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### Financial regulations : intermediation, stability, and productivity : conference highlights

#### Provided in Cooperation with:

Asian Development Bank (ADB), Manila

*Reference:* (2017). Financial regulations : intermediation, stability, and productivity : conference highlights. Mandaluyong City, Metro Manila, Philippines : Asian Development Bank.

This Version is available at:

<http://hdl.handle.net/11159/2361>

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# FINANCIAL REGULATIONS: INTERMEDIATION, STABILITY, AND PRODUCTIVITY

CONFERENCE HIGHLIGHTS



# **FINANCIAL REGULATIONS: INTERMEDIATION, STABILITY, AND PRODUCTIVITY**

**CONFERENCE HIGHLIGHTS**



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Printed in the Philippines.

Publication Stock No. ARM178912-2

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# CONFERENCE PROGRAM

## MONDAY, 16 JANUARY

- 9:00 a.m. WELCOME REMARKS**  
Wong Nai Seng, Monetary Authority of Singapore
- 9:15 a.m. KEYNOTE SPEECH**  
**Shadow Banking: Economics and Policy**  
Stijn Claessens, Federal Reserve System
- 10:15 a.m. Break**
- 10:45 a.m. SESSION 1: REGULATING CAPITAL FLOWS**  
Session Chair: Bernard Yeung, National University of Singapore  
**Regulating Capital Flows at Both Ends: Does it Work?**  
Atish R. Ghosh, International Monetary Fund (presenter)  
Mahvash S. Qureshi, International Monetary Fund  
Naotaka Sugawara, International Monetary Fund  
Discussant: Livio Stracca, European Central Bank
- 11:35 a.m. Macroprudential Policies, Capital Flows, and the Structure of the Banking Sector**  
John Beirne, European Central Bank (presenter)  
Christian Friedrich, Bank of Canada  
Discussant: Elis Deriantino Naiborhu, Warwick Business School
- 12:25 p.m. Lunch**
- 2:10 p.m. SESSION 2: MORTGAGE FINANCING AND SMALL BUSINESS**  
Session Chair: Naoyuki Yoshino, Asian Development Bank Institute  
**Mortgage Lending, Banking Crises and Financial Stability in Asia**  
Peter J. Morgan, Asian Development Bank Institute (presenter)  
Yan Zhang, Asian Development Bank Institute  
Discussant: Ji Huang, National University of Singapore



- 3:00 p.m.**      **The Effectiveness of Housing Collateral Tightening Policy**  
Sumit Agarwal, National University of Singapore  
Cristian Badarinza, National University of Singapore (presenter)  
Wenlan Qian, National University of Singapore  
Discussant: Qin Yu, National University of Singapore
- 3:50 p.m.**      Break
- 4:20 p.m.**      **Regulating China's Peer to Peer Lending Market: The Role of Information Disclosure**  
Bihong Huang, Asian Development Bank Institute (presenter)  
Xiao Chen, Jinan University  
Dezhu Ye, Jinan University  
Discussant: Wenlan Qian, National University of Singapore
- 5:10 p.m.**      Adjourn
- 6:00 p.m.**      Cocktail Reception and Dinner  
KAZ Japanese Fusion Sushi

## TUESDAY, 17 JANUARY

- 9:00 a.m.**      **KEYNOTE SPEECH**  
**Finance and Growth – What Have We Learned**  
Thorsten Beck, Cass Business School
- 10:00 a.m.**      **SESSION 3: LENDING AND IMPACTS AT THE FIRM LEVEL**  
Session Chair: Cyn-Young Park, Asian Development Bank  
  
**By a Silken Thread: Regional Banking Integration and Pathways to Financial Development in Japan's Great Recession**  
Mathias Hoffmann, University of Zurich (presenter)  
Toshihiro Okubo, Keio University  
Discussant: Cyn-Young Park, Asian Development Bank
- 10:50 a.m.**      Break
- 11:05 a.m.**      **Banks Credit and Productivity Growth**  
Fadi Hassan, Trinity College Dublin (presenter)  
Filippo di Mauro, National University of Singapore  
Gianmarco I.P. Ottaviano, London School of Economics  
Discussant: Davin Chor, National University of Singapore

