

AXA-FMG CONFERENCE FINANCIAL INTERMEDIATION, BANKING AND MACRO-STABILITY

2-3 December 2010

The Financial Markets Group and AXA Research Fund hosted a two-day conference at LSE on financial intermediation, banking and macro-stability.

David Webb (FMG, LSE) introduced the conference. He focussed on economic thought in the wake of the Great Depression and, quoting Irving Fisher and Henry Simons, emphasised that their entreaties to synthesise macroeconomic and banking theories were largely ignored in the twentieth century. He suggested that it took the financial crisis of 2008 for economists to begin incorporating banking into macroeconomics again.

The first presentation on 'Financial crises, bank risk exposure and government financial policy' was given by **Nobu Kiyotaki** (Princeton University) who along with Mark Gertler and Albert Queralto (both from New York University) has built financial intermediation into a dynamic macroeconomic framework in order to analyse central bank policy after the 2008 financial crisis. Kiyotaki is a leader in modelling macroeconomic credit and he pointed out that his work on this topic to date, namely the noted 1989 paper by Ben Bernanke and Mark Gertler as well as his own work with John Moore in 1997, omits banks' choice of short-term debt instruments while holding it culpable for stirring up trouble. The current project addresses this by modelling the intermediaries' choices of lending practices explicitly.



Rafael Repullo (CEMFI, Madrid), **Douglas Gale** (NYU), **Dimitrios Tsomocos** (Said Business School, University of Oxford), **David Webb** (FMG, LSE), **Ernst-Ludwig von Thadden** (University of Mannheim), and **Javier Suarez** (CEMFI, Madrid)

Opening with slides depicting the changes in asset composition of the Fed's balance sheet over the course of the crisis, Kiyotaki immediately drew attention to the importance of governmental policy in banks' capital structure decisions. Given the established understanding that intermediaries' short-maturity capital structure makes them overly vulnerable to interest rate risk and other macroeconomic shocks, Kiyotaki, Gertler and Queralto asked why banks' capital structure is the way it is. They concluded that the anticipation of being bailed out exacerbates banks' motives to

continues on page 2



FINANCIAL INTERMEDIATION, BANKING AND MACRO-STABILITY

continued from page 1



Sudipto Bhattacharya (FMG, LSE)

issue short-term securities. Having motivated the pertinence and importance of governmental policy 'to offset the effects of anticipated credit policy', the authors went about what Kiyotaki termed 'not really econometrics, more of a quantitative exercise' by estimating their model's parameters to uncover optimal policy in numerical terms.

Douglas Gale (New York University), in a new paper with Tanju Yorulmazer (Federal Reserve Bank of New York), investigated the concept of interbank market 'freezes' within a setting neatly built up from the same banking classic as his 1987 paper with Sudipto Bhattacharya (FMG, LSE). This time he presented his work on 'Liquidity hoarding' and used the set-up to study the interbank market exclusively. He cleverly stretched the model temporally so as to allow banks to have incentives to hold cash (hoard liquidity) both to protect themselves in case they should unexpectedly need money in the future (what he called the precautionary motive for hoarding) and to seek profits should liquid assets suddenly become very expensive due to others' liquidity demands (what he called the speculative motive for hoarding). He suggested that the two motives may coexist and that the firm hence faced uncertainty in the decision as to whether to supply liquidity. He remarked, 'If we had anticipated the crisis with probability we would not have had the crisis'.

Gale is still working on the paper, analysing possible interventions to improve on what he calls the laissez-faire allocation – the allocation that results from banks making their own decisions about liquidity accumulation and provision – in comparison to the allocation that a benevolent central planner would advocate. Gale's research aims to provide a new base for understanding liquidity.

Javier Suarez (CEMFI, Madrid) presented his joint work with Anatoli Segura-Velez (also CEMFI, Madrid) on 'Liquidity shocks, roll-over risk and debt maturity' which focussed on an infinite horizon banking model that he said was intended to align the current banking literature with macroeconomic methodology. Following the Great Recession the two fields now shared common goals and foci and should therefore communicate in the same language.

In the context of that broad motivation, the paper's specific goal was to analyse the relationship between the maturity mismatch of a bank's assets and its liabilities and the rollover risk that results from its financing of long-term projects with short-term deposits. The main exercise the authors undertook was to uncover a bank's optimal maturity structure of debt if it issues non-tradable securities onto a competitive market. They found that the resulting debt was inefficiently short-term because the desire to appeal to investors, who may randomly demand additional liquidity, outweighed the potential expense of having to borrow from rent-seeking lenders in the event of a crisis (rollover risk). This inclination of financial institutions to favour excessive liquidity suggests a role for a social planner. In addition to risk-based capital requirements, regulators might impose that intermediaries hold additional long-term assets.

Todd Keister (Federal Reserve Bank of New York) presented 'Bailouts and financial fragility' in which he analysed the trade-off of pulling a financial sector out of crisis to restore the overall economy with the potentially distortionary effect that banks' knowledge of this policy has in normal times. Keister set his model in the classic two-date single-bank world of Diamond and Dybvig's 1983 framework. His paper is the microeconomic counterpart to the macroeconomic work that Kiyotaki presented in the morning. However, contrary to the Kiyotaki, Gertler and Queralto paper in which banks hold an excessive proportion of short-term assets and overexpose themselves to interest rate risk, the problem in Keister's model arose from banks holding too many long-term (illiquid) assets and becoming insolvent in the event of a crisis.

By introducing a public sector supported by investor taxes, Keister modelled the role of the government in good times as well as when depositors run on

the bank, in which case the government can use its revenues to save the financial sector. While this bailout is clearly ex-post efficient, he asked whether the state's ability to commit to not rescue the bank is ex-ante welfare improving, as it removes the incentive to invest excessively in illiquid assets. He found that commitment to no-bailout can over-correct the problem and reduce efficiency since the intermediary over-invests in liquid assets and as such, under-provides maturity transformation services. In his words, 'Bailouts encourage risk taking, and people don't realise that sometimes this is a good thing.' The paper concluded with the suggestion that the government mitigate the problem via the creative policy of replacing the tax on investors with a Pigouvian tax on the intermediary itself.

The second day of the conference began with **Rafael Repullo's** (CEMFI, Madrid) paper 'Moral hazard and debt maturity' (co-authored with Gur Huberman, Columbia Business School). Repullo presented a model explaining the maturity of a bank's uninsured debt. In this paper he addressed the question of why banks use short-term debt in the first place and the implication of this for regulation. In the model, he argued that if after raising funds from investors, banks can privately choose a risk level for their investment, they will be excessively risky (risk-shifting) as they are the residual claimant of the asset's payoff. Short-term debt hence can have a disciplining function to mitigate this moral hazard problem since it has to be refinanced during the interim period when more information about the asset's riskiness is revealed. The use of short-term debt, however, introduced the possibility of early, inefficient liquidation. Taking the cost and benefit of short-term debt into account, Repullo compared long-term and short-term debt and showed that, i) when the profitability of the investment is relatively low, only short-term debt is feasible; and ii) when the quality of interim information and the early liquidation value of the asset is high enough, short-term debt financing is optimal. He concluded that regulators should be cautious about restricting banks' ability to use short-term debt.

Ernst-Ludwig von Thadden (University of Mannheim) presented 'Repo runs' (co-authored with Antoine Martin and David Skeie, both from the Federal Reserve Bank of New York) which aimed to provide a theory of fragility of wholesale

financing and studied the stability of different market microstructures. Von Thadden identified that the key difference between traditional banks and modern financial intermediaries ('dealers' in this paper) is that the latter's assets are much more liquid and marketable and therefore can be mobilised to forestall runs. The paper showed first that without asset sales, runs can be prevented either by dealers' profits or high enough collateral value of assets; second, if the dealers can sell their assets, the price of the assets will determine the survival of dealers while the price depends on the quantity supplied by troubled dealers and the demand from the healthy dealers (cash-in-the-market pricing). Finally, von Thadden applied the model in a different market microstructure and provided an explanation for why haircuts to bilateral repo markets had jumped during the crisis whereas tri-party repo haircuts hardly increased.

The conference continued with the paper 'Default, liquidity and the yield curve' presented by **Raphael Espinoza** (International Monetary Fund). The paper was jointly written with Dimitrios Tsomocos (Saïd Business School, University of Oxford) and Charles Goodhart (FMG, LSE). The aim of the paper was to understand how illiquidity in asset/commodity markets and default risk affect the demand for money and the role of monetary policy. In addition, the authors wanted to find the implications of liquidity and default risk for activity, asset prices and the yield curve. They used a monetary model with endogenous default risk, heterogeneous agents and uninsurable illiquidity and default risk, and concluded that illiquidity in asset and commodity markets increased the demand for money. They also found that changes in default penalties (regulation) shifted money demand and affected the elasticity of money demand to interest rates; asset prices were a function of money supply, asset liquidity and trade efficiencies; and liquidity risk in endowments and assets mattered for the slope of the yield curve.

