is mainly transient and often nonlinear. Several mathematical models have been proposed to describe these features quantitatively.
In this talk we will investigate how some qualitative properties of these models can change when we alter the model setup. In particular we will see that small changes in the description of transience can have significant effects on the behavior of the model. We will also discuss several ways to model nonlinearities in price impact and how they can affect the stability of models.



Raman Uppal (London Business School) "Keynes Meets Markowitz: The Trade-Off between Familiarity and Diversification"

Abstract: We develop a model of portfolio choice to nest the views of Keynes-who advocates concentration in a few familiar assets—and Markowitz—who advocates diversification across assets. We rely on the concepts of ambiguity and ambiguity aversion to formalize the idea of an investor's "familiarity" toward assets. The model shows that when an investor is equally ambiguous about all assets, then the optimal portfolio corresponds to Markowitz's fully diversified portfolio. In contrast, when an investor exhibits different degree of familiarity across assets, the optimal portfolio depends on (i) the relative degree of ambiguity across assets, and (ii) the standard deviation of the estimate of expected return on each asset. If the standard deviation of the expected return estimate and the difference between the ambiguity about familiar and unfamiliar assets are low, then the optimal portfolio is composed of a mix of both familiar and unfamiliar assets; moreover, an increase in correlation between assets causes an investor to increase concentration in the assets with which they are familiar *(flight to familiarity)*. Alternatively, if the standard deviation of the expected return estimate and the difference between the ambiguity of familiar and unfamiliar assets are high, then the optimal portfolio contains only the familiar asset(s) as Keynes would have advocated. In the extreme case in which ambiguity about *all* assets and the standard deviation of the estimated mean are high, then no risky asset is held *(non-participation)*. The model also has empirically testable implications for trading behaviour: in response to a change in idiosyncratic volatility, the Keynesian portfolio always exhibits more trading than the Markowitz portfolio, while the opposite is true for a change in systematic volatility. In the equilibrium version of the model with heterogeneous investors who are familiar with different assets, we find that the risk premium of stocks depends on both systematic and idiosyncratic volatility, and that the equity risk premium is significantly higher than in the standard model without ambiguity.



Beatrice Acciaio (Technische Universität Wien) "Risk Assessment for Uncertain Cash Flows: Model Ambiguity, Discounting Ambiguity, and the Role of Bubbles"

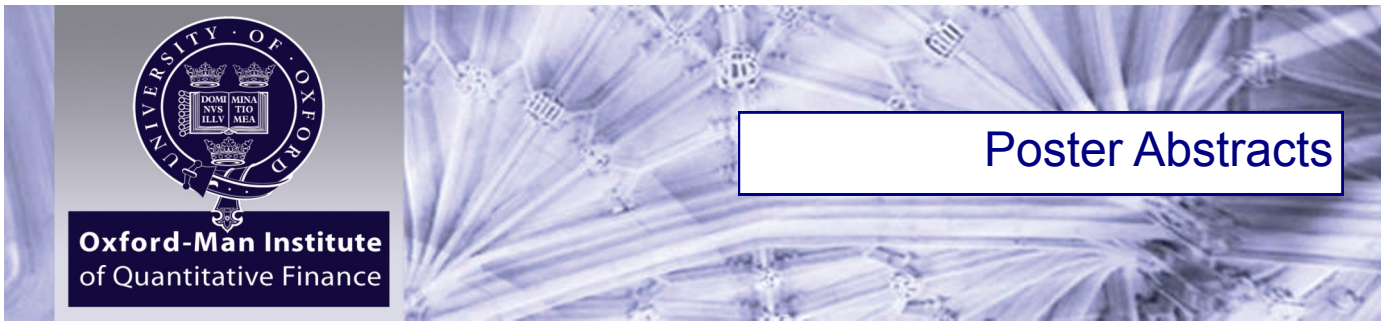
Abstract: We study the risk assessment of uncertain cash flows in terms of dynamic convex risk measures for processes. These risk measures take into account not only the amounts but also the timing of a cash flow. We discuss their robust representation in terms of suitably penalized probability measures on the optional σ-field. This yields an explicit analysis both of model and discounting ambiguity. We focus on supermartingale criteria for different notions of time consistency. In particular we discuss the appearance of "bubbles" in the penalty process, which may lead to an excessive penalization of relevant models and thus to an underestimation of the model risk. (based on a joint work with H. Föllmer and I. Penner)