- 11:55 a.m.**      **Credit Misallocation during the Financial Crisis**  
 Fabiano Schivardi, Bocconi University (presenter)  
 Enrico Sette, Bank of Italy  
 Guido Tabellini, Bocconi University  
 Discussant: Toshihiro Okubo, Keio University
- 12:45 p.m.**      Lunch
- 2:15 p.m.**      **SESSION 4: MODELLING FINANCIAL REGULATION**  
 Session Chair: Filippo di Mauro, National University of Singapore
- A DSGE Model to Assess the Post Crisis Regulation of Universal Banks**  
 Olivier de Bandt, Banque de France (presenter)  
 Mohammed Chahad, Banque de France  
 Discussant: Peter Rosenkranz, Asian Development Bank
- 3:05 p.m.**      **Financial Sector Origins of Economic Growth Delusion**  
 Frederic Malherbe, London Business School  
 Michael McMahon, University of Warwick (presenter)  
 Discussant: Antonio Fatas, INSEAD
- 3:55 p.m.**      Break
- 4:25 p.m.**      **Prudential Policies and Their Impact on Credit in the United States**  
 Seung Jung Lee, Federal Reserve System  
 Paul Calem, Federal Reserve Bank of Philadelphia  
 Ricardo Correa, Federal Reserve Board (presenter)  
 Discussant: Frederic Malherbe, London Business School
- 5:15 p.m.**      Adjourn
- 5:30 p.m.**      Cocktail Reception and Buffet Dinner  
 NUS Business School
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### Session Format

Presentation 25 minutes, Discussants 10 minutes, Open discussion 15 minutes

### Organizing Committee

- Alexander Popov, European Central Bank
- Fadi Hassan, London School of Economics
- Bernard Yeung, National University of Singapore
- Filippo di Mauro, National University of Singapore
- Edward Robinson, Monetary Authority of Singapore
- Cyn-Young Park, Asian Development Bank
- Peter Morgan, Asian Development Bank Institute



# CONFERENCE HIGHLIGHTS



The financial sector's fundamental economic and social function is to efficiently allocate capital and distribute risk. Regulations inevitably affect the attainment of these goals. And since the Global Financial Crisis, financial sectors in most countries face re-regulation, although implementation varies. Financial sector market structure, the characteristics of financial institutions, and other factors also vary considerably by country. This is economically important, as different types of financial institutions have different target clients, capabilities, funding sources, risk exposure, and regulatory constraints. Further, similar regulations might have very different economic consequences in countries with different financial market structures and financial institutions.

In keeping with these issues, Wong Nai Seng of the Monetary Authority of Singapore in his welcome remarks underscored important aspects of financial regulation. First, policy makers need to carefully account for all the effects of financial regulation implementation. An assessment therefore needs to identify whether reforms have had the intended and unintended side effects.

Second, financial regulation and supervision reforms must be kept consistent and coordinated. Cross-border coordination of macroprudential policies is one dimension worth investigating in this area. This requires the identification of various types of risks and spillovers and their effects.

Third, it is recommended that policy makers always keep track of the evolving risks and vulnerabilities of the financial landscape, such as that financial technology, widely known as fintech, carries a lot of risks yet can also promote financial inclusion.

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The financial sector's fundamental economic and social function is to efficiently allocate capital and distribute risk.

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To discuss the issues, this Financial Regulations: Intermediation, Stability and Productivity conference gathered leading academics, central bankers, financial regulators, and international financial organizations to discuss theory, practice, and policy implications.

Among the many interesting presentations over the two days, the highlights were keynote lectures from Stijn Claessens, Senior Adviser of the Board of Governors of the United States (US) Federal Reserve System, and Professor Thorsten Beck, of the Cass Business School in London.

The first highlighted the main roles of shadow banking to provide (i) securitization to give the market safe assets and (ii) collateral intermediation, to reduce counterparty risk and thus promotes secured transactions. However, Mr. Claessens also noted that we do not yet have a fully sound understanding of the implications associated with the emergence of shadow banking activities. This therefore remains an important item on future research agenda.

In the second address, Mr. Beck reviewed relations between finance and economic growth, concluding that while finance can have positive impact on economic growth and thus welfare, its relationship exhibits “non-linearities”. That is, while the positive impact for less developed economies is clear, the effect is less pronounced for high-income countries. In addition, it also depends on the structure of the economies’ financial markets (bank- or market-based).



Wong Nai Seng

## KEYNOTE SPEECH—SHADOW BANKING: ECONOMICS AND POLICY



### STIJN CLAESENS

Head of Financial Stability Policy, Monetary and Economic Department  
Bank for International Settlements

Stijn Claessens represents the BIS externally in senior groups, including the Financial Stability Board, the Basel Committee on Banking Supervision and the G20. Within the BIS, he leads policy-based analyses of financial sector issues and oversees the work of the Committee on the Global Financial System and other committee secretariats. Between 1987 and 2006, he worked at the World Bank in various positions. From 2007 to 2014, he was Assistant Director in the Research Department of the International Monetary Fund. From 2015 to early 2017, he was Senior Adviser in the Division of International Finance of the Federal Reserve Board. He taught at the New York University business school and the University of Amsterdam.