In the final session of the conference, **Sudipto Bhattacharya** (FMG, LSE) presented his joint work with Georgy Chabakauri (also FMG, LSE) and Kjell Nyborg (ISB, University of Zurich) on 'Aggregate risk perceptions, adverse selection and securitized lending: mitigating the allocational consequences of exuberance'. The authors developed a model of securitised lending in which both publicly observed aggregate shocks to values of securitised

loan portfolios, and later asymmetrically observed understanding of the differences in their qualities in the cross-section of their subsets, play a key role. The authors found that the originators and potential buyers of such assets differ in their risk attitudes and temporal dynamics of their trades, which results in the overall reduction in aggregate surplus accruing from securitisation. Moreover, the temporal heterogeneity in agents' trades, arising from their respective differences in ex-ante exuberance, may lead to financial crises, through coordinated asset liquidation inconsistent with any market equilibrium.

Bhattacharya, Chabakauri and Nyborg developed and analysed a model in which securitised lending, with both publicly observable shocks to securitised loan values and asymmetric information about the qualities of their subsets played an essential role in the investment process. The authors assumed that the valuation wedge that arises between short-run (SR) and long-run agents (LR), (after an adverse aggregate shock), applied to all asset subsets, irrespective of their respective differences in quality, as understood by the SR agents. The authors found that LR agents are always worse-off in any delayed trading equilibrium, relative to an early trading equilibrium, keeping everything else fixed.

Furthermore, Bhattacharya considered a scenario in which a subset of optimistic (exuberant) agents, made their trading and investments choices based on a delayed trading equilibrium, whereas the remainder of SRs and LRs, who are less optimistic, make their choices immediately, before the aggregate shock has arisen. This scenario sketched a plausible process for a 'financial crisis'. The authors then showed that the changes in the beliefs of the less optimistic LR agents, and its immediate impact on trading prices, may lead to (repo) runs by the short-term creditors of optimistic SR agents, even before the adverse aggregate shock has taken place. The SR agents, who had planned to trade in the delayed equilibrium, then start selling the assets, leading to a market breakdown or malfunction, prior to the stage when the asymmetric information about quality of asset subsets accrues to SR agents. The market then collapses and stays that way.

Conference organised by: **David Webb** (FMG, LSE)

AXA-BANK OF ENGLAND-HEIF4-FMG CONFERENCE MACROPRUDENTIAL POLICY: ISSUES AND CHALLENGES

2 November 2010

This one day conference focussed on macroprudential policy and its issues and challenges. **Charles Goodhart** (FMG, LSE) started the discussion by suggesting that by adding a 'macroprudential' dimension, ie, by taking into account the system-wide externalities that the actions of individual financial institutions create, academics and policy makers can better promote financial stability.

He then outlined the topics explored in the conference:

- 1 Whether existing regulatory models can bear the weight that macroprudential policy places upon them;
- 2 What the crisis revealed about the performance of regulatory institutions in the US and what general lessons and ideas for improving regulatory institutions can be drawn from that experience;
- 3 The extent to which the theoretical work on systemic risk properly takes into account the manner that financial institutions actually deal with liquidity shocks; and
- 4 The case for macroprudential policy in an imperfect world.

Jean Helwege (University of South Carolina) presented 'Crises, liquidity shocks, and fire sales at financial institutions', co-authored with Nicole Boyson (Northeastern University) and Jan Jindra (Menlo College). In their work, the authors investigated the role of liquidity shocks in financial crises by examining funding sources and asset sales at commercial banks, investment banks and hedge funds. Theory predicts that as liquidity dries up in the capital markets, financial institutions that use short-term funding will be forced to sell assets at fire sale prices. Helwege and her co-authors found that the majority of commercial banks and investment banks do not



Charles Goodhart (FMG, LSE) and **Jerry Caprio** (Williams College)

experience declines in funding during crises. Their results also suggested that these firms do not sell many assets into a falling market as they rely on other methods to avoid fire sales. Similarly, the authors found no support for the idea that funding-constrained hedge funds are forced into fire sales that amplify liquidity shocks. In particular, firms often sell more of their stock holdings than would be required to meet redemption requests and use some of the proceeds to make additional purchases.

In his discussion of the paper, **Lewis Webber** (Bank of England) identified several crisis periods, and examined whether what was described in the paper fit well with the experience of institutions including commercial banks, investment banks and hedge funds.

Jerry Caprio (Williams College) outlined his forthcoming book 'The guardians of finance: making them work for us'. He started his

presentation by setting out some common narratives of the subprime crisis. He argued that the crisis was caused by a collection of factors, but one unarguably important factor was financial deregulation in the US. At a time when the US had large capital inflows and easy money, financial institutions had the opportunity to exploit regulatory loopholes. A common criticism is that relevant regulatory bodies did not enforce the rules. Moreover, governance failed as dispersed shareholders had poor incentives, and risk models were flawed. Return was rewarded without accounting for the relevant risk and the compensation gap between the financial sector and the rest of the economy which was at its peak just before the crisis.

Caprio then highlighted the importance of regulatory frameworks by examining several other recent crises around the world. He listed countries such as Ireland, whose asset bubble was a result of an old fashioned lending boom; the UK, whose main financial regulator FSA failed to oversee Northern Rock; and Iceland, where currency mismatch, insider lending and fraud all contributed to its default. Hence he suggested several reform priorities, which included the recognition of regulatory inaction and the need for a Sentinel Agency. Specifically, he emphasised the need for a watchdog agency which focuses on assessing systemic risk and reports regularly. He then pointed out that enhanced transparency would improve governance as well.

Finally, Caprio highlighted other lessons which could be learnt from the crisis, for example, required disclosure is needed despite it potentially reducing the size of securitisation; more open provision of information is needed in grading institutions to promote better credit evaluation;



and last but not least, macroprudential policy should be included in the general framework of financial regulation.

The morning half of the conference closed with a discussion by **Andrew Bailey** (Bank of England), entitled, 'Financial regulation in a changing world: lessons from the recent crisis'. He began by asking what sort of regulatory reform is needed at present, and proposed that a dynamic and more forward looking regulatory framework with more transparency and accountability is probably best to promote financial stability today. He responded to Caprio's talk by showing evidence of the substantial rise in the rate of increase in US homeownership before the crisis. He also emphasised the role of macroprudential policy in promoting financial stability and stressed the need to balance competing public policy objectives, noting the difference in transmission mechanisms between macroprudential policies and monetary policies.

Jon Danielsson (FMG, LSE) discussed the characteristics of systemic risk models used in the banking industry. He first distinguished endogenous risk (risks from shocks that are generated and amplified within the banking system), from exogenous risk (risks that arrive from outside the system). Accurate risk modelling for the simple case of a single institution's exogenous risk is beyond our current abilities, let alone systemic endogenous risk which is even more complex. Active protection of the banking system, in the form of the Basel accords, is made more difficult since risk measurement is mostly inaccurate. In addition, Basel assumes that the shocks in the banking sector are independent but in reality the shocks have complicated dependence patterns. He also noted that banks try to take on risk in areas not focussed on by regulators and therefore it is useless to use data from the last financial crisis to predict the next one. He advocated that regulatory actions should not be risk model dependent and not easily manipulated. Bank regulators should be given a mandate to identify systemic risk instead of measuring it.



Jean Helwege (University of South Carolina), **Lewis Webber** (Bank of England) and **Céline Gondat-Larralde** (Bank of England)

His discussant, **Kostas Tsatsaronis** (BIS), agreed with most points made by Danielsson. He felt that a pragmatic approach is needed to deal with systemic risk, since risk measurement technology is not yet capable of coping with the complexities of financial system behaviour. In addition to Danielsson's suggestions, Tsatsaronis added two more ideas to deal with systemic risk: 1) the use of rules of thumb like growth rates of credit and asset prices in detecting forthcoming bubbles; and 2) changing the mindsets of the private sector in dealing with systemic risk.

Charles Goodhart (FMG, LSE) presented 'The case for macroprudential policy' and stressed the need to prevent banking regulation exacerbating boom and bust cycles. Counter-cyclical macroprudential regulation is too difficult to implement and will rarely be used, as in the case of Pillar 2 of Basel II. He preferred a 'comply or explain' policy, raising the general level of bank equity ratios, and having some direct constraints imposed, for example, on dividend pay-outs. These changes may lead to shifts of business outside the banking sector. He concluded that regulation will not, and cannot, prevent crises, but may mitigate their virulence.

Finally, **Alex Barnett** (Standard Chartered) described the experiences of some Asian economies in dealing with economic bubbles in his presentation on 'Macroprudential policy in practice'. Thailand, Singapore and Hong Kong all suffered a boom and bust in the property market in the 1990s. Singapore and Hong Kong in particular implemented macroprudential policies to curb the property market, for example, cutting loan-to-value ratios and capping mortgages. These policies are also currently being implemented as their property markets are overheating. He also identified China as the next economy to experience strong economic growth and potential overheating. Barnett concluded that the lesson to be learned from the Asian economies is that executing macroprudential policies is difficult and therefore regulators need to use tools like loan-to-value ratios that are simple to implement.

