

FMG Research Students: a Retrospective

An ESRC funded conference
11-12 November 2004

The Financial Markets Group held a special conference to mark the completion of its 10-year ESRC Research Centre Award. The conference was devoted to the Centre's role in the training of young researchers and career development and it brought together leading academics and practitioners and drew on papers from the Financial Markets Group's doctoral members.



Retrospective Conference

Statement from FMG Director

This conference was a celebration of an aspect of the FMG's achievements during my directorship, which has included 10 years as an ESRC Research Centre. Much of FMG's success and reputation is owed to the commitment of its graduate students, many of whom have gone on to achieve success and distinctions both in academia and in industry. A number of our students are today attending this event which is to celebrate what the ESRC, to some of the evaluations of the of the Centre's work throughout its sponsorship period, described as 'a successful training strategy'.

On average, in each year of FMG's history 4 students have obtained their PhDs, and our working paper and publication series serve as a testament to the quality of their work. The range of output produced in corporate finance, financial econometrics, market microstructure and the innovative applications of microeconomics to general finance theory, is a source of great pride to the Financial Markets Group and its faculty. Although much of this work relied on the hard work of our outstanding students, our success in FMG's training endeavours owes much to a number of committed academics, whose names appear in the acknowledgment pages of the PhD theses of our students. On behalf of the FMG students, staff and members linked to this group we would like to thank them for their contribution.

The current pool of able graduate students attached to this group give us confidence that the tradition of training and high quality education provided in LSE through the Financial Markets Group will continue in the future.

Professor David Webb

Director, Financial Markets Group



D C Webb, Director, FMG

FMG Research Students: a Retrospective

The opening session was chaired by **John Moore** (University of Edinburgh and LSE) and saw **Denis Gromb** (London Business School) present the paper 'The organization of delegated expertise', joint work with David Martimort (Université de Toulouse). Gromb firstly discussed some of the properties an optimal contract should possess in the setting of delegated expertise. The contracting problem is especially complex as it is affected by both moral hazard (ex-ante) and adverse selection (ex-post). The moral hazard arises as the principal cannot observe whether the expert acquired information or not. The authors also assume limited liability, which makes the problem of incentive provision interesting, given the assumption of risk neutrality. Moreover the information received by the expert is soft, therefore it is non verifiable and able to be manipulated.

In order to solve the moral hazard problem, Gromb argued that payments should be made contingent on the quality of the signal, but this creates incentives to manipulate the information, which generates the adverse selection problem. When deriving the optimal contract in this setting, the authors focus on organizational aspects, in particular on the question whether it would be optimal to let a single expert observe more signals, or to have one expert specializing on gathering one signal only, even if more informative signals were available. The authors show that the second situation would be optimal as there are diseconomies of scale in the provision of incentives both to gather information and to report the information truthfully. Finally the authors introduce the possibility of hiring a second expert and allow for the possibility of collusion. The authors discuss the optimal organizational responses depending on how robust the organization is to the threat of collusion. Finally the authors analyse the possible benefit of using sequential reporting of information. They show that using two experts rather than one would be strictly optimal.

This paper also analyses the problem of providing incentives for experts to gather and report information. Another novel aspect of the paper is the discussion of organizational responses to this agency problem.

Vicente Cuñat (UPF) then presented the paper 'Executive Compensation and Competition in the Banking and Financial Sectors', representing joint work with Maria Guadalupe, (Columbia University), which investigates how changes in product market competition affect executive compensation. In order to measure the effect of product market competition on performance related pay sensitivities, they use quasi-natural experiments to isolate the causality from competition to pay and consider two historical events. Firstly they consider the deregulation of the banking sector, which occurred in 1994, and secondly they examine the deregulation of financial services in 1999. They analyse compensation data for the top 5 executives of the top

1500 US firms (S&P 1500), over the period 1992-2002. The results of the experiments show higher performance-pay sensitivity after the 1999 deregulation and a stable positive effect for the 1994 deregulation. The innovative aspect of this study relies on the fact that the above result does not come from strategic commitment or rent extraction explanations that currently exist in the literature. Moreover, deregulation increases the total sensitivity of option grants relative to the control groups.

The last presentation of the morning, presented by **Raoul Minetti** (Michigan State University), was on 'Informed Finance and Technological Conservatism'. Minetti presented a model that challenges the conventional view that 'informed finance' fosters technological progress. When evaluating a project, a lender collects a lot of information on various aspects of the project, including the management of the firm, the production process and the firm's productive assets, for example. The information that is collected is specific to the technology adopted and thus the lender expects its value to depreciate when the new technology is used. This can render an informed lender 'conservative' when financing new technologies. In other words, the lender hinders new technologies to preserve the value of her information.

Two types of lenders are characterised in the model, one which gathers deep information over time (called 'relationship' financiers) and another, which gathers less information (called 'transactional' financiers). The firm's choice between 'relationship' and 'transactional' financiers is essentially a trade off between freedom in technology adoption and inexpensive financing of mature technologies. In an economy with perfect contractual enforceability, the lender could commit to allow adoption of the new technology, or the firm could compensate the lender for the depreciation of her information by committing to paying higher returns. However, under the model's assumption of imperfect enforceability these commitments are not credible and the informed lender vetoes the adoption of new technology.

Minetti concluded by discussing two applications of the model. The first provides an explanation for the fact that as an economy becomes more developed, the information of banks becomes more specific, banks become more conservative and firms switch to securities markets. The second application relates to the cross-country differences in the historical development of new industries and seeks to explain the casual evidence that in the last two centuries many industries developed first in countries with a market-oriented financial structure such as the USA and UK rather than in bank-oriented systems like Germany and Japan.

The first presentation of the second session, chaired by **Ian Tonks** (Exeter University), was given by **Alexander Muermann** (Wharton, University of Pennsylvania) and was entitled 'Spot Market Power and Futures Market

Participation'. This represented joint work with Stephen Shore (Wharton, University of Pennsylvania) and showed how the existence of futures traders with spot market monopoly power can discourage participation in a competitive futures market.

The key element is that spot market power creates a moral hazard problem for the monopolist. A risk-averse spot market monopolist who also trades on a competitive futures market will want to hedge shocks to demand by taking short positions in the futures market. After entering into these short futures positions, the monopolist has an incentive to reduce spot prices by increasing production to make his futures market positions more profitable. As a result, other market participants might fear the presence of monopolists in the futures market and decrease their market participation.