The talk started with an overview of the financial structures, both globally and in G-4<sup>1</sup> economies, and to what extent structure matters for economic growth and financial stability. As income rises, the financial structure tends to shift away from a bank-based towards a more market-based system. This pick-up can also be observed in the G-4 economies, even though the euro area, the United Kingdom (UK), and Japan are still primarily bank-based. Only the US economy has financial structure that is primarily market-based. This yields important implications, such as that as income rises, the contribution to growth of the banking sector declines and of the stock markets increases.



Stijn Claessens

In financial crises, Mr. Claessens noted that credit crunches are generally deeper in a bank-based system, but that volatility and procyclicality tend to be higher in financial systems that are primarily market-based. For instance, a positive equity shock can lead to increased leverage and thus reinforce procyclicality. The volatility component represents the major concern of market-based systems, which hints that it is not a panacea. Still, advanced economies tend to need more debt, which markets can, presumably, finance more efficiently.

The presenter then reviewed shadow banking in general, its economic impacts, and possible policy implications. To avoid the usual confusion about what shadow banking is, the keynote speech used the definition: “all financial activities, except traditional banking, which require a private or public backstop to operate”.

<sup>1</sup> Euro area, Japan, United Kingdom, and the United States.



The presentation also noted the crucial need for “backstop” in shadow banking, which distinguishes it from the usual intermediated capital market activities, such as market-making, broking and underwriting, and related entities, such as custodians, hedge funds, and investment companies. Backstops can come in the form of franchise value of a bank or insurance company, a government guarantee, or a legal privilege.

Mr. Claessens identified two important shadow banking functions. The first refers to securitization, which can provide safe, short-term assets and be used as collateral for secured market transactions. The risks associated with securitization include regulatory arbitrage by banks, risk-management mistakes, and a disregard of tail risks. Some of these remain latent during good times, but materialize during crisis, such as in the form of fire sales.

The second main function of shadow banking is collateral intermediation to help reduce counterparty risk and to facilitate and promote secured transactions. Typically, only a few institutions, all systemically important financial institution (SIFIs), are involved in this process. This concentration can entail systemic risks.

For the policy implications, meanwhile, it is first very important to understand the underlying nature of shadow banking systems and how to measure it. Appropriate policy responses are not all conclusive yet. Mr. Claessens noted that properly addressing regulatory arbitrage, regulating shadow bank entities, and shadow banking’s interaction with monetary policy are the important policy issues to keep in mind.

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## SESSION 1: REGULATING CAPITAL FLOWS

Chair: Bernard Yeung, National University of Singapore

**T**he first session comprised two papers that capture recent findings in regulation of cross-border capital flows. One paper addressed the effects of capital flow regulation both in source and recipient countries, and the second the effectiveness of macroprudential policies in managing cross-border bank flows.

### REGULATING CAPITAL FLOWS AT BOTH ENDS: DOES IT WORK?

Atish R. Ghosh, International Monetary Fund (presenter)

Mahvash S. Qureshi, International Monetary Fund

Naotaka Sugawara, International Monetary Fund

Discussant: Livio Stracca, European Central Bank



#### ATISH REX GHOSH

Assistant Director, and Chief, Systemic Issues Division, Research Department  
International Monetary Fund

Atish Rex Ghosh's current assignment involves a wide variety of analytical work on issues related to the stability of the international monetary system, including exchange rate regimes, external balance dynamics, capital flows and capital controls, monetary and foreign exchange intervention policies, debt sustainability, and public finance. Formerly Assistant Professor of Economics and International Affairs, Princeton University, he is the author of four books and of numerous articles in scholarly journals.

The first paper examined whether cross-border capital flows can be regulated by imposing capital account restrictions in both source and recipient countries, as John Maynard Keynes and Harry Dexter White originally advocated some 70 years ago.

To this end, bilateral data on cross-border bank flows from 31 source to 76 major recipient countries over 1995–2012 was used, and combined with a novel dataset on various outflow and inflow related capital controls and prudential measures in source and recipient countries. The findings suggest that capital account restrictions at either end can significantly influence the volume of cross-border bank flows, with restrictions at both ends associated with a larger reduction in flows. The findings highlight useful scope for welfare-enhancing policy cooperation between



**Atish Rex Ghosh**

source and recipient countries to better manage potentially volatile financial flows, as is also envisaged under the Basel III “reciprocity” principle.

The discussion revealed the obstacles to international cooperation on capital controls. It is difficult to design capital control cooperation by country pairs, as countries are subject to different institutional constraints (such as the EU Treaty for EU countries and OECD Code for OECD countries). While a shared diagnosis of the risks of financial integration is needed, it is unlikely to materialize, especially between advanced and emerging countries, as interests likely diverge. A more global approach, such as in the form of a global financial safety net, may be a better alternative.