Conference organised by: **Charles Goodhart** (FMG, LSE) and **Kevin James** (CCBS, Bank of England and FMG, LSE)



6TH MTS CONFERENCE: FIXED INCOME MARKETS AFTER THE CRISIS

13-14 December 2010

The first day of the 6th MTS conference on fixed income markets after the crisis took place at the London Stock Exchange.

Topics covered included bond pricing and market segmentation; and risk and liquidity in interbank markets. The presentations by Stéphane Guibaud (FMG, LSE), Norman Schürhoff (HEC, University of Lausanne and Swiss Finance Institute), James Vickery (New York Federal Reserve) and Jakub Kastl (Stanford University) were followed by a panel discussion on 'The outlook for the UK bond market in 2011 and beyond' chaired by Toby Fildes (Managing Editor, Euroweek).

The second day of the conference took place at the FMG, LSE. The morning session of the second day of the conference focussed on OTC markets and platforms. The three papers discussed topics such as price behaviour in opaque OTC markets; the relationships between hedging, risk sharing and risk taking; the effects of margin requirement; and lastly, trading fees' impacts on the choice of investors' order placement strategies and welfares in a system with both dealer market and limit order markets.

Haoxiang Zhu (Stanford University) presented 'Finding a good price in opaque over-the-counter markets'. The paper considered a fully rational, dynamic model of opaque over-the-counter markets in which a seller wishes to sell an asset to multiple buyers visiting them one at a time, whilst a buyer makes a quote and the seller can either accept or turn down their offer. There is no pre-trade transparency and repeat contact is allowed. A buyer does not observe negotiations elsewhere in the market and thus faces contact-order uncertainty. Zhu derived two main results under the above conditions. Firstly, the likelihood of repeat contact creates strategic pricing behaviour by quote providers. Repeat contact signals a reduced outside option, and results in a lower offer. Secondly, when the fundamental value of the asset is uncertain, the joint effect of contact-order uncertainty and lack of pre-trade transparency could lead to severe adverse selection and even market breakdown. The presentation highlighted

the role of market opacity in exacerbating adverse selection in decentralised markets and also shed light on bargaining models with outside options.

In the discussion, **Zhihua Chen** (University of Neuchâtel, Shanghai University of Finance and Economics and Swiss Finance Institute) remarked that the paper's implication, that repeat contacts worsen quotes from the revisited counterparty, is interesting yet difficult to test empirically.

Marie Hoerova (European Central Bank) then presented 'Risk-sharing or risk-taking? Hedging, margins and incentives', co-authored with Bruno Biais (Toulouse School of Economics) and Florian Heider (European Central Bank). In their work, the authors analysed the trade-off between the benefit of hedging in terms of enhanced risk-sharing and its costs in terms of hidden leverage that increases risk-taking incentives. They modelled hedging as the design of an optimal contract between a risk-averse insurance buyer and a risk-neutral insurance seller. If a seller learns that the hedge is likely to be loss-making, he will have less of an incentive to exert effort to reduce default risk of his other holdings, and this in turn creates counterparty risk. Their analysis identified a channel through which hedging with asymmetric information can cause otherwise independent asset classes to be correlated and lead to systematic risk. Another key finding from the paper is the effects of margins. Without risk-taking, margins improve risk-sharing even without being paid out and thus have an incentive effect. With risk-taking, margins have an insurance effect and protect buyers against counterparty risk, but they may also lead to more risk-taking. The policy implication is that while margin requirements could reduce the severity of moral hazard problems, poorly capitalised firms should be banned from the sale of protection.

In the discussion, **Ulf Axelson** (FMG, LSE) raised two issues with the model. The first is the negative externality which results from taking on valuable risky projects when there are moral hazard problems present with the rest of the firms. Secondly, margins can be privately optimal as well as socially suboptimal. He also identified an issue with the findings of the paper in that decreasing moral hazard will depend on the cost of the efforts being lower after margin calls. Axelson did not believe the model appropriate for considering contagion, central clearing, and capital requirements. Hoerova however maintained that the contagion effect from the buyer's risks to the seller's balance sheet risks is a vital part of the paper. Central clearing is also crucial in order for margins to exist and they therefore serve their incentive role.

Thierry Foucault (HEC Paris) presented his joint work with Jean-Edouard Colliard (Paris School of Economics) on 'Securities market structure trading fees and investors welfare'. The recent development in the securities market saw new platforms challenge OTC markets and exchanges. The paper addressed questions such as 'What are the impacts of current fee structures on trading platforms, participants, their trading strategies and the wider market and its efficiency?' The authors considered a riskless asset that trades on a dealer (OTC) market or a limit order market. In the limit order market, investors can choose to be 'makers' or 'takers' whilst in a dealer market they must trade at dealers' quotes with investors paying a trading fee to the operator of this market. They analysed the effect of inter-market competition on trading platforms' optimal pricing policy and investors' order placement strategies. A key new finding is that an increase in trading fees can increase



investors' welfare because it forces makers to post offers with a higher fill rate. This effect reduces the likelihood that investors resort to a dealer and improves welfare. Related to this argument, the model also implied that an intensification of competition amongst matchmakers did not necessarily improve investors' welfare. Finally the effects of make/take fees are examined. In their model, the make/take fee breakdown leaves the cum fee bid-ask spread unchanged and is neutral because the division of gains from trade between makers and takers is unaffected.

Amil Dasgupta (FMG, LSE) discussed the paper and raised the question of how general the non-monotonicity of fill rates is. He pointed out that this non-monotonicity arises from independence of λ and π , where λ is treated as parameters in the model. If λ is interpreted as inventory cost, then there is likely to be a link between λ and π . If low λ leads to low π , will the non-monotonicity still arise? He also suggested that the authors could consider more complex fee structures, such as membership submission fees etc., instead of restricting attention to a single type of platform fee.

The afternoon session, chaired by **Stephen Schaefer** (LBS) focussed on 'Trading and pricing in CDS markets', and included two presentations on the trading of CDS: the presence of arbitrage opportunities in the CDS markets during the financial crisis; and the exploration of the effect of CDS trading on prices.

Following the introduction, the session began with **Jennie Bai** (Federal Reserve Bank of New York), who presented her paper 'The determinants of the CDS-bond basis during the financial crisis of 2007-2009', co-authored with Pierre Collin-Dufresne (Columbia Business School). In this paper, the authors documented the presence of an extremely negative CDS-bond basis during the recent financial crisis that violates the no-arbitrage relationship. The authors then aimed to explain the basis using a regression model. They found that 'counterparty risk, funding risk and collateral quality have

strong explanatory power for the cross-sectional variation of the basis during the post-Lehman period'. The authors then tested different theories exploring the limits of arbitrage. In particular, they considered alternative hypotheses such as limited capital, market segmentation and slow reaction of the CDS market.

Christopher Polk (FMG, LSE), in his discussion of the paper, raised the need to use other measures for the basis of robustness. He argued that 'counterparty risk is overstated in this paper because of marking-to-market'. He also pointed out the importance of institutional detail being included in the analysis.

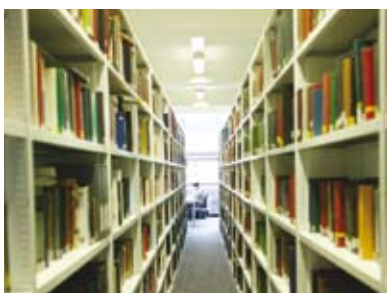
Hong Yan (Moore School of Business) then presented his work 'Does the tail wag the dog? The price impact of CDS trading' (joint with Dragon Yongjun Tang of the University of Hong Kong), in which they aimed to investigate if there is an effect from CDS trading on prices. The authors started their investigation by constructing a measure, Net Buying Interest (NBI), to measure latent trade imbalances between trades. They then found that NBI can predict CDS price changes. More precisely, they found that for the highest NBI group, CDS spread increases by 16 per cent. On the other hand, CDS spread falls by 10 per cent for the lowest NBI group. The authors then proceeded to investigate the channels through which NBI affects spreads. They found that while part of the price movement reflects information content, illiquidity also forms an important channel. The authors concluded that 'illiquidity enhances the price impact of trading'.

In the discussion, **Albert Menkveld** (VU University Amsterdam) considered using a control-group approach in this study. He questioned the use of stock price changes as a proxy for changes in fundamentals. He also posed a question about the appropriate definition of liquidity effect: whether it should be the speed of reversals or the size of price pressure.

The session ended with the keynote speech by **Arvind Krishnamurthy** (Kellogg School of

Management) entitled 'The demand for liquidity'. While the effect of liquidity is undisputed, the speech aimed to fill a gap in the literature on the quantitative magnitude of the effect of liquidity. Krishnamurthy went about doing this by investigating the aggregate demand for treasury bills. These securities are valued for their transaction liquidity and for being a safe store of value. He showed that changes in Treasury supply have large effects on a variety of yield spreads, and, as a result, Treasury yields were reduced by 72 basis points, on average over the period from 1926-2008. Krishnamurthy then explored the implications of his findings on a variety of questions, including: the value of liquidity; bank regulation; global imbalances; quantitative easing; and the international monetary system.