In their basic model, the authors analyse the interactions between a monopolist and risk-neutral market makers. If the monopolist is risk-neutral he does not participate in the futures market, he produces monopoly output, and sells it at monopoly prices in the spot market. If the monopolist is risk-averse and futures contracts can be made contingent on realized demand, the monopolist could completely eliminate all risk and maintain his full market power in the spot market. If such contracts cannot be written, the monopolist will participate in the futures market, give up some monopoly power on the spot market, but will not be able to hedge perfectly.

In the extended set-up there are three groups of players: a monopolist, competitive market makers, and many risk-averse hedgers. If the market can infer the monopolist's presence from aggregate order flow, the monopolist does not participate in the futures market in equilibrium and hedgers hedge themselves perfectly. If the monopolist can hide in the order flow, then it is optimal for him to participate in the futures market to realize higher profits. In this case, hedgers participate in the futures market as well but they cannot hedge in full.

The study is motivated by the functioning of the oil market. Futures markets in oil are thin and – contrary to what one would expect – only American oil is traded while Middle East oil is not. A similar situation applies to CAT bond markets. CAT bonds are currently much more index triggered rather than indemnity triggered. Similar to oil, this might be explained by the monopoly monitoring powers that insurers and reinsurers can exercise.

Vittoria Cerasi (Università degli Studi di Milano-Bicocca) then presented the paper 'Multiple-bank Lending: Diversification and Free-riding in Monitoring', joint work with Elena Carletti (Center for Financial Studies) and Sonja Daltung (Sveriges Riksbank). The paper discusses the choice made by banks of whether to share the lending to individual firms with other banks. The theoretical literature suggests that firms should borrow from a single bank to optimise effective monitoring. This is due to problems of free-riding on the other banks' efforts, and inefficiencies arising from the duplication of efforts. Interestingly, in practice the opposite is true, with most firms opting for multiple banking relationships. The authors tackle this discrepancy between theory and observed evidence by modelling the bank's

choice of whether to engage in multiple lending with other banks.

The authors construct a theoretical model where the bank must choose between lending solely to a firm or sharing the loan with another bank. With a limited lending capacity, and a leveraged structure, the bank must offer a return to its investors and choose an optimal monitoring level.

The main contribution of the paper is a model that explains the use of multiple-bank lending that focuses on banks' monitoring incentives. The attractiveness of multiple-bank lending decreases with the firm's profitability and with the bank's inside equity, and increases with the cost of monitoring. The model predicts that multiple-bank lending should increase when banks are small relative to the projects they finance.

Gilles Chemla (Sauder School of Business) concluded the first day by presenting the paper 'The Dynamic Trade-Off Theory with Real Investment: An Analytical Approach'. Under the traditional static trade-off theory of capital structure, leverage is determined by balancing the benefits of debt tax shields against bankruptcy costs at the margin. However, this theory faces a number of well-documented empirical challenges. For example, under this view direct bankruptcy costs appear quantitatively insufficient to account for observed low corporate debt levels. In addition, the theory encounters difficulties in explaining the negative correlation between profitability and leverage and the sensitivity of firm investment to cash flows. In this paper Chemla takes up the challenge to develop a trade-off theory that can provide theoretical predictions consistent with these empirical regularities.

The model that is developed uses a dynamic capital structure with real investment in the presence of corporate debt tax shields and bankruptcy costs. The model is sufficiently simplified to allow for closed-form solutions (in contrast to the existing literature on dynamic capital structure with real investment which relies on numerical simulations). Furthermore, in contrast to the standard trade-off theory, the model incorporates the differences in the tax treatment of interest payments and the principal (which is never repaid in the standard theory) at the time of bankruptcy. This leads to a lower, more empirically reasonable leverage level than would be predicted by the standard trade-off model. It can also be shown that output price dynamics in the model can generate empirically consistent patterns in the correlations between, for example, cash flow and investment and leverage and profitability. The model could also be extended, being combined with corporate finance agency effects and could incorporate other features, such as risk aversion rather than risk neutrality, the potential for strategic default and different debt maturities.

The first session on Friday was chaired by **Ian Jewitt** (Nuffield College, Oxford) and started with **Markus Brunnermeier** (Princeton University) who presented the paper, 'Do Fluctuations in Wealth Generate Time-Varying Risk Aversion? Micro-Evidence on Individuals' Asset Allocation'. This represented joint work with Stefan Nagel (Stanford University). In the recent theoretical literature, it has been proposed that the excess volatility and the predictability of stock

FMG Conferences

returns can be explained by the changing risk-aversion of the representative agents. These papers argued on various grounds that as households' wealth level increases, their risk-aversion should increase as well. This co-movement would explain why expected returns move counter-cyclically in aggregate data. Brunnermeier and Nagel's work analyses household level data to test whether or not there is indeed a positive relationship between changes in stockholdings and changes in wealth at the individual level.

Their main result is that there is no such positive relationship. Apparently, the fraction of financial wealth allocated to stock holdings is unrelated to wealth shocks, or – if anything – it is negatively related. In contrast, they present evidence that inertia has a dramatic impact on asset allocation, whereby households do not rebalance following capital gains and losses on their risky asset holdings. Past capital gains therefore have a substantial effect on the portfolio of the typical household even five years into the future. Individual asset holdings then depend on the past path of prices; hence they are arguably quite idiosyncratic.

The authors suggest that there could be other micro foundations, which would explain the variation in risk-aversion at the aggregate level. Their finding of inertia can be driven by a combination of transaction costs, cognitive costs, and limited attention. Alternatively, capital gains and losses might change household preferences, similar to models with a narrow framing of risk, or they might change beliefs about future returns which generates trend-chasing behaviour.

The morning session resumed, now chaired by **Vassilis Hajivassiliou** (LSE), with **Enrique Sentana** (FMG and CEMFI) talking about 'Estimation and Testing of Dynamic Models with Generalised Hyperbolic Innovations', co-authored with J Javier Mencia (CEMFI). The paper proposes a framework for fat tails and asymmetries in multivariate conditional heteroskedastic dynamic regression models. This framework is more general than recent developments using the Student t-distribution for allowing asymmetries in the innovations, highly relevant due to the co-dependence in asset returns, especially in bear markets. The empirical relevance of the model is illustrated using a dataset on UK sectoral stock returns, for which strong evidence of conditional skewness is found.

Francisco Peneranda (University of Alicante) then presented 'Quantitative Analysis of Return Dynamics under Coordination Failure', representing joint work with Jon Danielsson (FMG, LSE). Coordination failure has recently been proposed as a reason for extreme events in financial markets. In their paper, the authors take this as a starting point and develop a simple multi-period extension of a model proposed by Morris and Shin that serves as the data-generating process in their econometric work. In the model, a continuum of strategic traders maximize one-period returns by making a binary decision about going long or short, while being faced with noise traders. Strategic complementarities arise, which in turn produces a failure to coordinate. The end result is therefore a model in which speculative attacks occur when a large proportion of traders decide to go short or long

simultaneously. This produces extreme returns and hence produces kurtosis in the return distribution. The authors then estimate the model using simulation-based indirect inference on Yen/Dollar data for 1997-1998, and show that the model or data-generating process is able to replicate some of the features of the data quite well.