### MACROPRUDENTIAL POLICIES, CAPITAL FLOWS, AND THE STRUCTURE OF THE BANKING SECTOR

John Beirne, European Central Bank (presenter)

Christian Friedrich, Bank of Canada

Discussant: Elis Deriantino Naiborhu, Warwick Business School

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Findings suggest that capital account restrictions at either end can significantly influence the volume of cross-border bank flows.

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**JOHN BEIRNE**

Economist, European Central Bank

John Beirne is an economist at the European Central Bank (ECB), where he has worked since 2007. His research areas focus on international finance and applied macroeconomics. He has recently published papers in leading academic journals on volatility spillovers and contagion in global asset markets and the effectiveness of macroprudential policy in managing global capital flows. Prior to working at the ECB, he worked for a number of years as an economist in the private sector with Klynveld Peat Marwick Goerdeler, and also spent a shorter period at the International Monetary Fund.

Using a large sample of advanced and emerging market economies over 1999–2012, the second paper examined the effectiveness of macroprudential policies in containing cross-border bank inflows and how the structure of the banking sector may affect the effectiveness of respective policies.

Conditioning on the structure of the banking sector in the macroprudential policy implementing country, the paper found that greater regulatory quality and a higher credit-to-deposit ratio increase the effectiveness of those policies, while a higher cost-to-income ratio has the opposite effect. If all three financial variables are evaluated at the median, the marginal effect of the preferred macroprudential policy measure leads to a reduction of international bank inflows in percent of gross domestic product (GDP) by around half a percentage point, and is only marginally significant. However, when the more favorable 25th percentiles of their respective distributions are considered, the paper found that in response to the same macroprudential measure, a reduction of bank inflows of 3.44 percentage points, which is highly statistically and economically significant. The size of this reduction

increases to 5.39 percentage points when the 10th percentiles are used for the evaluation. Additionally, the paper found that the structure of the domestic banking sector determines asset class spillovers from macroprudential policies within countries, while geographical spillovers from macroprudential policies are a function of banking sector conditions both at home and abroad.

During the discussion, it was noted that capital controls are targeted to reduce capital inflows, macroprudential measures aim at containing the build up of systemic risk. It might therefore be difficult to draw conclusions about the effectiveness of macroprudential policies based on the effects of cross-border capital inflows. It was noted, however, that massive capital inflows may increase systemic risk, underlining the relevance of such inflows to macroprudential policies.

## SESSION 2: MORTGAGE FINANCING AND SMALL BUSINESS

Chair: Naoyuki Yoshino, Asian Development Bank Institute

Two of the contributions presented in this session tackled issues of mortgage lending. In particular, the session discussed the relationship of such lending to financial stability and the effectiveness of tightening measures of housing collateral. The other paper assessed the effects of information disclosure on peer-to-peer lending.

### MORTGAGE LENDING, BANKING CRISES, AND FINANCIAL STABILITY IN ASIA

Peter J. Morgan, Asian Development Bank Institute (Presenter)

Yan Zhang, Asian Development Bank Institute

Discussant: Ji Huang, National University of Singapore



#### PETER J. MORGAN

Senior Consulting Economist  
Asian Development Bank Institute

Peter Morgan's research areas are macroeconomic policy and financial sector regulation and reform. Recent publications include "The Role and Effectiveness of Unconventional Monetary Policy" and "Unregulated Entities, Products and Markets: Challenges for Monitoring and Regulation". Previously he served in Hong Kong, China as Chief Asia Economist for HSBC, responsible for macroeconomic analysis and forecasting for Asia. Before that, he was Chief Japan Economist for HSBC, and earlier held similar positions at Merrill Lynch, Barclays de Zoete Wedd, and Jardine Fleming.

The main contribution of the first paper was to exploit the relationship between the share of mortgage lending in total bank loans and measures of financial stability, because housing or mortgage loans have often been associated with the development housing price bubbles and financial crises. However, mortgage loans could also contribute to financial stability by increasing the diversity of bank assets. Increased mortgage loans could also promote financial inclusion. Most related studies so far have looked instead at the effects of mortgage lending growth and general credit growth on the risk of financial crises.



The authors estimate the effect of the share of mortgage lending by individual banks (together with control variables) on two measures of financial stability—bank Z-score (a measure of the risk of a bank becoming insolvent) and the ratio of non-performing loans (NPL ratio) to total loans. They find evidence that an increased share of mortgage lending tends to be positive for a bank's financial stability, specifically by lowering the probability of default by financial institutions and reducing the ratio of non-performing loans. However, if the mortgage share exceeds a critical level of about 50%–70% of total loans, the incremental impact on financial stability turns negative, in line with the notion that asset diversification increases financial stability, whereas asset concentration is negative for financial stability.