Conference organised by the **MTS Scientific Committee** which comprises of **Luca Bagato** (Università Cattolica di Piacenza), **Bruno Biais** (Toulouse University, IDEI and CNRS), **Thierry Foucault** (HEC, Paris and CEPR), **Marco Pagano** (Chairman of the Scientific Committee, University of Naples Federico II, and CEPR), **Gustavo Piga** (University of Rome Tor Vergata), and **Ernst-Ludwig von Thadden** (University of Mannheim).



REFORMING FINANCIAL REGULATION AND SUPERVISION: THE ROAD AHEAD

24 January 2011



Harald Benink (Tilburg University)

The FMG hosted a one day conference at LSE which brought together policymakers, academics and independent thinkers to discuss the road ahead for financial regulation and to highlight some of the shortcomings of the reform proposals currently being discussed. The European Shadow Financial Regulatory Committee also presented its statement on the recent Basel III accord.

Charles Goodhart (FMG, LSE) started the conference with his presentation on 'Designing credible resolution schemes for global financial institutions'. He critically evaluated the main proposals to deal with Systemically Important Financial Institutions (SIFIs) – the 'too big to fail' issue. He argued that the Basel III approach of enhanced loss absorbing capital requirements was not enough. With regards to better resolution mechanisms, the so-called 'living wills', Goodhart highlighted four key problems with this proposal: cross-border legal differences; international burden sharing; cross-border harmonisation of rules; and regulatory costs of recalibration of living wills.

The third major component of Goodhart's presentation was the proposals to make bondholders liable (CoCos). He argued that such proposals may be in the interests of bondholders who would prefer haircuts to costly liquidation. However, these proposals need to be thought through. He raised several questions that would need to be resolved, most importantly on the pricing of such debt and the contagion inherent in such a proposal. He was of the view that such 'bail-ins' may generate more crises happening earlier and might lead to a 'better kind of crisis'.

Commenting on this paper, **Rosa Lastra** (QMUL) pointed out some of the problems associated with SIFIs (problems of definition, problems of effective regulation and supervision, and problems of resolution and crisis management), and advocated the need for an adequate framework to deal with them. Since most SIFIs have a cross-border dimension, a cross-border solution, supra-nationally and/or internationally, is needed. She remarked that since SIFIs enjoy an implicit government guarantee which generates pernicious moral hazard incentives, that protection must be priced according to market mechanisms. She also highlighted the incentives of institutions to place themselves on either side of the boundary or regulatory perimeter. Lastra concluded by emphasising the need for an international understanding of insolvency and resolution procedures in the same way as we have an understanding – albeit imperfect – on capital. The case for credible resolution mechanisms for SIFIs is fundamental, so that the 'fear of failure' returns to banking and finance.

Kern Alexander (University of Zurich) presented his paper 'Reform of bank capital standards: Basel III and beyond'. He provided the audience with a broad overview of the evolution of the Basel regime before going on to focus on the unfinished agenda. He advocated enhanced levels of capital, in addition to liquidity requirements and leverage caps, linking assets to equity growth. He suggested that an IMF style financial stability tax on banks' non-core liabilities is worth considering and emphasised the need for bank liabilities to be composed primarily of retail deposits, followed by equity, with securitised products and repos forming a much smaller

fraction. Finally, he outlined the need for better risk management.

Tom Berglund (Hanken School of Economics, Helsinki), in his discussion of Alexander's presentation, highlighted the need for an optimal level of financial regulation. He pointed out that while tighter regulation had the benefit of reducing the potential cost of a crisis, either through prevention or by making it less costly, this benefit must be balanced against the cost of lost opportunity arising out of tighter regulation. He also discussed the role of capital ratios as a charge versus buffers.

The final item in the morning session was the



Charles Goodhart (FMG, LSE)

presentation of a statement by **Harald Benink** (Tilburg University), chairman of the European Shadow Financial Regulatory Committee (ESFRC). The ESFRC is a body of academics and other independent thinkers who meet twice a year to discuss issues in financial regulation and to issue policy recommendations. In their statement on Basel III the ESFRC recommended that:

- i. capital regulation should focus on simple ratios of capital to non-risk weighted assets;
- ii. contingent capital should be assigned an expanded role in required capital;
- iii. simple liquidity requirements should be introduced to complement capital requirements; and
- iv. supervisors should monitor metrics for changes in liquidity to obtain early warning signals of systemic problems.

Since banks can easily bypass complex regulations by optimising their structure, ESFRC's key message was that regulations need to be kept simple.

The first presentation in the afternoon was by **Clas Wihlborg** (Chapman University) who presented 'Reform of bank liquidity requirements'. He raised the issue that liquidity has become a somewhat obscure concept as a result of the increased role of securities on both sides of financial institutions' balance sheets. Basel III has added liquidity ratio requirements including LCR (Liquidity Coverage Ratio), NSFR (Net Stable Funding Ratio) and monitoring tools.

The requirement on LCR is that the stock of high-quality liquid assets divided by total net cash outflows (over the next 30 days under stress scenario) be greater than 1. This is an expanded reserve requirement with implications for monetary policy and can reduce the need for fire sales of risky assets subject to liquidity premium in a stress situation (lack of buyers). The requirement of NSFR is that the available amount of stable funding divided by the required amount of stable funding be greater than 1. This requirement addresses mismatch problems by reducing the need to refinance long maturity assets in the short-term market, and by increasing availability of short-term assets in case of fire sales needed. He also pointed out that all proposed liquidity ratios focus on capital regulation and solvency to reduce systemic risk and reduce the scope for externalities by constraining interconnectedness and mismatching. However, there is an efficiency cost: short-term funding as commitment and disciplinary device.

Peter Praet (Executive Director, National Bank of Belgium and Member, Basel Committee) gave the keynote speech titled 'The importance of systemically important financial institutions'. He mentioned that SIFIs are institutions whose disorderly failure, because of their size, complexity and systemic interconnectedness, would cause significant disruption to the wider financial system and economic activity. These could have the negative externalities of moral hazard, information contagion, interbank linkage, counterparty exposure and fire sale effects due to



Rosa Lastra (FMG, LSE)

the SIFIs' characteristics. He also briefly explained SIFIs' existence from several points: (1) relation between financial markets and institutions is both competitive and complementary: institutions help resolve asymmetric information problems in markets and influence risk distribution when it can provide tailored products and help to complete market where standardised products are traded; (2) the functions performed by financial system functions are stable, but the configuration of the landscape is dynamic.

At the same time, Praet also discussed how to address the problem of SIFIs. He mentioned that a holistic approach is needed, such as the FSB's recommendations on extra loss absorbency, improved resolution, enhanced supervision and financial infrastructures. In the short-run, some regulatory measures to contain the systemic risk of SIFIs, such as capital surcharge, liquidity surcharge and size restrictions, will play an important role. However, developing a robust framework of crisis management in global financial markets is likely to be a long-term process requiring improved cross-border resolvability. Finally, he mentioned that there will be some impact on SIFIs from many different angles including trading activities, large bank counterparties, leverage ratios and levies on large

financial institutions. In particular, there will be some potential impact on the organisation of the financial industry in different ways including property rights, and solvency regimes.

The conference ended with a panel discussion chaired by **Howard Davies** (LSE) on 'Financial regulation and supervision: the road ahead'. The panel consisted of **Gerard Hertig** (Swiss Federal Institute of Technology, Zurich), **Thomas Huertas** (FSA), and **Catherine Lubochinsky** (University of Paris 2). Huertas said there was still no 'endgame' for very large SIFIs, meaning they cannot be easily stopped without disrupting markets or requiring taxpayer help. He pointed out that if 'too big to fail' cannot be resolved, then a closer look at the structure of the institutions will have to take place. He hoped that this could be avoided through sensible discussions on the matter. The easy identification of so-called casino banking with investment banking may not however hold up. Huertas said bail-ins or the use of hybrid debt that can convert into capital-boosting equity in times of trouble, had a great deal of promise and might help avoid structural remedies. At the same time, Lubochinsky pointed out that there are some differences in the definitions of risk and uncertainty which creates confusion. Regulators should be careful when making regulations about risk and should not be confused about them. Hertig proposed a menu of mechanisms to improve the governance of 'normal times' financial supervisors (as opposed to resolution agencies and systemic risk boards). From an internal governance perspective, he proposed to enhance supervisory effectiveness by institutionalising strong CEOs. From an external governance perspective, market responsiveness would be improved by subjecting supervisors to reinforced disclosure requirements.