The final session of the conference was chaired by **Bob Nobay** (FMG, LSE) and saw **Heski Bar-Isaac** (NYU) present a joint paper with Vicente Cuñat (UPF) on 'The Simplicity of Long Term Debt with Multiple Sources of Funds'. The starting point for this paper is the fact that even though there are multiple sources of financing available both for firms and consumers, 'expensive' forms of debt appear to be used even before the cheapest ones are exhausted.

Bar-Isaac explained how this paper offers an explanation for this empirical puzzle by using a two-period model of adverse selection where two sources of financing coexist: a competitive banking sector which pools information and an alternative sector that exchanges no information with the competitive sector and that lends at an exogenous and fixed interest rate. Borrowers start by obtaining a long-term loan from the banking sector and sign a contract that specifies payments for both periods. This happens before they learn their income in the interim and final periods. However, when they learn about their income, which happens prior to the interim period, they have the chance to cancel the loan or otherwise repay it through realised income or other loans that can be obtained from any of the two existing sources of financing. In the final period, the borrower repays all outstanding loans if she has sufficient funds, or else defaults and consumes nothing.

The authors show that if the alternative sector interest rate is high enough then the equilibrium borrowing from the transparent competitive sector is efficient and fully separating between types. Otherwise borrowing is through both sectors and all types that borrow, borrow from both sectors though only one lending contract from the transparent competitive sector is observed in equilibrium. The key element of the model is that since the alternative sector does not disclose any information concerning loan applicants, a borrower might be tempted to borrow from this source in order to disguise her type.

Finally, they show that lower alternative sector interest rates decrease welfare as this encourages a greater number of inefficient types to continue borrowing funds at the interim stage rather than terminate the debt contract.

The second paper in the afternoon session, 'Reputation Effects in Trading on the New York Stock Exchange', was presented by **Andrew Ellul** (Indiana University) and represented joint work with Robert Battalio (University of Notre Dame) and Robert Jennings (Indiana University). Ellul started by explaining a few institutional details of the NYSE, in particular the differences between anonymous, electronic trading platforms and traditional floor-based trading. In recent years, electronic trading has emerged as the dominant form of executing transactions, to such an extent

that some now believe non-anonymous floor-based traders could become redundant. However, Ellul noted that floor-based trading provides lower costs for large/difficult orders since by trading face-to-face, the specialist can obtain extra information about who is trading and how urgently they need to trade, for example.

These reputation effects naturally follow from the repeated interaction between traders and will prevent brokers from exploiting the specialist, since to do so will result in the specialist punishing them later on, through larger spreads for example. Face-to-face interaction therefore reduces the problem of asymmetric information, allowing the specialist to reduce his spreads relative to what would be seen in purely anonymous trading platforms. The authors test this reputation hypothesis by analysing the spreads offered by specialists around times when the specialist moved from one part of the trading floor to another.

They find that in the days leading up to the move, quoted spreads increased significantly, since the specialist could no longer credibly threaten to punish brokers who exploited their informational advantage. Immediately after the move, spreads remained higher than usual but soon moved back to 'normal' levels. These higher post-move spreads are explained by the specialist having a new clientele of brokers, where relationships have not yet been developed. The authors also find that the increase in spreads around moves was much higher for stocks where the problem of information asymmetry was larger. Brokers who followed the specialist were also found to receive lower spreads; further evidence of the reputation hypothesis.

The final presentation of the afternoon was given by **Robert Kosowski** (INSEAD), who presented the paper, 'Are Stellar Hedge Funds for Real', joint with Narayan Naik (LBS). The aim of this paper is to answer a number of questions, including: Is the performance of hedge funds due to luck and data biases? If not, does it persist? and can investors benefit by placing money with 'good' managers? When examining these issues, the authors examine a comprehensive hedge fund database using a robust bootstrap method and a Bayesian framework.

The understanding of the risk-return trade-offs of different hedge fund strategies has improved significantly in recent years. Specifically, it is now known that hedge fund returns relate to conventional asset returns in a linear as well as an option-like way. They also relate to the difference in the returns of small-cap-large-cap spreads and credit spreads. More importantly, a significant part of the variation in hedge fund returns over time can be explained by systematic risk factors.

These insights enable analysts to segregate hedge fund returns into two components: one that can be explained by exposure to systematic risks (the market risk component), and another that cannot be explained by systematic risk factors (the manager specific component). The former represents reward for bearing market risk, while the latter represents reward that can be attributed to manager skill. In this paper, the authors test whether the non-systematic component of returns is purely due to

luck. They ask whether it shows persistence and test whether it is possible to construct a trading rule that can capture these returns.

Across all measures, the authors' bootstrap tests indicate that, controlling for sampling variability (luck), there exist superior hedge funds that beat their benchmarks (net of expenses) by an economically and statistically significant amount. However, they find that a large number of hedge funds that show statistically significant alphas are small in size and potentially closed for new investment. This suggests that although there may be genuine alpha, not many investors can exploit it due to issues related to capacity constraints.

The authors then examine whether these high-alpha funds persist. The results indeed show that funds with high alphas tend to have high alphas in the future. This is true over formation horizons from one to four years. Further, after removing the effects of extreme data points, the alpha differences between the best and worst funds strongly persist over the same horizons. However, again it is difficult for an investor to take advantage of this persistence as the top funds tend to be very small and may be effectively closed to new investment.

To conclude the conference, a panel discussed how communication between the research community and practitioners has evolved over the past few years, and asked which were the next steps to follow. The panel, chaired by **David Webb** (FMG, LSE), was composed of **Richard Brealey** (LBS), **Vasant Naik** (Lehman Brothers International), **Gennotte Gerard** (FMG, LSE), **Jamil Baz** (Deutsche Bank) and **John Moore** (University of Edinburgh and LSE).

It was widely agreed that the subjects studied in academic environments have become more relevant and useful to *real world* economics over recent years. As an example of these two areas moving closer, Brealey highlighted the fact that the value of an average PhD student in Economics or Finance has overtaken that of an average MBA student.