Further interesting findings are as follows: First, significant differences in the behavior of the bank financial stability measures between crisis and noncrisis periods are detected. Following crisis periods, banks' financial stability is negatively affected by both larger asset size and a higher mortgage shares. In particular, during crisis, the stability-enhancing level of the mortgage ratio is reduced by about 12–23 percentage points.

Second, focusing on Asian banks reveals that they tend to exhibit above average financial stability measures during noncrisis periods, but are more vulnerable than average in crisis periods. In particular, increases in the mortgage ratio are more negative for Asian banks than for the sample as a whole. The presenter pointed out that this finding needs further investigation. Third, a higher level of regulatory quality is found to improve both financial stability measures, but the effects of macroprudential measures are mixed.

These findings suggest that mortgage lending can contribute to financial stability up to a certain point, although this point is lower during crises. Therefore, it remains a challenge for policy makers to adequately balance the expected improvement in financial stability due to asset diversification against any negative impacts of easier lending standards leading to a rapid increase in mortgage lending. This highlights the need for prudent monetary policy and macroprudential policy measures such as loan-to-value ratios to forestall the development of such bubbles.

During the discussion, a number of participants suggested that the results may be driven by (potentially country specific) economic and financial conditions at the time, particularly whether or not the housing market was generally stable or showing signs of overheating because of rapid mortgage loan growth. Depending on where the country was in the financial cycle, the relationship could switch between negative and positive. It was suggested to incorporate measures of housing price inflation, housing price volatility, mortgage loan growth or total loan growth, and the monetary policy stance into the model to examine their impacts on the relation between the mortgage loan ratio and financial stability.

## THE EFFECTIVENESS OF HOUSING COLLATERAL TIGHTENING POLICY

Sumit Agarwal, National University of Singapore

Cristian Badarinza, National University of Singapore (presenter)

Wenlan Qian, National University of Singapore

Discussant: Qin Yu, National University of Singapore



### CRISTIAN BADARINZA

Assistant Professor  
National University of Singapore

Cristian Badarinza is also a Faculty Affiliate of the Institute of Real Estate Studies, an Associate Fellow with the Oxford-Man Institute of Quantitative Finance, University of Oxford, and a Network Associate of the Centre for Economic Policy Research, London. His research interests are in the areas of residential real estate, household finance and financial economics. Previously, he has been a Postdoctoral Fellow at Saïd Business School, a Research Assistant in the Monetary Policy Research Division of the European Central Bank in Frankfurt am Main.

The second presentation, tackling the issue of the effectiveness of policies that are designed to tighten housing collateral conditions, showed that these macroprudential policies can lead to adverse selection in the market for residential mortgage loans. The authors investigated the effects of a unique policy measure implemented in Singapore, whereby the upper limit on loan-to-value ratios for borrowers that had at least one loan outstanding was reduced from 90% to 80% and the cash down-payment requirement was increased from 5% to 10% of the collateral value.

The results reveal, on a horizon of up to one year after the policy roll-out, a significant composition change towards a riskier type of borrowers that are twice more likely to become delinquent relative to a comparable non-treated cohort. This pattern is explained by the fact that worse credit outcomes are driven by selection effects, especially because one cannot identify a change in financial savings or consumption behavior for these borrowers. On the supply side, financial institutions are not decreasing the overall pool of loanable funds, while on the demand side, borrowers fail to correctly assess either housing market growth or the policy impact, and will overstretch their home investments. More optimistic investors are likely to overestimate their repayment ability, especially amid tighter collateral requirements and potentially binding liquidity constraints.



This evidence suggests that leverage should be best designed as a package of complementary measures, in that the observed phenomenon can alter the transmission mechanism that policy makers usually assume, and delay and deteriorate the effectiveness of ad hoc measures meant to deter speculation in the housing market. Hence, this research is highly relevant for countries either implementing or considering macroprudential measures, such as upper limits on loan-to-value ratios.

The audience confirmed that the findings seem to be consistent both with the expectations of the policy maker and the actually observed outcomes. The Monetary Authority of Singapore, for example, has indeed decided to complement the first round of cooling measures with a set of regulations aimed at curbing household mortgage lending. The experience of recent years has shown that this type of package can be very effective. Also, similar policy measures have recently been implemented in the UK. It was pointed out that the mechanism that drives the higher incidence of mortgage penalties should be explored further, such as by using data on vacancy rates for rental properties.

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An increased share of mortgage lending tends to be positive for a bank's financial stability.

