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Stress-testing the Banking System

Stress tests are used in risk management by banks in order to determine how certain crisis scenarios would affect the value of their portfolios, and by public authorities for financial stability purposes. Until the first half of 2007, interest in stress-testing was largely restricted to practitioners. Since then, the global financial system has been hit by deep turbulences, including the fallout from sub-prime mortgage lending. Many observers have pointed out that the severity of the crisis has been largely due to its unexpected nature and have claimed that a more extensive use of stress-testing methodologies would have helped to alleviate the repercussions of the crisis. This book analyses the theoretical underpinnings, as well as the practical aspects, of applying such methodologies. Building on the experience gained by the economists of many national and international financial authorities, it provides an updated toolkit for both practitioners and academics.

Mario Quagliariello is a senior economist in the Regulation and Supervisory Policies Department of the Bank of Italy. He has been the representative of the Bank of Italy in a number of international working groups dealing with financial stability issues and has published several articles in international and Italian journals. He has a PhD in economics from the University of York.

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Contributors

Editor

Mario Quagliariello is a senior economist in the Regulation and Supervisory Policies Department of the Bank of Italy. He has been the representative of Banca d'Italia in a number of international working groups dealing with financial stability issues and has published several articles in international and Italian journals. His interests concern macro-prudential analysis and stress tests, Basel 2 Capital Accord and procyclicality, the economics of financial regulation. He has a Ph.D. in economics from the University of York (UK).

Contributors

Patrizia Baudino joined the Financial Stability Board (FSB) in 2007. She is seconded from the European Central Bank (ECB), which she joined in 2002 after completing her Ph.D. at Princeton University. At the FSB, as well as at the ECB, she works on financial stability issues.

Michael Boss is a member of the Financial Stability Analysis Division at the Oesterreichische Nationalbank (OeNB), where his main working area is quantitative financial stability analysis and stress-testing. In cooperation with colleagues from the OeNB's Research Department and academia, he initiated and co-headed the project 'Systemic Risk Monitor', which is presented in this book. He regularly participates in missions of the International Monetary Fund (IMF) to Central and Eastern European countries as an expert on financial stability analysis. Prior to joining the OeNB in 1999 he was a research assistant at the Vienna Institute for Advanced Studies.

Francesco Cannata is Head of the Regulatory Impact Assessment Unit in the Regulation and Supervisory Policies Department of the Bank of Italy. He holds an M.Sc. in finance from the Cass Business School (UK) and a Ph.D. in finance from University 'Tor Vergata', Rome (Italy). His main interests are the economics of financial regulation, Basel 2 and credit risk.

Mike Carhill is Director in the Risk Analysis Division (RAD) of the Office of the Comptroller of the Currency since September 2003. RAD employs quantitative risk modelling experts who specialise in one of about one dozen lines of business to advise bank examiners, bankers and policymakers on the

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state-of-the-art in risk management information systems. He holds a Ph.D. in monetary theory from Washington University.

Olli Castrén has worked for the ECB since 1999. In his current job as principal expert in the Financial Stability Division, he coordinates the analysis of the euro area banking sector and also many of the briefing notes to the ECB executive board members. From 1999–2004, he worked as Senior Economist in the Directorate General Economics of the Bank. Prior to joining ECB, he worked at the Bank of Finland and Bank of England, and finished his Ph.D. in 1998 (Warwick University, UK).

Mathias Drehmann currently works as an economist at the Bank for International Settlements. After finishing a Ph.D. from the University of Bonn, he worked for the Bank of England and briefly for the European Central Bank. His main expertise lies in measuring financial stability as well as credit and liquidity risk modelling.

John Fell is Head of the Financial Stability Division of the ECB and editor of the ECB's *Financial Stability Review*. He is also Chairman of the Task Force on Macro Stress-Testing of the Banking Supervision Committee (ECB). He previously worked as an advisor on capital market issues in the Monetary Policy Directorate of the ECB, at the European Monetary Institute and the Central Bank of Ireland. He holds postgraduate degrees in economics (University College of Dublin) and in finance (Dublin City University).

Adam Głogowski works as an economist at the National Bank of Poland. His main areas of responsibility include the development of stress-testing methodologies for the Polish banking system as well as contributing to the Financial Stability Report. He holds a Master's degree in economics from the Warsaw School of Economics.

Takashi Isogai is Deputy Head of the International Affairs Section of the Financial Systems and Bank Examination Department at the Bank of Japan. He received an M.A. in information engineering from Shinshu University (Japan). His main expertise lies in credit and market risk model analysis, software development in related fields and computer science.

Gerald Krenn joined the Oesterreichische Nationalbank in 1997 as part of the banking inspections team with a focus on internal market risk models. He is now working with the Financial Stability Analysis Division as a specialist for quantitative methods of financial stability analysis and stress-testing. He holds a Ph.D. in computer science from Technical University Vienna, where he was a research assistant prior to joining the Nationalbank.