However, discrepancies arose when the panel moved to discussing how these two worlds could be encouraged to converge and be more useful for one another. The banking sector complained about scientists lying at two extremes: either being too vague in answering daily life problems, or else making unrealistic assumptions on the processes analysed. As Baz pointed out, the solution lay somewhere in between, ie in open-minded people capable of performing rigorous analysis. To achieve the latter, Naik stressed the fact that a solid theoretical basis is needed to understand financial markets, and that this is one of the main assets provided by the research community.

From an alternative perspective, Moore stated that research should focus on macro/aggregate phenomena rather than dismiss high frequency issues. To do so, he encouraged people to be more ambitious and to think in a more abstract way: 'we must allow our theories to flow freely, only then will they be provocative and, finally, common sense'.

Tommaso Padoa-Schioppa:

Regulating Finance

8 December 2004

On 8th December 2004, the FMG hosted a conference, organised by Charles Goodhart, to honour Tommaso Padoa-Schioppa. The conference included distinguished contributors who discussed analytical and policy issues relating to Financial Regulation.

Tommaso Padoa-Schioppa has been a member of the Executive Board of the European Central Bank since 1998. From 1979 to 1998 he served the European Monetary Community in a variety of capacities. He has also been affiliated with the Bank of Italy since 1968.

The first paper was presented by **Dimitrios Tsomocos** (Bank of England). The paper, entitled 'Models of Financial Fragility', co-authored with **Professor Charles Goodhart** (FMG, LSE) introduces a model to assess the risks facing banks. Its main innovation is to incorporate the endogenous interaction between banks, recognising that the actual risk to which an individual bank is exposed also depends on its interaction with other banks and other private sector agents. To this end, the authors develop a two-period general equilibrium model with three active heterogeneous banks, incomplete markets, and endogenous default. The setting of three heterogeneous banks allows the authors to study not only interaction between any two individual banks, but also their interaction with the rest of the banks in the banking system. The authors show that the model is analytically tractable and can be calibrated against real UK banking data and therefore can be implemented as a risk assessment tool for financial regulators and central banks. They address the impact of monetary and regulatory policy as well as credit and capital shocks in the real and financial sectors.

Rafael Repullo (CEMFI and CEPR) then presented 'Economic and Regulatory Capital. What is the difference', representing joint work with **Abel Elizalde** (CEMFI and UPNA). The authors analyse the determinants of regulatory capital (the minimum required by regulation) and economic capital (the capital that shareholders would choose in the absence of regulation) in the context of the single risk factor that underlies Basel II. The results show that economic and regulatory capital do not depend on the same set of variables and that they react differently to changes in their common determinants. For plausible parameter values, they are both found to increase in the loan's probability of default and the loss given default.

Variables that affect economic but not regulatory capital, such as intermediation margin and the cost of capital, are also shown to move them significantly apart. The results also show that market discipline, proxied by the coverage of deposit insurance, increases economic capital, although the effect is generally small.

The next paper was presented by **Jukka Vesala** (ECB), joint work with **Reint Gropp** (ECB), and was entitled 'Deposit Insurance, Moral Hazard and Market Monitoring'. Vesala proposed that the effects of regulating deposit insurance were not yet clear. On the one hand, it may generate incentives for excessive risk taking by banks; depositors lose their incentive to monitor them, which results in banks not adjusting their position in response to changes in risk. On the other hand, meaningful and explicit deposit insurance may signal that banks may not always be bailed out, which will enhance the incentives to monitor by the bank's creditors that are not insured. In this paper the authors attempt to clarify this issue. Using a panel of EU banks they show that the second effect prevails, ie explicit deposit insurance reduces the risk taken by banks. They also show that this effect is not present for large banks because they are 'too big to fail'.

The afternoon session started with **Julian Franks** (LBS) presenting 'Asset Management and Investor Protection', which represented joint work with **Colin Mayer** (Oxford). The paper gives an overview of the global asset management industry with a special focus on the UK, noting that of the £42 trillion under worldwide management, approximately £3 trillion is managed within the UK. Franks discussed the main risks and sources of losses in the industry, arguing that the two most significant risks were misleading transactions by the asset manager, and a breach of client guidelines. When discussing the differences in investor protection between continental Europe and the UK, the UK was characterised as having limited capital requirements and more stringent compensation for poor advice on contractual failure. Finally, the UK was identified as a very expensive location (both in labour and property terms) for the middle/back office operations of asset managers. The authors pointed to the growing trend of asset managers moving to locations elsewhere, such as Dublin as a more attractive location to run these operations.

'Current issues in European Banking Supervision' was then presented by **Harald Benink** (Chairman of the European Shadow Financial Regulatory Committee), who centred his discussion on two main points: Basel II and its implementation, and the home/host country supervision conflict. Regarding the former, he highlighted the shift in emphasis to pillar II that the Basel committee has implemented, and especially the concern that they show about the reliability of internal ratings. On the latter, he pointed out that current regulations might become problematic. They establish that the home and the host supervisory authorities have to reach an agreement on the supervisory procedure of the foreign banks before six months, otherwise all the decision power goes to the home authority. He showed that this solution might not be optimal in countries with a huge presence of foreign banks like those in eastern Europe. As a possible alternative, he proposed that when the supervisory authority of the home country makes the final decision, it also takes the responsibility of bailing out the bank.

Callum McCarthy (Chairman of the UK's Financial Services Authority), in his discussion on 'How do we achieve regulatory convergence in practice?' took up one of two reform proposals put forward by Tommaso Padoa-Schioppa in relation to the internationalisation of financial activity within the EU (with the second being a European regulatory rule book). Regulatory convergence aims to reduce the potential for duplication or inconsistency of supervision and regulation when institutions operate across jurisdictions. Under the concept of a home or lead regulator, a financial institution is regulated by the authorities in its 'home' country, for example, its country of incorporation. In which case, the 'host' regulator cedes responsibility for supervision of the institutions' operations under their jurisdiction. Whilst supporting the principle of reducing the supervisory burden, McCarthy highlighted the practical complexities of such a move. For example, how one deals with questions that are raised over the legitimacy of the host regulator, the potential differences across countries in regulatory powers, methods and competence, and how one deals with bank failures under such a system. He then discussed how to operationalise this concept, noting the progress that had already been made. First, he argued that there should be recognition that not all financial institutions pose the same risk. For systemically important institutions in the host country, amendments should be allowed to enable the host regulator to have influence and even rights in the home regulator's decision. Second a series of protocols on the exchange of information and supervisory practices should be developed. For example, these would build on the current practice of supervisory 'colleges' meeting to discuss specific large international institutions. In conclusion, he argued that such approaches could provide a practical way to move towards the highly desirable objective of regulatory convergence.