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### REGULATING CHINA'S PEER TO PEER LENDING MARKET: THE ROLE OF INFORMATION DISCLOSURE

Bihong Huang, Asian Development Bank Institute (presenter)

Xiao Chen, Jinan University

Dezhu Ye, Jinan University

Discussant: Wenlan Qian, National University of Singapore



#### BIHONG HUANG

Research Fellow  
Asian Development Bank Institute

Bihong Huang's research interests include labor, environment, development, and financial economics. Her work has been published in books and refereed journals, including *China Economic Review*, *Economic Modelling*, *Energy Economics*, *Global Economic Review*, *Journal of Banking and Finance*, *Review of Development Economics*, and *World Economy*. Previously, she was on the academic staff of Renmin University of China and University of Macau.

The last presentation in this session addressed the role of voluntary and unverifiable information disclosure and its impact on peer-to-peer (P2P) lending when hard information is unavailable.

The explosive growth of the P2P market, alongside advances of digital technology, underpins the importance of this topic. Compared with the traditional credit market, online P2P lending is easy to access, provides a new investment channel, and improves the efficiency of social funds. However, information asymmetry remains a critical issue in this market, as both lenders and borrowers are



anonymous to each other. Moreover, there are no financial intermediaries to investigate the creditworthiness of the borrowers. Thus, lenders decide whether to provide funding or not mainly based on the information provided by the borrowers. Hence, information disclosed by borrowers, compulsory and voluntary, is the most important source for lenders to infer the quality of the borrowers.

Although P2P growth continues to outpace risk controls and regulations, the role of the P2P-lending platform is defined in most countries as an intermediary provider of online lending information. This implies the critical importance of studying the role of information disclosure and verification in attenuating information asymmetry and inefficiencies of online financing.

Using the data from Renrendai, a leading lending platform in the People's Republic of China, the research documents and analyzes the role of voluntary information disclosure in the P2P lending market. It is found that funding success is significantly related to voluntary information disclosure. A single item of voluntary information disclosure helps to improve the funding success rate by 35.3%. The impact is even more pronounced for those borrowers with a lower credit rating. This research indicates that information disclosure is critical for funding success and policy makers should closely monitor it to better regulate the P2P lending market.

The discussion focused on potential reasons why certain investors might not voluntarily release their information and whether a defaulted borrower would have equal chances of getting other credit. As most of the borrowers in the dataset only borrowed once, the latter point remains a challenge to examine.



## KEYNOTE SPEECH—FINANCE AND GROWTH: WHAT HAVE WE LEARNED



### THORSTEN BECK

Professor of Banking and Finance  
Cass Business School

Thorsten Beck is also a research fellow of the Centre for Economic Policy Research (CEPR) and the CESifo. He was professor of economics from 2008 to 2014 at Tilburg University and the founding chair of the European Banking Center from 2008 to 2013. Previously he worked in the research department of the World Bank and has also worked as consultant for, among others, the European Central Bank, the Bank of England, the BIS, the IMF, the European Commission, and the German Development Corporation. His research, academic publications and operational work have focused on two major questions: What is the relationship between finance and economic development? What policies are needed to build a sound and effective financial system? Recently, he has concentrated on access to financial services, including SME finance, as well as on the design of regulatory and bank resolution frameworks.

**T**his talk discussed the findings of the finance and growth literature over the past 2 decades and pointed to some recent findings and a rethinking of financial sector challenges since the global financial crisis.

Mr. Beck noted that growth benefits from finance, which significantly supports economic development, but that this relationship entails important nonlinearities. In particular, the relationship between finance and growth varies across countries—systematically so with GDP per capita.

Also, the structure of finance seems to matter. For less developed countries, development of banking systems seems more important for economic development, while for more developed countries, markets seem more important. While financial development is important in supporting economic development in middle-income countries reaching the “financial-possibilities frontier”, its positive effects in high-income economies seems to be declining. One underlying reason is the changing composition of recipients of finance as economies become richer. Only the enterprise component of bank lending can be linked robustly to economic growth, whereas lending to households seems to have no significant effect on growth, which is consistent with ambiguous effects predicted by economic theory. Therefore, the increasing share of household credit in total credit in high-income countries can partly explain why the relationship between finance and growth declines in higher income countries.

At the same time, finance can also increase an economy’s fragility. In fact, it goes somewhat hand in hand with the mechanism, which supports economic growth. That is, the main benefit of the financial system stems from the fact that short-term savings and deposit facilities are channeled into longer-term investments can also turn into an agency problem between savers and entrepreneurs, incentivizing banks to take an unhealthy amount of risk, which in turn may lead to fragility.

Moreover, the presentation highlighted that poorly designed financial safety nets—explicit or implicit—can have negative effects as it potentially further distorts the already distorted risk-



taking behavior of banks. For instance, bailout expectations, liquidity insurance, and procyclical regulatory standards can lead to an overexpansion of the financial system, with negative repercussions for stability and ultimately growth.