Ulrich Krüger joined the Deutsche Bundesbank in 1999 and started to work for the Banking Supervision Department in 2002. He is a senior economist and carries out quantitative research related

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to Basel 2 and credit risk. He was involved in the Quantitative Impact Studies organised by the Basel Committee between 2001 and 2006. Before joining Deutsche Bundesbank he completed a Ph.D. in mathematics.

Sebastiano Laviola is Head of the International Cooperation Division in the Regulation and Supervisory Policies Department of the Bank of Italy. He is the Chairman of the Working Group on Macroprudential Analysis of the Banking Supervision Committee (ECB) and of the Subgroup on Operational Networks of the Committee of European Banking Supervisors.

Franka Liedorp is Policy Advisor with De Nederlandsche Bank. She works in the Quantitative Risk Management Section, focusing on a new solvency framework for insurance companies. Before that, she worked in the Supervisory Strategy Section, on a range of strategic topics, including the analysis of interbank contagion, internationalisation of banks and the risk of reinsurance.

Juri Marcucci holds a Ph.D. in economics from the University of California, San Diego. He works in the Research Department of the Bank of Italy, which he joined in 2004. He has been a lecturer at the University of Bologna since 2003. His research interests are in financial econometrics, forecasting and applied econometrics. His work has appeared in several journals.

Clément Martin joined the Banque de France in 2006, and is currently an economist in the Banking Studies Division of the French Banking Commission. He graduated from ENSAE, obtained a Master's degree in economics from the University of Paris–Dauphine and a Master's degree in international relations from the University of Paris–Assas.

Marina Moretti is Deputy Chief of the Financial Sector Policy Division in the IMF's Monetary and Capital Markets Department. She is currently seconded to the secretariat of the Financial Stability Board in Basel. Prior to joining the IMF in 1999, she served as Financial Economist at the World Bank and at the Organisation for Economic Co-operation and Development (OECD).

Marc Pröpper works as a senior policy advisor for De Nederlandsche Bank. Areas of his work include the Financial Assessment Framework for pension funds in the Netherlands, the future solvency and supervisory standard for insurance companies and stress-testing. Marc graduated as a physicist from the University of Utrecht and worked for several years on ALM and risk management for a large financial conglomerate. He regularly publishes articles on insurance and pensions.

Claus Puhr worked as a research assistant at the University of Applied Science Wiener Neustadt before he joined the Financial Stability Analysis Division of the Oesterreichische Nationalbank in 2005 to support the implementation of the 'Systemic Risk Monitor' presented in this book. He has

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also spent time at the Bank of England to help develop a similar quantitative systemic risk assessment model.

Steffen Sorensen is Senior Consultant at Barrie and Hibbert. Prior to joining Barrie and Hibbert he finished a Ph.D. at the University of York in financial econometrics and worked as an economist in the monetary analysis and financial stability areas of the European Central Bank and the Bank of England.

Stéphanie Stolz is an economist in the Financial Sector Policy Division in the IMF's Monetary and Capital Markets Department. Prior to joining the IMF in 2006, she served as an economist in the Micro and Macro Prudential Analysis Division of the Deutsche Bundesbank's Banking and Financial Supervision Department and at the Kiel Institute for the World Economy.

Marco Stringa works as a senior economist in the Monetary Analysis Department of the Bank of England. His professional interests span most aspects of financial markets. He studied at the Universities of Warwick and Bologna, and holds the CFA qualification.

Martin Summer is Head of the Economic Studies Division at the Oesterreichische Nationalbank (OeNB). Before joining the OeNB in 2000 he worked as a lecturer at the Universities of Vienna, Birmingham and Regensburg. He also worked as a visiting researcher at the Bank of England and the Financial Markets Group of the London School of Economics in 2004. His research interests are banking regulation and systemic risk, financial stability and financial economics.

Mark Swinburne is Assistant Director, and Chief of the Financial Sector Policy Division in the IMF's Monetary and Capital Markets Department. Current responsibilities include oversight and development of the Financial Sector Assessment Program, including quantitative assessment methodologies such as stress-testing. Prior to joining the IMF in 1994, he held senior advisor and senior manager positions in the Reserve Bank of New Zealand.

Muriel Tiesset is Deputy Head of Banking Studies Division of the French Banking Commission, specifically in charge of the stress-testing and risk measurement team. After graduating from ENSAE, she joined the Banque de France in 1998 and was initially appointed in the Economics Department, in charge of forecasting and monetary policy analysis. She also obtained a Master's degree in economics from the London School of Economics and spent one year on secondment at the Bank of England, in the Financial Stability Department.

Vincenzo Tola joined the Banking Supervision Department of the Bank of Italy in 2005. He has a Master's degree in quantitative risk management from the University of Palermo (Italy) and a Ph.D. in economics from the Università Politecnica delle Marche (Italy). His main interests are credit risk modelling, financial markets, decisions and games theory.

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Maurizio Trapanese is a senior economist in the Regulation and Supervisory Policies Department of the Bank of Italy. He holds an M.Sc. in economics from the University of Warwick (UK). His main interests are financial stability, macroprudential analysis and crisis management. He chairs the Crisis Management Task Force of the Committee of European Banking Supervisors.