Conference organised by: **Harald Benink** (Tilburg University), **Rosa Lastra** (QMUL) and **Charles Goodhart** (FMG, LSE)



AXA-BANK OF ENGLAND CONFERENCE MEASURING SYSTEMIC RISK AND ISSUES FOR MACROPRUDENTIAL REGULATION

24-25 January 2011



Jon Danielsson (FMG, LSE)

The FMG and Bank of England organised a two-day conference, entitled 'Measuring systemic risk and issues for macroprudential regulation'. The theme of the conference was how the recent financial crisis has led to a shift in regulatory focus to systemic risk. This conference aimed to bring together researchers, regulators and practitioners to address related issues including measuring systemic risk, the impact for macroprudential regulations and policy implications.

Nikola Tarashev (BIS) opened the conference with an analysis on how the structure of interbank network affects the systemic importance of a bank with his presentation entitled 'Measuring the systemic importance of interconnected banks'. Focusing on systemic risk because of losses to banks' non-bank creditors, the paper proposed a measure of the systemic importance of financial institutions, called the Generalised Contribution Approach (GCA),

demonstrating its empirical implementation. The paper explored the two existing conceptually different approaches to measuring systemic risk: Participation Approach (PA) that approximates systemic risk as the expected losses of a bank conditional on particular systemic event; and the contribution approach founded in the Shapley value methodology to capture the systemic risk contribution of individual players in the cooperative games in a (non-interconnected) banking system. GCA takes into account the network structure of the banking system, and accounts explicitly for systemic risk stemming from a bank's exposure to exogenous systemic shocks as well as its role in propagating such shocks in the system.

The paper then empirically compared the alternative measures in stylised banking systems of different network structures with one calibrated from twenty large real-world banks. It was found that the interbank market increased systemic-wide Expected Shortfall (ES) by more than 30 per cent. This led to a general rise in banks' systemic importance, but the impact differed depending on their participation in the interbank market. For example, ES stayed roughly the same for concentrated networks and networks with more links, but systemic importance of individual banks differed across structure. Furthermore, while GCA is symmetric between lenders and borrowers, PA assigns higher systemic importance to lenders. Therefore, based on GCA, the paper concluded that given interconnectedness as a key driver of systemic risk, alternative measures of systemic importance differed materially and consistently. This implied that policy makers must consider suitable measures carefully according to the designated objectives.

The discussant **Matthew Willison** (Bank of England) directed attention to the intuition of considering the role of individual financial institutions in every sub-network where it has an impact, underlying the idea of Shapley values. He also noted that GCA not only measures whether or not a bank is systemically important, but also the extent to which it is.

Piergiorgio Alessandri (Bank of England) then presented a unified framework to assess the riskiness of systemic institutions entitled 'RAMSI: a risk assessment model for systemic institutions'. The RAMSI model is a quantitative dynamic general equilibrium model that tracks overall risks of the financial system over time. Taking a modular approach, the model integrates different sources of risk. In particular, it accounts for feedback effects and externalities across banks (contagion risk). The top module is a macroeconomic model that generates (distribution of) shocks for a range of macro variables. This then feeds into modules that track the impact of these shocks on banks' balance sheets and financial accounts, in terms of both credit risk and market risk. Another part of the model captures the feedback/externalities and hence the importance of network effects.

The presentation illustrated an application of the RAMSI model for distribution prediction. Using data from 10-12 major UK banks that account for around 80 per cent of UK lending, the model incorporates credit, interest rate and market risks. Most importantly, the model considers three interlinked feedback mechanisms: interbank lending; market liquidity; and funding liquidity. The model also has the scope to take into account correlations by looking at the joint density of bank capitalisation. In an application, a correlation of zero indicates good times, which approaches 1 during bad times. The resulting predicted distribution can be employed in stress testing, forecasting and policy experiments. A natural next step would be to combine the predictive densities from alternative, complementary models such as VaR.

The discussant, **Serafin Martinez Jaramillo** (Banco de Mexico) pointed out that the RAMSI model attempted to capture the contagion risk within the financial system, which is, however, hard to measure. Experience at the Banco de Mexico shows that it is crucial to consider contagion as simulations made without taking it into consideration produce very different results. One criticism of the model is that it requires a large amount of detailed modelling assumptions in each of the blocks.

In the second session of day 1 **Sigbjørn Atle Berg** (Norges Bank) presented 'Systemic surcharges and measures of systemic importance', which consisted of a brief review of recent research, followed by a discussion of its limitations and a set of recommendations going forwards. He noted that measures of systemic

risk are important for determining systemic surcharges, including capital requirements, liquidity requirements and potentially a tax on size. These need to be analysed in a systemic environment because of the substantial social costs associated with the failure of a systemic institution not taken into account privately by the shareholders. This in turn may imply that systemically important institutions fail too often. Such distortion can be reduced in two ways: reducing the impact of failures; or enhancing the resilience of systemically important institutions. The trade-off that needs to be taken into account (similar to the calibration of Basel capital requirement) is the divergence between the social and private costs of failures.

Surveying the measures researched in the literature, mainly CoVaR, conditional expected undercapitalisation, systemic risk insurance premium and GCA, the author made the following caveats. First, the basic trade-off of regulation in terms of cost saving during crisis periods against costs in normal times is not reflected in the proposed measures. Secondly, all measures assume outright failures, a situation that is unlikely to occur due to ex post efficiency of government intervention. The third caveat relates to the empirical nature of the methodologies that rely on market data, which is prone to cyclicity and endogeneity. Moreover, the existing measures largely neglect the liability side of systemic institutions' structure. Lastly, the rarely made distinction between common exposures and spill-over effects can be important in practice. Alternative or complementary tools need to be considered to deal with systemic surcharges, such as activity restriction, 'living will process' and special resolution regimes, with the latter considered most important by Berg.

The discussant **Geoffrey Wood** (Cass Business School) acknowledged the comprehensiveness of the survey, but pointed out that the concept of 'failure' which is repeatedly used in the paper might not be appropriate, as the cost of rescue is not the input at the time of injection, but should consider future benefits social-wide. He also argued that while additional regulation would certainly affect behaviour, the direction is not clear.

The last presentation of the day, titled 'Towards methods of measuring and mitigating systemic liquidity risk' was given by **Laura Kodres** (IMF). She presented three methods of measuring systemic liquidity risk, considered to be a blind spot in the crisis. She noted that systemic

liquidity risk has not been studied in great detail because of difficulties including the distinction and interrelation between market and funding liquidity, banks and shadow banks, and the mixture of solvency and liquidity risk. Such measurements are further hampered by the fact that the information and data needed are different from other areas. She observed that another focus that has not been explored is to consider the change in market infrastructure, and how to structure the market to incentivise better practice by market participants.

Starting from a discussion on the Basel III measures LRI (Liquidity Risk Index) and NSFR (Net Stable Funding Ratio), Kodres noted the fact that the liquidity requirements focus too much on an individual bank's maturity mismatch with insufficient attention regarding the systemic implications. She then proposed three methods to capture systemic liquidity risk in the order of increasing data requirements. The first method is to construct indices of liquidity conditions. The intuition behind this is that violations of arbitrage of well-established markets imply funding issues faced by arbitrageurs. This method is easy to employ and combines market and funding liquidity, however it is subject to market pricing, and the model is 'agnostic' about sources of the principle components which are the main planatory factors. The second method is a systemic risk-adjusted liquidity model that combines market and balance sheet information to estimate 'market implied' NSFR. This method computes a joint distribution and determines when they simultaneously fall below a threshold. While being flexible, this method produces too volatile results and faces the complication of aggregation. The third method is similar to the RAMSI model in spirit, accounting for the interrelation and the effect of asset/liability structure. The model is based on asking how much more capital is needed to forestall liquidity given systemic situation. This method integrates solvency and liquidity risks, and allows early identification of potential systemic risk benefiting from information on banks' positions. Nevertheless, the heavy reliance on data and structural modelling assumptions may have implications on robustness.

The discussant **Ole Rummel** (Bank of England) found the presentation to be 'a thorough discussion of an emerging toolkit'. He raised some concerns related to the interconnectedness in the market, and the implications on



Kevin James (CCBS, Bank of England and FMG, LSE)

risk aggregation within individual financial institutions. Another big problem is the need for information and data. At the end of the day public data still needs to be used, be this either balance sheet or financial market data, both of which must be handled with care considering issues such as creative accounting, or the extent of information content in the market.

The second day of the conference started with **Viral Acharya** (NYU) presenting his paper 'Measuring systemic risk' co-authored with Lasse Pedersen, Thomas Philippon and Matthew Richardson (all of NYU). Distresses of the financial system can have a negative externality on the real economy, and so they developed a simple economic model where financial firms internalise the external cost of systemic risk. Acharya showed that each financial institution's contribution to systemic risk can be measured as its Systemic Expected Shortfall (SES), ie, its propensity to be undercapitalised when the system as a whole is undercapitalised. Under this setting, they suggested a tax system that would make the financial institutions internalise the negative externality systemic distresses imposed on the economy. He demonstrated that their measure of systemic risk, SES, increases with the institution's leverage and with its expected loss in the tail of the system's loss distribution. Empirically, he showed that SES had the ability to predict emerging risks during the financial crisis of 2007-2009, in particular, (i) the outcome of stress tests performed by regulators; (ii) the decline in equity valuations of large financial firms in the crisis; and (iii) the widening of their credit default swap spreads.