Christa Cuchiero and Martin Keller-Ressel (ETH Zurich) "Affine Processes—Recent Results and Applications in Finance"

Abstract: We consider stochastically continuous affine process on the canonical state space $\mathbb{R}_+^m$ x $\mathbb{R}^n$ as well as on the cone of positive semidifinite symmetric matrices S_d^+. This large class of Markov processes unifies the concepts of Lévy processes, continuous-state branching processes with immigration and Ornstein-Uhlenbeck type processes. It is therefore particularly appropriate for robust modelling in finance. We provide some new results and financial applications, such as multivariate affine stochastic volatility models.

Marco Maggis (Università delgi Studi di Milano) "Dual Representation of Conditional Quasiconvex Maps"

Abstract: Quasiconvex analysis has important applications in several optimization problems in science and in particular in economics and finance, where convexity may be lost due to absence of global risk aversion. Quasiconvexity, i.e. the property $\rho(\lambda X + (1-\lambda)\, Y) \leq \max(\rho(X); \rho(Y))$, plays also an important role in the theory or risk measures, since it enforces the control of the risk but it allows diversification. Moreover, the classical notion of the certainty equivalent, both in the static and in the dynamic formulations, is an example of a not convex but quasiconvex map. The robust or dual representation of convex maps plays a central role in the theory of risk measuring, especially for its connections with uncertainty and ambiguity. We provide a general dual representation of quasiconvex dynamic maps $\rho : L_{F_t} \to L_{F_s}$ and show its application in the above mentioned topics. This generalizes the representation of dynamic convex maps and of static (real valued) quasiconvex functions.



Michael Monoyios (University of Oxford) "Utility-Based Valuation and Hedging of Basis Risk with Partial Information"

Abstract: We analyse the valuation and hedging of a claim on a non-traded asset using a correlated traded asset under a partial information scenario, when the asset drifts are unknown constants. Using a Kalman filter and a Gaussian prior distribution for the unknown parameters, a full information model with random drifts is obtained. This is subjected to exponential indifference valuation. An expression for the optimal hedging strategy is derived. An asymptotic expansion for small values of risk aversion is obtained via PDE methods, following on from payoff decompositions and a price representation equation. Analytic and semi-analytic formulae for the terms in the expansion are obtained when the minimal entropy measure coincides with the minimal martingale measure.

Simulation experiments are carried out which indicate that the filtering procedure can be beneficial in hedging, but sometimes needs to be augmented with the increased option premium, that takes into account parameter uncertainty, in order to be effective. Empirical examples are presented which conform to these conclusions.

Matthew Pristker (Federal Reserve) "Knightian Uncertainty and Interbank Lending"

Abstract: The collapse of the housing price bubble during 2007 and 2008 was accompanied by high interbank lending spreads, and a partial collapse in interbank lending. This paper models how Knightian uncertainty over risk exposures to the collapsed assets affects interbank lending spreads, and may have contributed to the collapse of interbank lending. Our main finding is that institutional aspects of the Fed Funds market in the U.S. help to make the performance of that market in terms of spreads and activity robust to Knightian uncertainty over risk exposures in many economic circumstances. However, in some circumstances the market may occasionally collapse — and when it does private incentives may be insufficient to restart the market. In some circumstances when markets collapse, government inspection of banks accompanied by the release of information about risk exposures can improve welfare by internalizing an externality associated with reducing economy-wide uncertainty during a crisis. Our results also show that policies that create better publicly available information on aggregate exposures of core banks within the financial system may also help reduce collapses due to uncertainty ex-ante. The success of "transparency initiatives" in restarting markets depends on the financial architecture of bank linkages. This suggests that public policy aimed at resuscitating markets ex-post should focus on both the initiatives and the optimal design of the ex-ante financial architecture.