Tommaso Padoa-Schioppa, ECB

Tommaso Padoa-Schioppa (ECB) concluded the conference with the presentation of 'Regulatory Finance: Balancing Freedom and Risk', also the title of his book. Schioppa described the two main facets of his book: the shift toward a more quantitative and mathematical framework for the analysis of risk and regulation, and a policy shift toward more

complex forms of regulation and supervision. He then applies the framework to the study of the European case of central banking regulation and supervision. Schioppa describes the significant structural and mechanical shifts in the process, whereby central banks regulate and supervise financial institutions. The increase in trade, the development of sophisticated payment systems and the increased developments in technological innovation have served to provide a challenging landscape for central bankers. For example, the immediacy of information has led to a significant decline in the time available for decision making by central bankers. Whereas the concept of time was measured in months, now it is measured in days, and sometimes hours.

The increasing globalisation that has led to an increase in cross-border transactions has meant that financial transactions are increasingly more complex. Issues of legal jurisdiction, currency risk and information asymmetries arising from geographical segmentation are common factors in modern day financial transactions. The increasing complexity of these transactions has led to more challenging roles for regulators. Overall, central banks have adopted a more market-friendly approach categorised by a market with increased transparency, greater self-regulation and growing de-segmentation. Finally he presented the challenges for future regulators: excessively friendly attitude towards the market, and the right balance between a restrictive regulatory environment and one that allows innovation and growth in the financial sector.

Public Policy Perspectives on Pensions Reform

The Financial Markets Group of the London School of Economics and Political Science is organising a series of events on the occasion of the recent publication of the first report of the Pensions Commission.

Supported by the
UBS Pensions Research Programme at LSE

7 February 2005

Public lecture

Axel Boersch Supan, University of Mannheim
5.30pm, Hong Kong Theatre, LSE

8 March 2005

Public lecture

Adair Turner, Chairman, Pensions Commission
6.30pm, Hong Kong Theatre, LSE

11 March 2005

Conference

Public Policy Perspectives on Pensions Reform

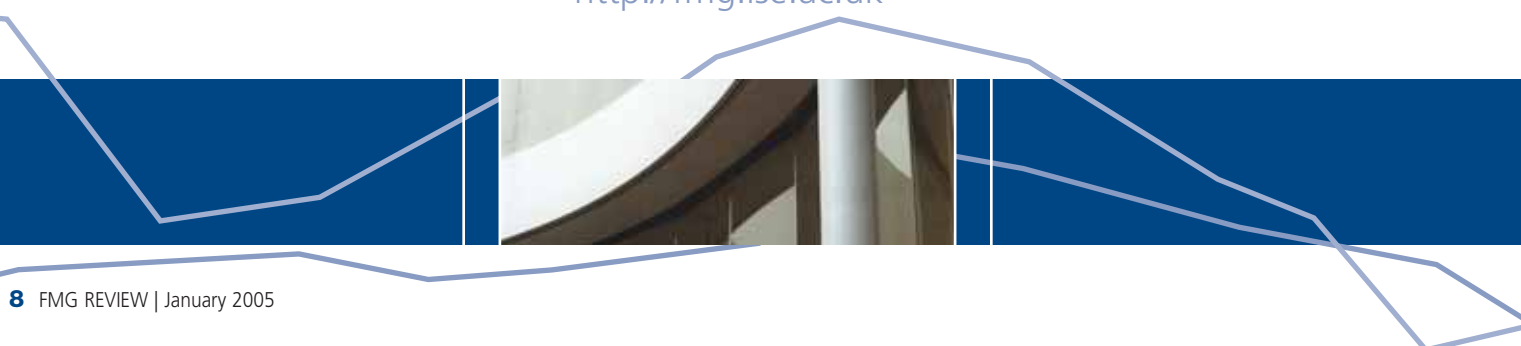
From 9.30am, Financial Markets Group, Conference Room, R405, LSE

Contributors include:

Alex Michaelides (LSE) • **Carl Emmerson** (IFS) • **David McCarthy** (Imperial)
Guglielmo Weber (Padua) • **Orazio Attanasio** (IFS) • **Richard Disney** (Nottingham)

More information and registration details will be published soon in the FMG website

<http://fmg.lse.ac.uk>



The Future of Banking Regulation

7 and 8 April 2005

Hong Kong Theatre

The London School of Economics and Political Science

The Basel II Capital Accord represents the most important development in international banking regulation since the original 1988 Accord. Not only is greater risk-sensitivity to be introduced to the minimum capital requirements but also new measures aimed at enhancing supervisory review and market discipline are to be adopted. The industry, economic and policy implications of these reforms frame the debate on *The Future of Banking Regulation* – the topic of a conference to be held by the Financial Markets Group on April 7 and 8 2005.

This unique conference, supported by the Financial Services Authority and the World Bank, will feature contributions from leading academics and practitioners. The keynote speaker is to be Jaime Caruana, Chairman of the Basel Committee on Banking Supervision and Governor of the Bank of Spain.

Building up from a review of the details of the Basel II proposals and the related implementation process the sessions will provide a forum for discussion of the following crucial issues.

- What are the potential economic consequences of Basel II, for banks and the macro-economy?
- How will the reforms impact upon emerging markets?
- How have political economy considerations influenced the proposals and their adoptions?
- The conference will conclude with a broad-ranging panel discussion.

The conference is by invitation only. The full programme and more details will be announced in early February on the FMG website at <http://fmg.lse.ac.uk>. If you require further information please contact the FMG administration on 020 7955 6301 / 020 7955 7891 or email: fmg@lse.ac.uk

The conference is supported by the Financial Services Authority and the World Bank.

Second RICAPE Conference

'RICAFE Risk Capital and the Financing of European Innovative Firms'

15-16 October 2004

The second RICAPE conference was held on 15 and 16 October 2004 in Frankfurt and was hosted by the Center for Financial Studies, which is one of the programme's research partner institutions. The conference attracted top researchers in the venture capital area from both Europe and the US. The papers presented were a blend of both theoretical and empirical work and

represented the latest thinking on the subject. Both academics as well as practitioners participated in the conference.

Professors David Webb, Antoine Faure-Grimaud and Sridhar Arcot from the FMG participated in the conference. Webb chaired a session and also led an interesting panel discussion on 'Financing

entrepreneurial companies: what role is there for public policy?' Faure-Grimaud discussed the paper 'The Choice between Sources of Financing and Rate of Return Inequality' presented by Orna Serban Levy (joint with Elazar Berkovitch). Finally, Sridhar Arcot presented his paper 'Participating Convertible Preferred Stock in Venture Capital Exits' in the conference.