Nico Valckx has worked for the ECB since 2002. His responsibilities in the Financial Stability Division include monitoring large banks and analysis of financial stability issues. He worked for two years as Advisor in the ECB office in Washington DC and previously was Secretary of the ESCB Working Group on Banking Developments. Prior to joining ECB, he worked for the Bank of Finland, De Nederlandsche Bank and, as a research associate, for the Belgian Fund for Scientific Research. He finished his Ph.D. in 2000 (Antwerp University, Belgium).

Iman van Lelyveld is Senior Policy Advisor with De Nederlandsche Bank and Chairman of the Basel Committee Research Task Force on stress-testing. In addition, he holds an appointment as Associate Professor at Radboud University. He has published widely on risk management, both from an individual institutional as well as from a systemic point of view.

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Foreword

Past and recent events have shown the disruptive power of financial crises. The direct costs of the crises on the financial system – however measured – are high; indirect effects to the entire economic system may be dramatic and long-lasting.

Looking at the experience of the past century, one remains astonished by the recurring tendency of the financial system to accumulate risk and leverage over a number of years, to then suddenly change sentiment and discard risk sharply and indiscriminately. While markets, asset types, players involved and the triggering event differ from one episode to the next, risk accumulation cycles tend to be similar. Crises have also shown that risks and vulnerabilities for the financial system do not stem only from endogenous developments but – probably much more frequently – are the consequence of changes in the macroeconomic and financial environment.

While these recurrences do not make crises more predictable, they have stimulated public authorities to search for ways of reducing the likelihood and impact of crisis events. One of the main lessons drawn from past turbulences is that it is important to complement the supervision of individual institutions with a constant monitoring of conditions of the system as a whole.

Reducing the impact of financial instability entails the development of a comprehensive kit of tools, ranging from forecasting techniques to preventive policy measures, to effective management and resolution devices. The first line is obviously trying to prevent the crisis from breaking out. The identification of risk sources and the prediction of potential threats are therefore crucial elements of any financial stability toolbox.

In that respect, macroeconomic stress tests are increasingly considered as the basic, indispensable tool of any systematic effort to reduce the likelihood and impact of crisis events. Stress-testing *per se* is not new – it is just an evolution of more primitive 'what if' thinking – but it has become much more structured and sophisticated in recent times. Testing the resilience of the financial system to a situation of stress – along with the smooth working of

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financial stability arrangements – is a top priority for the authorities responsible for safeguarding financial stability.

This book provides the reader with a systematic presentation of the latest developments in the field of stress-testing, taking advantage of the experience of colleagues from leading financial supervisory authorities and central banks. The first part of the volume introduces the reader to the main methodological aspects of stress-testing and explains the theoretical underpinning of different tools. The second part gives a comprehensive and updated overview of stress-testing approaches in various countries.

Given the difficulty in identifying the next crisis, the design of extreme but plausible stress tests is of great value: if understood and used correctly, they may strengthen the awareness of policy-makers on new risk factors as well as on the resilience of major institutions, markets and infrastructures under stress conditions. While technical aspects are certainly essential for ensuring the reliability and practical usefulness of such simulations, human judgment – as pointed out in many chapters – is also a central component of stress-testing. Therefore, the exchange of experiences among experts of various countries can help improve methodologies and develop a common language for checking the robustness of different approaches and interpreting the outcome of the simulations.

Notwithstanding the undeniable advances of the methodologies and applications, it is fair to say that the framework has not yet reached a steady state. Almost all contributors very openly claim that the challenges for stress-testing are still significant and there is room for further developments.

As Governor Draghi argued in the aftermath of the sub-prime crisis, 'every crisis leaves policy-makers shaken by the poorness of their forecasting ability. While it is sometimes possible to see the risk factors clearly, it is nevertheless impossible to predict the precise moment that the market will choose to trigger the crisis, the exact forms this will take or the links decisive for its propagation.' Indeed, every crisis is a lesson for the authorities and an incentive to enrich the toolkit at their disposal. Any progress in stress-testing methodologies does represent a valuable step in this direction.

Giovanni Carosio
Bank of Italy, Deputy Director General

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The seeds of this book were planted some years ago, when I was a young economist at the Bank of Italy and involved in the technical team responsible for developing new stress-testing methodologies for the incoming Italian Financial Sector Assessment Program (FSAP). I owe many more debts that I can possibly acknowledge, but I wish to thank Maurizio Trapanese, who initiated me to macroprudential analysis, and Sebastiano Laviola, who encouraged me to work on stress tests.

The project of a book on macroeconomic stress tests has become reality because so many colleagues and friends from either the Bank of Italy or other prominent financial institutions have enthusiastically agreed to contribute to it. I am obviously very indebted to all the contributors, but I am particularly grateful to Michael Boss, Mathias Drehmann, Gerald Krenn, Sebastiano Laviola, Juri Marcucci, Claus Puhr, Steffen Sorensen, Marco Stringa, Martin Summer and Maurizio Trapanese, who agreed to write their chapters when the 'probability of default' of the project was terribly high.

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