Finally, it was mentioned that financial inclusion is only one channel through which finance affects income inequality and poverty, but it might perhaps not be the most important one that alleviates income inequality.

This lecture also touched upon the question whether an optimal level of finance exists. In this, the concept of a financial-possibilities frontier was introduced. Both the level of the frontier as well as the current level of an economy's financial development has implications on the best policy responses. If the frontier level is too low, market developing policies might be advantageous. On the one hand, if one is below the frontier, measures that promote competition, reduce regulatory constraints, and market enabling policies would be beneficial. On the other, if an economy has already passed the frontier, an incentive-compatible regulatory framework and market-harnessing policies would be suitable policy responses.



## SESSION 3: LENDING AND IMPACTS AT THE FIRM LEVEL

Chair: Cyn-Young Park, Asian Development Bank

Contributions in Session 3 discussed the role of efficient bank lending channels, primarily focusing on crisis episodes. It was shown that financial integration can mitigate the effects of liquidity shocks, capital misallocation can dampen an economy's productivity growth, and the aggregate real effects associated with zombie lending are rather marginal.

### BY A SILKEN THREAD: REGIONAL BANKING INTEGRATION AND PATHWAYS TO FINANCIAL DEVELOPMENT IN JAPAN'S GREAT RECESSION

Mathias Hoffmann, University of Zurich (Presenter)

Toshihiro Okubo, Keio University

Discussant: Cyn-Young Park, Asian Development Bank



#### MATHIAS HOFFMANN

Professor of International Trade and Finance, Department of Economics  
University of Zurich

Mathias Hoffmann's research focuses on the macroeconomic aspects of international financial integration and on the link between financial markets and the macro-economy more generally. His recent published articles include papers on the determinants of international capital flows and imbalances, the international transmission of business cycles, on international risk sharing and banking regulation. Prior to arriving in Zurich, he was Professor at the University of Dortmund in Germany and a Lecturer at Southampton University (UK).

The first paper finds that the real effects of bank liquidity shocks depend not only on the size of the shock to the banking sector (the bank-lending channel) but also on the ability of borrowers to substitute one source of credit for another (the firm-borrowing channel). Specifically, small firms are usually particularly dependent on bank credit and find it hard to obtain alternative sources of funding when their main bank is negatively affected by a liquidity shock. This paper draws attention to a potentially important additional channel of adjustment: the reallocation of credit that happens through the internal capital markets of regionally integrated banks.

The bursting of Japan's property price bubble was a major shock to the lending capacity of the entire banking sector, but it hit integrated banks particularly hard. However, in contrast to local banks, integrated banks could reallocate credit between prefectures to those areas where they had the most bank-dependent customers (small firms). It was shown that this credit reallocation substantially muted the real impact of the liquidity shock on prefectures with many bank-dependent small firms.

The results have several interesting policy implications. First, they draw attention to a potentially important channel of adjustment after a major shock to bank liquidity: the reallocation of credit within banks. Second, they show how regional differences in de facto financial integration can be the outcome of different historical pathways to financial development. These differences can persist even if there are no formal barriers to capital flows within a country, as is clearly the case for modern Japan. This result may have implications for regional business cycle transmission in many countries in which banking markets have traditionally been regionally segmented. Examples include Germany's Volksbanken and Sparkassen, Spain's Caixas, and the US, where banking markets were segmented along state borders until the 1990s. Lastly, results also inform the debate about the trade-offs between banking integration and regionalization facing Europe as it moves towards a banking union.

The discussion rotated around the question whether the specific mechanisms that mattered for the regional segmentation of banking markets during Japan's lost decade could also be expected to be at work in other international settings. However, the lesson from the paper for banking unions and banking integration in other parts of the world is rather that regional segmentation is likely to persist de facto long after the formal de jure integration of banking markets is likely to be completed (such as in Europe).

Participants discussed that Japan's lost decade illustrates that persistent lending relationships may also lead to hold-up lending to the borrower when the lender is in distress, thus de facto segmenting banking markets and leading to adverse real effects for the economy.

## BANKS CREDIT AND PRODUCTIVITY GROWTH

Fadi Hassan, Trinity College Dublin (Presenter)

Filippo di Mauro, National University of Singapore

Gianmarco I.P. Ottaviano, London School of Economics

Discussant: Davin Chor, National University of Singapore



### FADI HASSAN

Assistant Professor of Economics  
Trinity College Dublin

Fadi Hassan is also a Research Associate at the CEP, London School of Economics, and a Fellow at the Bank of Italy (for the year 2016/17). He is an applied economist with a focus on international and development economics (both macro and micro). He has been an Advisor to UniCredit Bank and a consultant to the European Central Bank, European Commission, European Investment Bank and the World Bank.