New RICAPE Working Paper Series

The second batch of RICAPE working papers have been released and can now be downloaded from www.lse.ac.uk/collections/RICAPE/docfind.htm

The list of papers released is as follows:

RICAPE WP 006

An Analysis of Shareholder Agreements

Gilles Chemla, Michel Habib and Alexander Ljungqvist

RICAPE WP 007

Advice and Monitoring: Venture Financing with Multiple Tasks

Ibolya Schindele

RICAPE WP 008

Contractual Relations between European-VC Funds and Investors: The Impact of Reputation and Bargaining Power on Contractual Design

Daniel Schmidt and Mark Wahrenburg

RICAPE WP 009

Private Equity Returns and Disclosure Around the World

Douglas Cumming and Uwe Walz

RICAPE WP 010

Legality and Venture Governance Around the World

Douglas Cumming, Daniel Schmidt and Uwe Walz

RICAPE WP 010

Legality and Venture Governance Around the World

Douglas Cumming, Daniel Schmidt and Uwe Walz

RICAPE WP 011

Quid Pro Quo In IPOs: Why Book-Building is Dominating Auctions?

François Degeorge, François Derrien and Kent L Womack

RICAPE WP 012

Active Financial Intermediation: Evidence of the Role of Organizational Specialization and Human Capital

Laura Bottazzi, Marco Da Rin and Thomas Hellmann

Capital Markets Workshop

The Capital Markets Workshop meets regularly throughout the academic year at 5pm on Wednesdays in room R405, Lionel Robbins Building, LSE. Please see the schedule below for any different times/locations.

Lent Term 2005

12 January	Alan Morrison (Oxford Said) <i>The Demise of Investment Banking Partnerships; Theory and Evidence</i>
19 January	TBC
26 January	Anna Pavlova (Sloan School of Management) <i>Flight to Quality, Contagion and Portfolio Constraints</i>
2 February	Simone Managenelli (ECB) <i>The Contagion Box: Measuring Financial Market Co-movements by Regression Quantities</i>
9 February	TBC
16 February	Per Stromberg (The University of Chicago Graduate School of Business) TBC
23 February	Ailsa Roell (Princeton University) <i>Executive Pay, Earnings Manipulation and Shareholder Litigation</i>
2 March	Matt Richardson (Stern, NYU) TBC
9 March	Jennifer Conrad (University of North Carolina) <i>Basis Assets</i>
16 March	Harrison Hong (Princeton University) TBC

Organised by: Antoine Faure Grimaud

Revisions to the programme may take place, these will be identified through the website at:
<http://fmg.lse.ac.uk>

The Capital Markets Workshop is funded by:
The Department of Accounting and Finance, LSE
The Suntory and Toyota International Centres for Economics and Related Disciplines, LSE

ESRC funded research project, completed

'The Impact of Macro Fundamentals Market Microstructure and Intervention on Exchange Rates'

Due to the remarkable failure of standard macroeconomic models to explain foreign exchange rates, emphasis has moved towards high frequency/microstructure explanations. This switch in paradigm can, arguably, be dated back to Goodhart (1988) and since then the FMG has been at the forefront of high frequency FX research. This has recently been evidenced by a three year ESRC funded project that was completed in October 2003. The aims of the research were, among others, to further understand the determinants of high frequency FX returns, to clarify the links between liquidity, transactions activity and volatility, and to examine the efficacy of Central Bank intervention.

The FMG has recently (October 2004) received the ESRC's evaluation, where our research project was awarded a grade of **'outstanding'**. Their report stated that the... *'project has fully met its objectives and has provided an exceptional research contribution'*, and that the project was... *'a well-planned, well-executed research endeavor that attacked topics of great importance'*. The FMG was also congratulated on the collection and organisation of data, and on the dissemination of its results, including the hosting of a major conference in April 2003. This brought together leading researchers from around the world to discuss recent developments in FX microstructure as well as empirical finance. (See FMG Review 58 for a detailed summary of this conference.)

Under the leadership of Jon Danielsson, Charles Goodhart and Richard Payne, the research team at FMG made use of a number of datasets, including one of up to ten months of tick-by-tick data from the Reuters D2000-2 trading platform, that covered four heavily traded floating exchange rates. Using

these data, we were able to address issues such as the aggregation of order flow models (essentially providing a link between ultra high frequency models of exchange rate determination and lower frequency models that are of more interest to macroeconomists), the assimilation of public information into FX rates, and cross-market spillovers. For example Danielsson, Luo and Payne (2002) analyses the direct and cross effects of order flow on exchange rates. Not only do they find that order flow in one market has a significant impact on the exchange rate in that market, they also find significant cross market effects. In particular, sterling exchange rates are determined, at least in part, by USD/EUR order flow, implying that the aggregation of information from the trading process can occur both within and across markets.

Using ten years of US dollar-Swiss franc indicative quotes, we were also able to test how effective Central Bank intervention can be. Previous research had found mixed results for such operations, partly because they had focussed on data sampled at the daily frequency, where the effects of intervention may have been swamped by normal market activity. By analysing interventions using tick data, Payne and Vitale (2003) were able to find significant effects of these trades, especially when the Swiss National Bank moved 'with the market' or acted in coordination with other Central Banks.

The success of the project is shown by numerous working papers (available in the FMG discussion paper series), journal articles and books, as well as dissemination of the results at a number of conferences and seminars. Much of this FX research is still ongoing and promises to produce further insights into the workings of these markets.

FMG Job Market Candidates

In this current academic year the following students have completed their PhD Thesis and are in the job market.



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Beatriz Mariano
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Paolo Colla
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Miguel Segoviano
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Ryan Love
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Contact details and research interests can be found in the FMG website at <http://fmg.lse.ac.uk>

Discussion papers

DP 482

A Model to Analyse Financial Fragility: Applications

Charles Goodhart, Dimitrios Tsomocos and Pojanart Sunirand

The purpose of this work is to explore contagious financial crises. To this end, the authors use simplified, thus numerically solvable, versions of their general model; Goodhart, Sunirand and Tsomocos (2003). The model incorporates heterogeneous agents, banks and endogenous default, thus allowing various feedback and contagion channels to operate in equilibrium.

Such a model is found to lead to different results from those obtained when using a standard representative agent model. For example, there may be a trade-off between efficiency and financial stability, not only for regulatory policies, but also for monetary policy. Moreover, agents which have more investment opportunities can deal with negative shocks more effectively by transferring 'negative externalities' onto others.