An Ta Thi Kieu (Universitet I Oslo) "Stochastic Differential Games with g-expectations"

Abstract: In this paper, we initiate a study on optimal control problem for stochastic differential games under generalized expectation via backward stochastic differential equations and partial information. We first prove a sufficient maximum principle for zero-sum stochastic differential game problem. And then extend our approach to general stochastic differential games (nonzero--sum games), and obtain an equilibrium point of such game. Finally we give some examples of applications.

Oxford-Man Institute of Quantitative Finance

Getting to Oxford

By Air	By road, Oxford is 1 hour and 30 minutes from Heathrow airport. It is also only 2 hours from Gatwick, 1hour from Luton and 2 hours from Stansted airports. There are regular coaches from all airports. Coach services from Gatwick and Heathrow depart approximately every 20 minutes. Further details of these services can be found at www.oxfordbus.co.uk/main.php?page_id=23. For further details of services from other airports, please visit www.nationalexpress.com.
By Train	Oxford has a centrally located train station with regular services between London and Oxford. Further details can be found at www.nationalrail.co.uk
By Coach	Oxford has a centrally located bus station, details of services can be found at www.nationalexpress.com
By Road	Details of routes into Oxford can be found at: www.theaa.com/travelwatch/planner_main.jsp

Bus:	Oxford has a wide network of local bus services. For more information, visit: www.thames-travel.co.uk www.stagecoach-oxford.co.uk www.oxfordbus.co.uk/buses1.html
Taxi Information:	Local Taxi firms include: • ABC Taxis, Tel: +44 (0)1865 770077 • Royal Cars, Tel: +44 (0)1865 777333 • 001 Taxis, Tel: +44 (0)1865 240000
Parking:	Parking is available in the city centre and can be found by following signs locally. However, a Park and Ride service also operates on the four main approaches to the city. For further details, please see: www.oxford.gov.uk/files/seealsodocs/28467/Park%20and%20Ride%20map.pdf

Oxford-Man Institute of Quantitative Finance

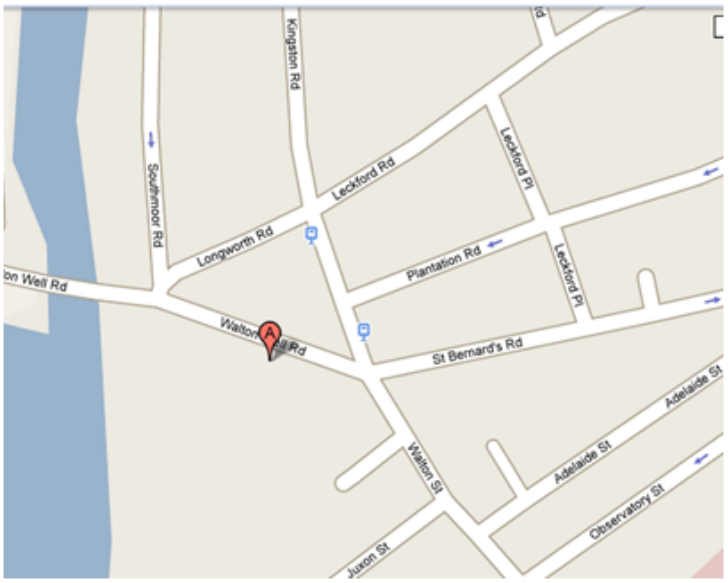
Day Venue

Locating the Oxford-Man Institute - Day Venue

Oxford-Man Institute Address and Contact Details	
Address:	**Oxford-Man Institute** Eagle House Walton Well Road Oxford OX2 6ED
Website:	www.oxford-man.ox.ac.uk
Email:	events@oxford-man.ox.ac.uk
Telephone:	01865 616600

Locating the Oxford-Man Institute

The Oxford-Man Institute is located in Jericho and is about a 20 minute walk from the train station. (Full map of Oxford can be found at http://www.dailyinfo.co.uk/sheet/maps/2008/by-day-2008.pdf)