Alistair Milne (Cass Business School) discussed the paper. He provided a brief summary and discussed the practical implementation of the measures of expected shortfall as well as what

would be the optimal taxation scheme under this model.

Next to present was **Tobias Adrian** (Federal Reserve Bank of New York). Adrian presented the paper 'Broker-dealer leverage and the cross-section of stock returns', co-authored with Erkko Etula (Federal Reserve Bank of New York) and Tyler Muir (Northwestern University). They developed a broker-dealer pricing model that tied asset prices to the balance sheet management of financial intermediaries. Their premise was that the balance sheet behaviour of financial institutions is systematically linked to asset prices. Evidence shows that there is a positive correlation between total asset growth and leverage for broker-dealers and any negative shocks to prices that lead to the disorderly unwinding of intermediaries' balance sheets will generate systemic risk. Their results also suggested that the broker-dealer pricing model may provide a common explanation for many asset pricing puzzles.

Alexander Schulz (Deutsche Bundesbank) discussed the paper and pointed out that although the authors identified a new mechanism for the generation of systemic risk, it is not as straight forward to apply the results to Europe where there is no broker-dealer.

The morning session closed with **Philipp Hartmann** (European Central Bank). Hartmann's presentation, 'Economic framework and analytical tools for macroprudential supervision' was not based on a specific paper, but on work being developed at the European Central Bank. He presented systemic risk as having three different components and discussed the most adequate models to deal with each of these components. The first is the origin of contagion, which can be either systematic or idiosyncratic. The second is the trigger, linked to the endogenous build-up and unravelling of widespread unbalances. The trigger can be either endogenous or exogenous. The last is the impact, which can be either simultaneous or sequential and linked to aggregate shocks to the system. The first two types of risk have to be analysed using contagion and spillover models whereas the last one requires stress tests. He concluded his presentation by presenting the Composite Indicator of Systemic risk (CISS). The CISS is composed of information from the asset markets, financial intermediaries and stress indicators and used as a way of gauging the level of systemic risk in the economy.

The presentation was followed by a discussion by **Charles Goodhart** (FMG, LSE). Goodhart emphasised the importance of the presentation and mentioned that, although the CISS is an interesting measure, there is still the urgent need for an indicator that actually anticipates crises. He also expressed the need for macroprudential supervision in the Eurozone to be tackled as a disaggregated exercise that takes the particularities of the different countries into account. Finally he discussed the characteristics of the new regulatory body for systemic risk in Europe, (ESRB [European Systemic Risk Board]) and pointed out that it will have a challenging task as it is a regulatory agency without any executive powers.

The afternoon session started with **Miguel Segoviano** (Mexican National Banking and Securities) introducing the Banking System Multivariate Density (BSMD) framework, which he developed in collaboration with Charles Goodhart in his presentation on 'Financial stability measures'. The BSMD defines the banking system as a portfolio of banks and thus embedded the banks' default inter-dependence structure at different times of the economic cycle. Theoretically, the BSMD is recovered using the so-called CIMDO-approach, which is a reduced-form methodology that improves density specification in the presence of restricted data. Empirically, therefore, the BSMD estimation does not require (restricted) information on specific banks' portfolios – (publicly available) market-based data suffice for such an exercise.

The applications of the BSMD methodology are many. Most importantly, straightforward manipulation of the BSMD yields partial probabilities of interest, such as spillover coefficients, contagion indicators, and the probability of cascade effects. Segoviano pointed out that the framework can be used for stress-testing as well as risk measurement. He also added that he and his coauthors are working with regulators and central banks around the world to apply the method to a diverse set of environments. One such example of cooperation is with **Raphael Espinoza** (International Monetary Fund), who took over the last part of this presentation. Espinoza explained how the BSMD method can be applied to the analysis of sovereign debt risk. In particular, he asked which respective part of a sovereign's risk spread can be explained by the

market pricing of risk in contrast to contagion effects and fiscal fundamentals.

The discussant of the session was **Dimitrios Tsomocos** (Said Business School, University of Oxford). He evaluated the research programme's aim to provide a framework that summarises the development of financial stability in a single quantitative manner. According to Tsomocos, the main advantages of the approach are that it includes direct as well as indirect effects; that it allows for dynamic correlation parameters; and that it explicitly emphasises distress. Its weaknesses lie in the fact that it is reduced-form and non-parametric and that, therefore, it does not allow for welfare evaluations. Tsomocos concluded by appreciating that the BSMD approach is the 'most promising road to a measure of financial stability that is both implementable and simple'.

Jon Danielsson (FMG, LSE) then presented the findings from two empirical projects that he is currently working on with Kevin James (CCBS, Bank of England and FMG, LSE) in his presentation titled 'A new perspective on systemic risk and prudential regulation. He argued that financial economists are searching for a so-called 'riskometer', providing the necessary information for implementing prudential regulation. However, according to Danielsson, the existing methodology provides only very unsatisfactory measures of risk: on an individual bank level, Danielsson and James showed that the commonly-used Value at Risk (VaR) differs by up to a factor of three depending on which underlying model is used. On a systemic level, the so-called CoVaR methodology, which calculates the VaR of the financial system conditional on one institution being in distress and which is the most popular systemic risk indicator, is even more imprecise according to the authors' findings. Alternative systemic risk indicators do not perform better in Danielsson and James' exercises.

Despite his negative assessment of the current state of knowledge, Danielsson provided a rather optimistic outlook on the future prospects of research and practice of regulation in the second part of his talk. He conceded that we do not have a lot of data for empirical estimation, especially because, in his view, the estimates of risk (correlations) in normal times are not a good indicator of their value in times of crisis. However, he noted that markets provided very valuable information that is currently underused

in regulatory practice. For example, during the financial crisis of 2008/09 markets were much faster to pick up Lehman Brothers' difficulties than the American regulators. He concluded his presentation by stating that in his view, regulation is the 'art of the possible': if the currently available risk meters are not good enough, it is important to combine them with all the existing prudential tools, to maximise the effectiveness of market discipline, and to tackle the underlying causes in the economy that lead to systemic risk, such as the inefficiencies in the housing market in the run-up to the last crisis.

Yaacov Mutnikas (Financial Services Authority) was the discussant for this talk. He agreed that the perfect model of systemic risk is an illusion. Nonetheless, he argued that, with modest ambitions, the currently available measures should be part of a diverse set of tools that the regulator can use in day-to-day applications. He also emphasised that one should strive to improve the models instead of giving up on them in the face of their (currently) perceived failure.

The conference concluded with a panel discussion made up of **Viral Acharya** (NYU), **Tobias Adrian** (FRBNY), **Jon Danielsson** (FMG, LSE), **Philipp Hartmann** (ECB) and **Laura Kodres** (IMF). It was chaired by **Charles Goodhart** (FMG, LSE) who asked each of the panelists to share their main lessons from the event.

Goodhart mentioned that Acharya's paper powerfully illustrated to him that effective risk weighting should be time, as well as state, dependent. He also gained a better insight about the robustness of systemic risk measures from Danielsson's paper.

Adrian stated that, for him, the most important insight from the conference was the distinction between local and global risk. For the former we have fairly well-developed measures while, for the latter, better structural models have to be developed – despite their reliance on some unsatisfactory assumptions.

Danielsson emphasised that a lot of progress has been made over the last two or three years. Before the crisis, the profession did not even have a clear notion of what systemic risk was, whereas the discussion is now about what works as a model or measure of systemic risk and what does not.

Hartmann felt that the conference provided him with a representative overview of the field. He pointed out some areas where further research

is clearly needed, most notably macroeconomic models that provide links of financial crises to the real economy.

Kodres stated that the main points for her were that (1) there should be a horse-race for the right model; that (2) the available data is insufficient and should be improved; (3) the right policy instrument to avoid excessive systemic risk has to be found; and that (4) a connection to the macroeconomy has to be established in order to understand the optimal tradeoff between credit growth and risk of financial distress.

Acharya provided thoughts on the issue that, contrary to the financial sector, deleveraging of households has not been achieved in the US. In his view, a better idea of the right policy instruments in this dimension has to be developed.

The remainder of the panel discussion was open to questions from the audience. The questions asked struck a balance between the technical details of the models that were presented and a more conceptual outlook about financial regulation and systemic risk.