DP 483 (IAM Series No 003)

Simple Tests for Models of Dependence Between Multiple Financial Time Series, with Applications to US Equity Returns and Exchange Rates

Yanqin Fan, Xiaohong Chen and Andrew Patton

Evidence that asset returns are more highly correlated during volatile markets and during market downturns (see Longin and Solnik, 2001, and Ang and Chen, 2002) has led some researchers to propose alternative models of dependence. In this paper the authors develop two simple goodness-of-fit tests for such models. They use these tests to determine whether the multivariate Normal or the Student's *t* copula models are compatible with US equity return and exchange rate data. Both tests are robust to specifications of marginal distributions, and are based on the multivariate probability integral transform and kernel density estimation. The first test is consistent but requires the estimation of a multivariate density function and is recommended for testing the dependence structure between a small number of assets. The second test may not be consistent against all alternatives but it requires kernel estimation of only a univariate density function, and hence is useful for testing the dependence structure between a large number of assets. The authors justify the tests for both observable multivariate strictly stationary time series and for standardized innovations of GARCH



models. A simulation study demonstrates the efficiency of both tests. When applied to equity return data and exchange rate return data, the authors find strong evidence against the normal copula, but little evidence against the more flexible Student's *t* copula.

DP 484

Financial Institutions and The Wealth of Nations: Tales of Development

Chenggang Xu and Jian Tong

Interactions between economic development and financial development are studied in this paper by looking at the roles of financial institutions in selecting R&D projects (including for both imitation and innovation). The effectiveness of R&D selection mechanisms depends on the institutions and the development stages of an economy. At higher development stages a financing regime with ex post selection capacity is more effective for innovation. However, this regime requires more decentralized decision-making, which in turn depends on contract enforcement. A financing regime with more centralized decision-making is less affected by contract enforcement but has no ex post selection capacity. Depending on the legal institutions, economies choose regimes that lead to different steady-state development levels. The financing regime of an economy also affects development dynamics through a 'convergence effect' and a 'growth inertia effect.' A backward economy with a financing regime with centralized decision-making may catch up rapidly

when the convergence effect and the growth inertia effects are in the same direction. However, this regime leads to large development cycles at later development stages.

DP 485 (UBS Pensions series 21)

Stopping short? Evidence on contributions to long-term savings from aggregate and micro data

Sarah Smith

With a move away from up-front charges following the introduction of stakeholder pensions, consumers are no longer penalised for lapsing on many long-term savings policies. Nevertheless, persistency rates may still provide an (imperfect) indicator of sales quality and provide some information on how consumers are building up savings for the longer-term. Furthermore, persistency is an increasingly important issue for financial providers and the profitability of stakeholder-friendly products. This paper uses aggregate persistency data and survey data from the British Household Panel Survey to address three key questions: What drives persistency rates among different groups in the population? To what extent does non-persistency appear to reflect poor sales and advice, rather than events in consumers' lives that were not predictable at the time of sale? and are there any messages that could be given to the industry or to consumers to help raise levels of persistency?

DP 486 (UBS Pensions series 22)

Performance of Personal Pension Schemes in the UK

Alan Gregory and Ian Tonks

This paper examines the performance of personal pensions (exempt unit trusts) in the UK from 1980-

2000. Unitised personal pension schemes are a type of mutual fund that is constituted as a contractual savings scheme, whose value can only be accessed at retirement. By studying the performance of these schemes the authors are able to assess the role of illiquidity in retail savings products. The paper examines those personal pension schemes that invest predominantly in UK equities, and first reports on the growth in personal pension schemes over this twenty-year period. The paper then assesses the performance of these pension funds relative to various asset pricing benchmarks, including a four factor benchmark that allows for momentum in stock returns. When allowing for market timing and conditioning on macroeconomic variables, the paper finds that average performance is not significantly different from zero. The authors then go on to examine persistence in performance of these pension schemes and identify negative persistence at short horizons. However, at time-intervals of six months to one year, significant positive persistence is found, although this positive persistence weakens at longer time intervals.

DP 487 (UBS Pensions series 23)

Sponsoring Company Finance and Investment and Defined Benefit Pension Scheme Deficits

David C Webb

This paper presents a model of the interaction of a company's financial and real investment decisions with the financing of its defined benefit pension plan. The pension plan deficit is a debt of the company, with explicit funding requirements and priority in the event of company insolvency. Pension plan deficits and options on future deficits and surpluses affect investment incentives as does the size and composition of company debt. The author illustrates the incentives for the firm to pay dividends rather than fund the pension plan

and also presents the general incentives to overfund the plan. The paper also illustrates the impact of pension benefit insurance and minimum funding requirements.

DP 488

A Theory of Sovereign Debt Roll-over Crisis

Masazumi Hattori

This paper provides a theoretical investigation of debt roll-over crises in government bond markets. Using global game techniques, the author analyses coordination problems in debt auctions. The approach allows one to gain insight on the relation between the occurrence of sovereign debt roll-over crises and the fundamentals of the economy, which is not clearly explained in existing work. This paper also makes it clear how the amount of debt for refinancing affects the occurrence of sovereign debt roll-over crises. Implications to policymakers are that they should pay attention to possible serious consequence of debt-bunching which usually grows gradually over time. In public debt management, the government decisions today affect the situation facing the government in the future via change in redemption schedules. Although the cost of a debt roll-over crisis is not easy to gauge beforehand, its possibility should be noted by policymakers.

DP 489

General Properties of Rational Stock-Market Fluctuations

Antonio Mele

This paper asks, 'Which pricing kernel restrictions are needed to make low dimensional Markov models consistent with given sets of predictions on aggregate stock-market fluctuations?' The author develops

theoretical test conditions addressing this and related reverse engineering issues arising within a fairly general class of long-lived asset pricing models. These conditions solely affect the first primitives of the economy (probabilistic descriptions of the world, information structures, and preferences). They therefore remove some of the arbitrariness related to the specification of theoretical models involving unobserved variables, state-dependent preferences, and incomplete markets.

DP 490

Multiple-bank lending: diversification and free-riding in monitoring

Sonja Daltung, Vittoria Cerasi and Elena Carletti

This paper analyzes the bank's choice between lending to firms individually or sharing this lending with other banks, when firms and banks are subject to moral hazard and when monitoring is essential. Multiple-bank lending is optimal whenever the benefit of greater diversification in terms of higher monitoring dominates the costs of free-riding and duplication of efforts. The model predicts a greater use of multiple-bank lending when banks are small relative to investment projects, and when firms are less profitable. The authors also find that poor financial integration, regulation and inefficient judicial systems increase monitoring costs. These results are consistent with empirical observations concerning small business lending and loan syndication.