Oxford-Man Institute of Quantitative Finance

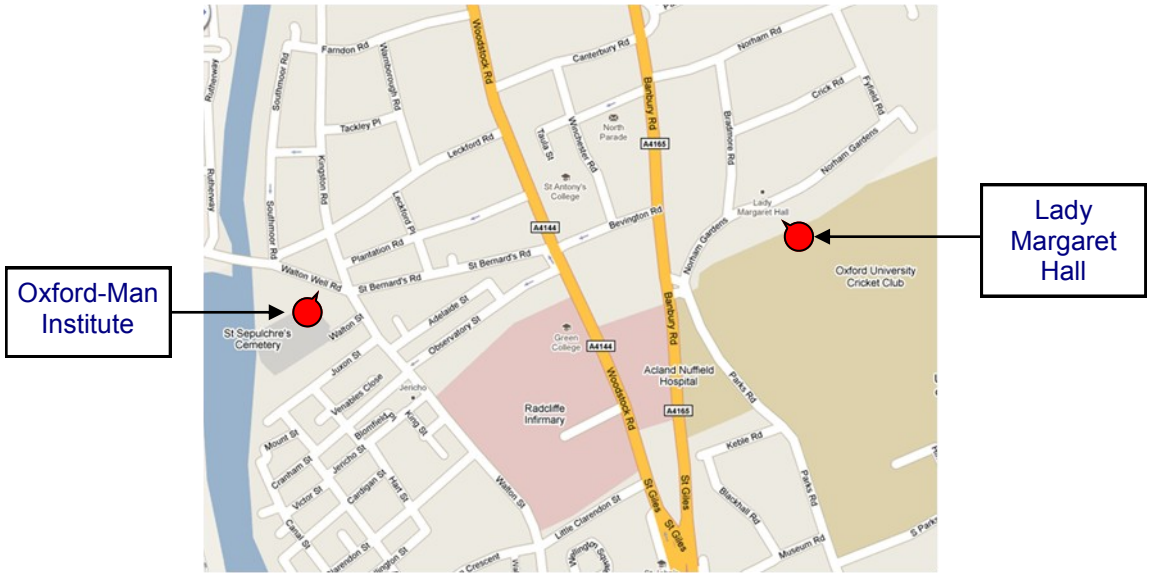
Dinner Venue

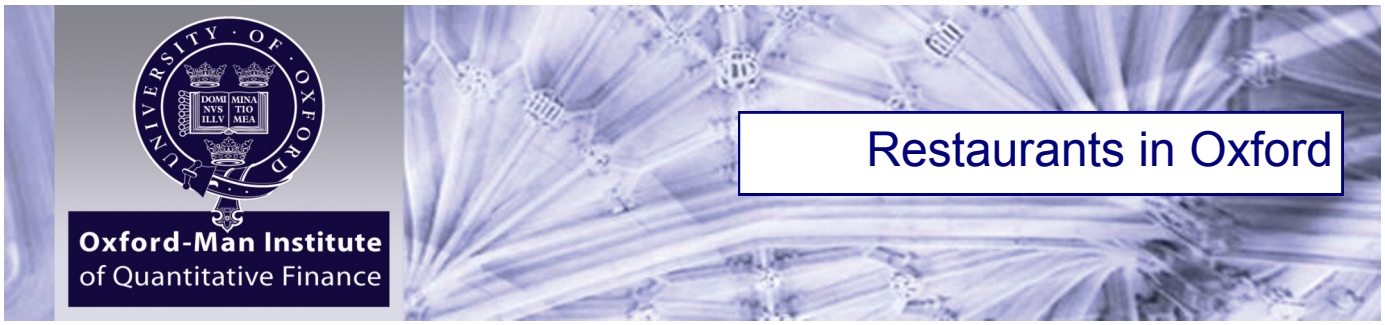
Locating Lady Margaret Hall—Dinner Venue

Lady Margaret Hall Address and Contact Details	
Address:	**Lady Margaret Hall** Norham Gardens Oxford OX2 6QA
Website:	www.lmh.ox.ac.uk
Telephone:	01865 274300

Locating Lady Margaret Hall

Lady Margaret Hall is located on Norham Gardens.