Conference organised by: **Jon Danielsson** (FMG, LSE), **Kevin James** (CCBS, Bank of England and FMG, LSE) and **Charles Goodhart** (FMG, LSE)

FMG EVENTS

Conferences

FMG, Bank of England and HEIF4 conference – Macroprudential policy: Issues and challenges
2 November 2010

FMG and AXA conference – Financial intermediation, banking and macro-stability
2-3 December 2010

6th MTS conference on financial markets – Fixed income markets after the crisis
13-14 December 2010

FMG conference – Reforming financial regulation and supervision: The road ahead
24 January 2011

FMG, AXA and Bank of England conference – Measuring systemic risk and issues for macroprudential regulation
24-25 January 2011

Public Lectures

Private equity insider: a candid chat with Tony James
Felda Hardyman (LSE) and
Hamilton 'Tony' James (Blackstone)
23 February 2011

Best Ideas: Can fund managers beat the market?
Christopher Polk (FMG, LSE)
24 February 2011

Capital Markets Workshops

Going for broke: new century financial corporation, 2004-2006
Augustin Landier (Toulouse School of Economics)
17 November 2010

Indexing executive compensation contracts
Ernst Maug (University of Mannheim)
24 November 2010

Equilibrium credit ratings and policy
Francesco Sangiorgi (Stockholm School of Economics)
1 December 2010

Dissecting the effect of credit supply on trade: evidence from matched credit-export data
Daniel Paravisini (School of Business, Columbia University)
8 December 2010

Cyclicality of credit supply: firm level evidence
Bo Becker (Harvard Business School)
12 January 2011

Skin in the game: evidence from the online social lending market
Jörg Rocholl (European School of Management and Technology)
19 January 2011

Rollover risk: optimal but inefficient
Thomas Eisenbach (Princeton University)
26 January 2011

The determinants and impact of executive-firm matches
Yihui Pan (University of Minnesota)
2 February 2011

Propagation of financial shocks: the case of venture capital
Richard Townsend (Harvard University)
9 February 2011

Optimal design of internal capital markets
Andrey Malenko (Stanford Graduate School of Business)
16 February 2011

Best face forward: does rating shopping distort observed bond ratings?
Mathias Kronlund (University of Chicago)
23 February 2011

Lunchtime Workshops

Real estate prices and firm capital structure
Dragana Cvijanovic (FMG, LSE)
17 November 2010

Tracing the real effects of lending supply shocks
Philippe Mueller (FMG, LSE)
1 December 2010

Sources of entropy in dynamic representative agent models
Mikhail Chernov (FMG, LSE)
8 December 2010

Equity ownership and product prices
Ramin Baghai (London Business School)
12 January 2011

Does proxy voting affect supply and/or demand for securities lending?
Pedro Saffi (IESE Business School, University of Navarra)
19 January 2011

Opening the black box: internal capital markets and managerial power
Zacharias Sautner (University of Amsterdam)
26 January 2011

Are there too many safe securities? Securitization and the incentives for information production
Adi Sunderam (Harvard Business School)
2 February 2011

CEO contract horizon and investment
Moqi Xu (INSEAD)
9 February 2011

Communication and decision-making in corporate boards
Nadya Malenko (Stanford Graduate School of Business)
16 February 2011

London Financial Regulation Seminars

The road to better resolution from bail-out to bail-in

Tom Huertas (Financial Services Authority)
15 November 2010

Banking crises and the international monetary system in the great depression and now

Bill Allen (Cass Business School) and Richhild Moessner (BIS)
29 November 2010

A false sense of security: lessons for bank risk management from the crisis

Patricia Jackson (Ernst & Young)
13 December 2010

Banking structure and competition

Charles Goodhart (FMG, LSE)
17 January 2011

Privately optimal securitization and publicly suboptimal risk-sharing

Gilles Chemla (Imperial College London)
31 January 2011

PhD Seminars

All seminars are given by current LSE PhD students.

The impact of more frequent portfolio disclosure on mutual fund performance

Sitikantha Parida (FMG / Finance)
18 November 2010

Optimal investment firm beliefs and their implications for macroeconomic volatility

James Hansen (Economics)
25 November 2010

Rating based credit risk modelling

Ping Zhou (Finance)
9 December 2010

Intraday volatility forecast for FX market

Yiyi Wang (FMG / Finance)
13 January 2011

Systemic interaction risk

Toni Ahnert (Economics)
20 January 2011

Liquidity in order driven markets

Marceia Valenzuela and Ilknur Zer (both Finance)
27 January 2011

Corporate governance in the presence of social networks

Melania Nica (Economics)
3 February 2011

Heterogeneous beliefs and strategic asset allocation in money management

Shiyang Huang (FMG / Finance)
10 February 2011

What is inside the latent factors of the US yield curve? The role of Asian countries' reserve holdings

Wendy Yan (FMG / Finance)
17 February 2011

Overrating agencies: competition, collusion and regulation

Giorgia Piacentino (FMG / Finance)
24 February 2011



DISCUSSION PAPERS

DP 661 (PWC 14)

Institutional trade persistence and long-term equity returns

Amil Dasgupta, Andrea Prat and Michela Verardo

Recent studies show that single-quarter institutional herding positively predicts short-term returns. Motivated by the theoretical herding literature, which emphasizes endogenous persistence in decisions over time, we estimate the effect of multi-quarter institutional buying and selling on stock returns. Using both regression and portfolio tests, we find that persistent institutional trading negatively predicts long-term returns: persistently sold stocks outperform persistently bought stocks at long horizons. The negative association between returns and institutional trade persistence is not subsumed by past returns or other stock characteristics, is concentrated among smaller stocks, and is stronger for stocks with higher institutional ownership.

DP 662 (PWC 15)

Fund flows and asset prices: a baseline model

Dimitri Vayanos and Paul Woolley

We study flows between investment funds and their effects on asset prices in a simple two period version of Vayanos and Woolley (2010, VW). As in VW, flows cause assets to comove in ways unrelated to fundamentals, affect assets with high idiosyncratic risk the most, and raise the expected returns of funds experiencing outflows. We sketch how adding periods can generate other results of VW such as momentum, reversal, amplification, and fund managers' willingness to hedge against commercial risk. We also extend the VW framework to study how index redefinitions affect the price level and the extent of comovement.

DP 663

The vote is cast: the effect of corporate governance on shareholder value

Vicente Cuñat, Mireia Gine and Maria Guadalupe

This paper estimates the effect of corporate governance provisions on shareholder value and long-term outcomes in S&P1500 firms. We apply a regression discontinuity design to shareholder votes on governance proposals in annual meetings. A close-call vote around the majority threshold is akin to a random outcome, allowing us to deal with prior expectations and the endogeneity of internal governance rules. Passing a corporate governance provision generates a 1.3 per cent abnormal return on the day of the vote with an implied market value per provision of 2.8 per cent. We also find evidence of changes in investment behavior and long-term performance improvements.

DP 664 (AXA 6)

Boards of banks

Daniel Ferreira, Tom Kirchmaier and Daniel Metzger

We show that country characteristics explain most of the cross-sectional variation in bank board independence. In contrast, country characteristics have little explanatory power for the fraction of outside bank directors with experience in the banking industry. Exploiting the time-series dimension of the sample, we show that changes in bank characteristics are not robustly associated with changes in board independence, while changes in board experience are positively related to changes in bank size and negatively related to changes in performance. The evidence suggests that country-specific laws and regulations affect the composition of boards of banks mainly through requirements for director independence.

DP 665 (PWC 16)

Balance sheet capacity and endogenous risk

Jon Danielsson, Hyun Song Shin and Jean-Pierre Zigrand

Banks operating under Value-at-Risk constraints give rise to a well defined aggregate balance sheet capacity for the banking sector as a whole that depends on total bank capital. Equilibrium risk and market risk premiums can be solved in closed form as functions of aggregate bank capital. We explore the empirical properties of the model in light of recent experience in the financial crisis and highlight the importance of balance sheet capacity as the driver of the financial cycle and market risk premiums.

DP 666 (PWC 17)

An institutional theory of momentum and reversal

Dimitri Vayanos and Paul Woolley

We propose a rational theory of momentum and reversal based on delegated portfolio management. Flows between investment funds are triggered by changes in fund managers' efficiency, which investors either observe directly or infer from past performance. Momentum arises if fund flows exhibit inertia, and because rational prices do not fully adjust to reflect future flows. Reversal arises because flows push prices away from fundamental values. Besides momentum and reversal, fund flows generate comovement, lead-lag effects and amplification, with all effects being larger for assets with high idiosyncratic risk. Managers' concern with commercial risk can make prices more volatile.

DP 667 (PWC 18)

Fund flows and asset prices: a baseline model

Dimitri Vayanos and Paul Woolley

We study flows between investment funds and their effects on asset prices in a simple two-period version of Vayanos and Woolley (2010, VW). As in VW, flows cause assets to comove in ways unrelated to fundamentals, affect assets with high idiosyncratic risk the most, and raise the expected returns of funds experiencing outflows. We sketch how adding periods can generate other results of VW such as momentum, reversal, amplification, and commercial-risk management. We also extend the VW framework to study how index redefinitions affect the price level and the extent of comovement.