Special papers

SP 154

A speech by Sir Andrew Large 'Financial Stability Oversight, Past and Present'

Sir Andrew Large

This special paper is a transcript of a lecture given by Sir Andrew Large, on 22 January 2004. The last 30 years has seen a huge transformation of the financial system. There are, for example, interconnections between firms and across national borders, and the challenges faced by those overseeing financial stability have therefore also grown. This paper discusses the importance of financial stability and analyses the implications of the changing global environment. The paper also describes the roles played by the Bank of England, the Financial Services Authority and the Treasury, when examining financial stability oversight in the UK.

SP 155

A speech by Sir Howard Davies 'Creating a Single Financial Market in Europe: What Do We Mean?'

Sir Howard Davies

This special paper is a transcript of a lecture given by Sir Howard Davies, on 3 February 2004. European heads of government had committed themselves at the Lisbon Summit in March 2000 to the objective of making the European Union the most competitive economy in the world by 2010, and one aspect of that was the need to bring about a unified, liberalised and efficient European financial market. The paper discusses the aim of creating a single financial market in

Europe and outlines a number of obstacles that may hinder the realisation of such a goal. The paper also presents a number of tests that can be used to judge how successful this integration has been.

SP 156

Financial Supervision in an Integrating Europe: Measuring Cross-Border Externalities

Sander Osterloo and Dirk Schoenmaker

Against the backdrop of an integrated Europe, the debate on the need for European arrangements for financial supervision and stability is intensifying. While there is a consensus that the need for European arrangements ultimately depends on the intensity of cross-border spill-over effects within the EU, there has been no attempt to measure these cross-border externalities. The aim of this paper is to fill this gap. A new data-set on cross-border penetration (as a proxy for cross-border externalities) of large banking groups is collected. It is found that cross-border penetration within the EU is currently limited: only seven banks out of the sample of 30 large EU banking groups are considered to be 'European' banks that have the potential to pose significant cross-border externalities. However, aggregate data show a gradual, though statistically significant, increase of cross-border penetration in the EU. Policy-makers may thus in the (near) future face the challenge of designing European structures for financial supervision and stability.

Forthcoming Discussion and Special Papers

Discussion Papers

DP 491(UBS Pensions series 24)

'A Human Capital Explanation for an Asset Allocation Puzzle'

Alex Michaelides and Francisco Gomes

DP 492

'A Model to Analyse Financial Fragility'

Charles Goodhart, Dimitrios Tsomocos and Pojanart Sunirand

DP 493

'Real Effects of Regional House Prices: Dynamic Panel Estimation with Heterogeneity'

Sonia Munoz

DP494

'Career Concerns in Financial Markets'

Amil Dasgupta and Andrea Prat

DP495

'The Monetary Policy Committee's Reaction Function: An Exercise in Estimation'

Charles Goodhart

DP 496

'The Interaction between the Bank of England's Forecasts and Policy, and the Outturn'

Charles Goodhart

DP 497

'Spanning Tests in Return and Stochastic Discount Factor Mean-Variance Frontiers: A Unifying Approach'

Francisco Penaranda and Enrique Sentana

DP 498 (UBS Pensions series 25)

'The Wrong Kind of Transparency'

Andrea Prat

DP 499

'Estimation of Partial Differential Equations with Applications in Finance'

Dennis Kristensen

DP 500

'Estimation in Two Classes of Semiparametric Diffusion Models'

Dennis Kristensen

DP 501

'A Semiparametric Single-Factor Model of the Term Structure'

Dennis Kristensen

DP 502

'Estimation and Testing of Dynamic Models with Generalised Hyperbolic Innovations'

Enrique Sentana

DP 503

'Eurobond Underwriter Spreads'

Michael Kollo, Neil Esho and Ian Sharpe

DP 504

'A Risk Assessment Model for Banks'

Charles Goodhart, Dimitrios Tsomocos and Pojanart Sunirand

DP 505 (UBS Pensions series 26)

'Defined Benefit or Defined Contribution? An Empirical Study of Pension Choices'

Joao F Cocco and Paula Lopes



Forthcoming Discussion and Special Papers

DP 506

'Opening and Closing the Market: Evidence from the London Stock Exchange'

Hyun Song Shin, Ian Tonks and Andrew Ellul

DP 507 (UBS Pensions series 27)

'Liability Valuation and Optimal Asset Allocation'

Joachim Inkmann and David Blake

DP 508

'Consistent Testing for Stochastic Dominance: A Subsampling Approach'

Yoon-Jae Whang, Esfandiar Maasoumi, Robert
A Korajczyk and Oliver Linton

DP 509

'A Live Method for Generalized Additive Volatility Models'

Thong Nguyen, Woocheol Kim and Oliver Linton

DP 510

'Feedback Trading'

Jon Danielsson and Ryan Love

DP 511

'Estimating Semiparametric ARCH Models by Kernel Smoothing Methods'

Enno Mammen and Oliver Linton

DP 512

'Estimation of Linear Regression Models by a Spread-Tolerant Estimator'

Oliver Linton

DP 513

'Flexible Term Structure Estimation: Which Method is Preferable?'

Thong Nguyen, Andrew Jeffrey and Oliver Linton

DP 514

'The Shape of the Risk Premium: Evidence from a Semiparametric GARCH Model'

Benoit Perron and Oliver Linton

DP 515

'Yield Curve Estimation by Kernel Smoothing'

C Taanggard, J Nielsen, Enno Mammen and
Oliver Linton

Special Papers

SP157

'Gradualism in the Adjustment of Official Interest Rates: Some Partial Explanations'

Charles Goodhart

SP158

'Per Jacobsson Lecture: Some New Directions for Financial Stability?'

Charles Goodhart

Visitors to the FMG

November 2004-January 2005

Alan Morrison (Oxford Said)
Alessandro Vercelli (University of Siena)
Alexander Muermann (The Wharton School, University of Pennsylvania)
Andrew Powell (Universidad Torcuato di Tella)
Arvind Krishnamurthy (NWU)
Christian Laux (University of Frankfurt)
Denis Gromb (London Business School)
Enrique Sentana (CEMFI)
Francisco Penderanda (University of Alicante)
Gilles Chemla (Sauder School of Business)
Guillaume Plantin (Carnegie Mellon Business School)
Heski Bar-Isaac (NYU)
Joao Gomes (The Wharton School, University of Pennsylvania)
Marco Pagano (Università di Napoli Federico II and CSEF)
Marcus Brunnermeier (Princeton University)
Raoul Minetti (Michigan State University)
Robert Kosowski (INSEAD)
Satoshi Kawanishi (Sophia University)
Serdar Dinc (University of Michigan Business School)
Sergei Guriev (New Economic School, Moscow)
Silvia Marchesi (University of Siena)
Tarun Ramadorai (University of Oxford)
Tom Lawton (RSM Robson Rhodes Ltd)
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