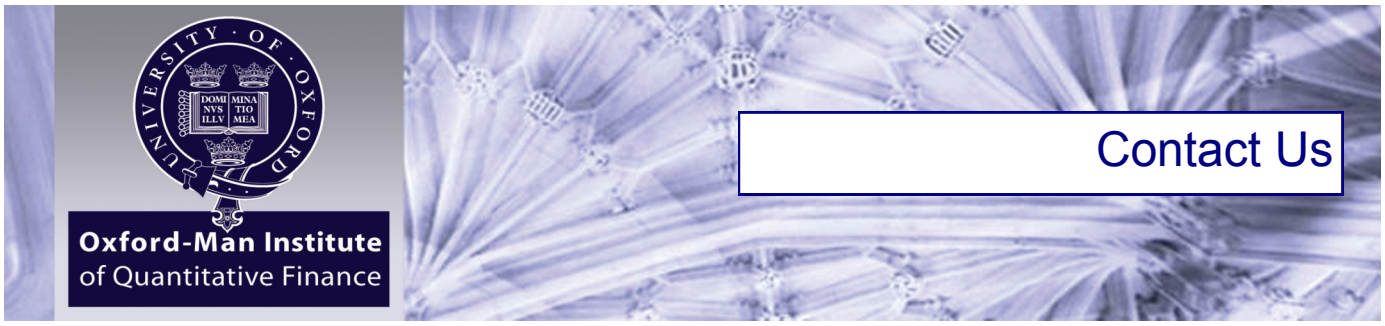




Name	Style of Food	Contact Details
Aziz Pandesia	Asian	1 Folly Bridge, Oxford, OX1 4LB 01865 247775
Branca	Italian	111 Walton Street, Oxford, OX2 6AJ 01865 556111
Cherwell Boathouse	International	601 Bardwell Road, Oxford, OX2 6ST 01865 552746
Edamame	Japanese	15 Hollywell Street, Oxford, OX1 3SA 01865 246916
Gees	Modern British	61 Banbury Road, Oxford, OX2 6PE 01865 553540
Las Iguanas	Latin American	40-41 Park End Street, Oxford, OX1 1JD 01865 263150
Le Petit Blanc	French	71-72 Walton Street, Oxford, OX2 6AG 01865 510999
Loch Fyne	Seafood	55 Walton Street, Oxford, OX2 6AE 01865 292510
Malmaison	French	3 Oxford Castle, Oxford, OX 1AY 01865 268400
Old Parsonage Hotel	European / Seafood	1 Banbury Road, Oxford, OX2 6NN 01865 292305
Quod Brasserie and Bar	Mediterranean	92-94 High Street, Oxford, OX1 4BJ 01865 202505
Randolph Hotel	Traditional	Beaumont Street, Oxford, OX1 2LN 0870 400 8200
Shanghai 30s	Chinese	82 St Aldates, Oxford, OX1 1RA 01865 242230

Things to do in Oxford

Attraction	Location and Telephone Number	Details
Museums		
Ashmolean Museum	Beaumont Street Tel: 01865 278000	One of the oldest public museums in the world. Opening Hours: Tues-Sat and Bank Holiday 10am -5pm, Sun 12-5pm. Late openings on Thursdays in the summer. Admission free.
Natural History Museum	Park Road Tel: 01865 272950	Dinosaur skeletons and live invertebrate exhibits. Opening Hours: 12 - 5pm every day. Admission free.
Museum of the History of Science	Broad Street. Tel: 01865 277280	Opening Hours: 12-4pm, Tues to Sat; 2-5pm Sun. Admission free.
Christ Church Picture Gallery	Christ Church (entrance via Canterbury Gate / Oriel Square). Tel: 01865 276172	Changing selections from the college's collection of Old Masters' drawings and paintings. Opening hours: Mon-Sat 10.30-1. 2-4.30; Sun 2-4.30. Adults-£2, Conc-£1
Colleges		
Christ Church	St. Aldate's. Tel: 01865 276150	Founded by Cardinal Thomas Woolsey.
Magdalen	High St. Tel: 01865 276000	Founded originally in 1448.
Green Spaces		
Christ Church Meadow	St. Aldate's	A walk through meadows along the river
University of Oxford Botanic Gardens	Rose Lane 01865 286690	Founded in 1621 for the study of medicinal plants, Oxford's Botanic Gardens are the oldest of their type in Britain,



Events at the Oxford-Man Institute

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