DP 668

Bank bailout menus

Sudipto Bhattacharya and Kjell G Nyborg

Bailing out banks requires overcoming debt overhang as well as dealing with adverse selection with respect to the quality of banks' balance sheets, in terms of heterogeneity in both the likelihood and extent of their potential shortfalls, of future asset values vis-à-vis contractual debt obligations. We examine bailouts that eliminate debt overhang, while attempting to minimize subsidies to banks' equity holders. When banks do not differ with respect to the extent of debt overhang, it can be fully overcome with the minimal amount of subsidies, providing each bank's equity holders no more than their pre-bailout values, with a partial new equity injection, or an asset buyout. When levels of debt overhang co-vary with underlying probabilities of default, we characterize the conditions for attaining a

similar minimal subsidy outcome, with a Menu of either equity injection or asset buyout plans, satisfying suitable self-selection constraints among bank types. These involve global rather than local conditions, with multiple intersections of indifference curves among types, and imply strictly greater funds injections than those needed to make existing debt default-free. We also explore the role of coupling asset purchases with providing the bailout agency. Options to buy bank equity, to enhance its capture of rents arising from new investments by banks. We compare its performance with equity injections on this dimension, as well as others such as post-bailout stakes held by prior inside equity holders of banks.

DP 669 (PWC 19)

Bond market clienteles, the yield curve and the optimal maturity structure of government debt

Stéphane Guibaud, Yves Nosbusch and Dimitri Vayanos

We propose a clientele-based model of the yield curve and optimal maturity structure of government debt. Clienteles are generations of agents at different life cycle stages in an overlapping-generations economy. An optimal maturity structure exists in the absence of distortionary taxes and induces efficient intergenerational risksharing. If agents are more risk-averse than log, then an increase in the long-horizon clientele raises the price and optimal supply of long-term bonds. But while a welfare-maximizing government caters to clienteles, it does not accommodate fully their demand, and limits issuance of long-term bonds to a level where these earn negative expected excess returns.

DP 670 (PWC 20)

Trading frenzies and their impact on real investment

Itay Goldstein, Emre Ozdenoren and Kathy Yuan

We study a model where a capital provider learns from the price of a firm's security in deciding how much capital to provide for new investment. This feedback effect from the financial market to the investment decision gives rise to trading frenzies, where speculators all wish to trade like others, generating large pressure on prices. Coordination among speculators is sometimes desirable for price informativeness and investment efficiency, but speculators' incentives push in the opposite direction, so that they coordinate exactly when it is undesirable. We analyze the effect of various market parameters on the likelihood of trading frenzies to arise.

DP 671

Stock prices under pressure: how tax and interest rates drive returns at the turn of the tax year

Johnny Kang, Tapio Pekkala, Christopher Polk and Ruy Riberio

We show that the level of interest rates determines the magnitude of mispricing at the turn of the tax year, as investors face the trade-off between selling a temporarily-depressed stock this year and selling next year, but delaying tax implications by one year. Interest rates do explain the predictable variation in US returns and selling behavior around the turn of the year. Similar results in the UK provide out-of-sample confirmation, as tax and calendar years differ. Moreover, part of the variation in the risks and abnormal returns of size, value, and momentum factors can be linked to tax-motivated trading.

SPECIAL PAPERS

DP 672 (PWC 21)

Revised version of DP 656 (PWC 12)

Trading and voting in distressed firms

Ioan F Olaru and Konstantinos E Zachariadis

We investigate the effect of the ability of 'non-traditional' funds to short-sell the equity of their debtors. This enables the funds to vote on the restructuring proposals of distressed firms, while at the same time they separate their voting rights from their economic exposure. The effect on firm value depends on the discrepancy between the markets for debt and equity, discrepancy in how each assesses the probability of a proposal being accepted. We show that if the assessments between the two markets are different then the presence of a non-traditional fund decreases firm value. Firm value, however, is unaffected if the assessments are the same.

DP 673

Micro frictions, asset pricing and aggregate implications

Jack Favilukis and Xiaoji Lin

We use asset pricing insights to study importance of micro-level frictions for aggregate quantities. In our model, the relevant stochastic variable is a stationary growth rate (necessary to produce high Sharpe Ratios in a Long Run Risk world), as opposed to a trend-stationary level of productivity. This naturally implies a heteroscedastic and time dependent aggregate investment rate; contributing to the recent debate between Khan and Thomas (2008) and Bachmann, Caballero, and Engel (2010), we find that non-convex costs are not necessary to match these moments. Our best model, combining convex and nonconvex costs, matches aggregate macro-economic and micro-level investment moments, as well as the high Sharpe Ratio of equity.

SP 193

Some help in understanding Britain's banking crisis 2007-09

Roger Alford

Although Britain's banking crisis received wide coverage in the media, this did not provide the public with any clearly structured account of its financial events and left most people feeling that they had no clear understanding of what had happened. To this extent the media failed in their duty to educate public opinion. The balance sheet approach set out here provides a clear and consistent framework that is essential for any real understanding of the crisis: how some banks came to face imminent failure and the operations by the Bank of England and the government that saved them. Following the crisis the most significant reform has been in the FSA, which has abandoned light touch regulation and reverted to something resembling the type of supervision exercised earlier by the Bank of England (which is now about to be given back responsibility in this field). This new regime promises to be effective. There have been many suggestions for reform; some leading ones are mentioned and several are criticized. The question of how to deal with a sectoral problem, such as Britain's housing boom, remains unresolved.

SP 194

The new architecture of financial regulation: will it prevent another crisis?

Josef Ackermann

(Dean Davies, Lord Turner) Ladies and Gentleman, In his recently published tome 'Why the West Rules – for Now', Stanford historian Ian Morris argues that human destiny is shaped by the efforts of people to cope with whatever is thrown at them. He observes, and I quote: 'History teaches us that when the pressure is on, change takes off,' end of quote. Indeed, it is the natural instinct of human beings to ask after every catastrophe: What can

we do to avoid a repetition of such an experience?

The financial crisis is no exception to the rule.

It has triggered a strong resolve on the part of market participants, authorities and rule-makers to prevent a recurrence of the events that brought our financial system, indeed our economies close to the point of collapse two years ago. As I will develop in greater detail in this lecture, I think it is fair to say that the collective efforts of all of us who have been working towards that objective are beginning to bear fruit. Before I start off, let me just mention en passant that the real subject of Professor Morris's book, namely an analysis of geopolitical power shifts across the century, is an aspect that is also pertinent in the debate on the consequences of the financial crisis. Just a few days ago, on the occasion of the IMF/World Bank Group Annual Meetings in Washington DC, we were once again able to witness the new balance of power between the West and the rising powers in Asia and Latin America. The debates on currency regimes, macroeconomic policies and influence in international organizations were a reminder that the financial crisis was not just an economic event. Rather, it will prove to be a watershed event for geopolitics, too. We would be well advised to keep this in mind when we discuss regulatory changes to achieve greater financial stability and not lose sight of the fact that regulation can create and destroy markets and companies – and especially so in the financial industry where factors of production are so mobile. Most rule-makers here in Europe are well aware of this. Indeed, this awareness partly explains why it is often so difficult to agree on regulation that strikes the right balance between competing objectives. These are legitimate discussions, which inevitably take time – and if that is the price for a sound evaluation of all potential consequences, it is a price well worth paying.

SP 196

Twin peaks: experiences in the Netherlands

Jeroen Kremers and Dirk Schoenmaker

Bankers, supervisors and policymakers have reason to be modest these days. A modest assessment of experiences with the Twin Peaks supervisory

model in the Netherlands would be that – other than in some countries with a different setup – the model itself has not been a factor contributing to financial disarray. Nevertheless also the Netherlands has had its share of profound financial sector failure, which Twin Peaks has not prevented. This paper explores in what areas the model has helped, and in what areas the Dutch experience points to possible improvements.

Thus the scope of the paper is not to assess what went right and wrong in financial supervision in the Netherlands in a broad sense, but only to provide a first inventory of issues possibly related to the Twin Peaks model as introduced in the Netherlands in 2002. In doing so, we can rely on recent work evaluating the adequacy of the two Dutch supervisors' performance, notably the parliamentary De Wit (2010) report about causes of the financial crisis and the Scheltema (2010) report about the failure of DSB Bank.

SP 197

The changing role of central banks

Charles Goodhart

Although Central Banks have pursued the same objectives throughout their existence, primarily price and financial stability, the interpretation of their role in doing so has varied. We identify three stable epochs, when such interpretations had stabilised, ie,

- a) The Victorian era, 1840s to 1914;
- b) The decades of government control, 1930s to 1960s;
- c) The triumph of the markets, 1980s to 2007.

Each epoch was followed by a confused interregnum, searching for a new consensual blueprint. The final such epoch concluded with a crisis, when it became apparent that macro-economic stability, the Great Moderation, plus (efficient) markets could not guarantee financial stability. So the search is now on for additional macro-prudential (counter-cyclical) instruments. The use of such instruments will need to be associated with controlled variations in systemic liquidity, and in the balance sheet of the Central Bank. Such control over its own balance sheet is the core, central function of any Central Bank, even more so than its role in setting short-term interest rates, which latter **could** be delegated. We end by surveying how relationships between Central Banks and governments may change over the next period.

FORTHCOMING PAPERS

The value premium in general equilibrium

Xiaoji Lin and Jack Favilukis

What is the consumption-CAPM missing? An information theoretic framework for the analysis of asset pricing models – working title

Christian Juillard

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