The second paper focused explicitly on the link between bank credit and firm-level productivity from both a theoretical and empirical perspective. In advanced economies, domestic credit to private nonfinancial corporations is about 90% of GDP, and bank credit represents a relevant fraction of the liabilities of nonfinancial corporations, highlighting the importance of efficient capital allocation. This implies that banks should invest capital in the firms that are expected to have higher returns and withdraw it from those with poorer prospects.

To investigate this lending channel, the paper used an overlapping generations model of entrepreneurs that need to invest in either short-term or long-term capital where the trade-offs arise from expectations on productivity growth between the short- and long-term, the presence of a credit constraint, and a shock that can hit the long-term investment. The relation between credit and either contemporaneous or future productivity growth under complete and incomplete credit markets is derived.

The main predictions of the model, exploiting a novel firm-level dataset that offers granular and comparable measures of productivity and bank credit for France, Germany, and Italy, are assessed by estimating an extended set of elasticities of bank credit with respect to a series of productivity measures of firms.

Following the main derivations of the model, the authors focused not only on the relation between bank credit and productivity during the same year, but also between credit and future productivity.

The estimates show a eurozone core-periphery divide. That is, the estimates for France and Germany are consistent with complete markets, whereas, for Italy, they are consistent with incomplete markets. The implication is that credit allocation in Italy turns to be suboptimal to the productivity patterns expected by firms with

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For less developed countries, development of banking systems seems more important for economic development, while for more developed countries, markets seem more important.

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respect to France and Germany. Hence capital misallocation by banks can be a key driver of the long-standing slow productivity growth that characterizes Italy and other periphery countries. Moreover, the results show that in all countries the allocation of credit among small-medium firms tend to be more efficient than for large firms.

During the discussion, the policy relevance of this research question that the paper puts forward was highlighted, and the clear intuitions of the theoretical predictions noted. A few suggestions on how to enrich the empirical exercise were discussed.

### CREDIT MISALLOCATION DURING THE FINANCIAL CRISIS

Fabiano Schivardi, Bocconi University (Presenter)

Enrico Sette, Bank of Italy

Guido Tabellini, Bocconi University

Discussant: Toshihiro Okubo, Keio University



#### FABIANO SCHIVARDI

Rodolfo DeBenedetti Professor  
of Entrepreneurship  
Bocconi University

Fabiano Schivardi is also full Professor at Luiss University. His research interests include corporate finance, industrial organization, and applied microeconomics. Previous positions held include Full Professor at the University of Cagliari; Head of the Industrial Organization Unit, Research Department, Bank of Italy; visiting fellow at Harvard Economics Department; and Economist, Research Department, Bank of Italy.

The third presentation addressed the important dimension of a weakened banking sector during financial crises. There is a widespread perception in the policy debate that under-capitalized banks can prolong depression by misallocating credit to weaker firms on the verge of bankruptcy and restraining credit to healthy borrowers.

This perception is supported by evidence for Japan during the “lost decade” and, more recently, in the euro area during the financial crisis. The paper explored the extent and consequences of credit misallocation in Italy during and after the eurozone financial crisis, investigating two major questions: first, what bank characteristics are more conducive to zombie lending? Second, what is the cost of zombie lending in lost economic activity and misallocation of real resources?

Using a unique dataset that covers almost all bank-firm relationships in Italy for 2004–2013, the authors focused on the most extreme form of credit misallocation, namely, loans granted to firms that clearly are no longer viable—zombie firms. They found that low-capital banks engaged in significantly more zombie lending than other banks. This effect is only present from 2008 onwards, and it is not apparent before the financial crisis, possibly because capital ratios were not yet a concern. More precisely, from 2008 to 2013 bank credit drops by almost 8% every year on average. But banks with a capital ratio below the median provide 2 percentage points of additional yearly credit growth to zombie firms than stronger banks do (a 25% increase relative to the average). The conclusion is that weak banks misallocate credit, because they are more likely to keep lending to nonviable firms.

Regarding the adverse real effects of credit misallocation on healthier firms and on aggregate economic activity, the central result is that bank under-capitalization has only negligible (absolute) effect on their growth during recession. This holds for several indicators of economic activity, such as the wage bill (a proxy for employment), the capital stock, and revenues. Similar effects are found in terms of firm exit, although, in this case, low bank capitalization reduces the survival rate of healthy firms.

Results suggest that an injection of capital of 4 billion euro to weaker banks would have increased yearly output growth 0.20%–0.35% during 2008–13. During this period, output in the sample on average shrank almost 2% per year. Thus, the contribution of zombie lending to this overall negative performance is only 10%–20%, and stems almost entirely from the extensive margin and the composition of firm exits. This suggests that zombie lending is likely to have played a role in deepening the crisis, but a rather marginal one: the ultimate causes of greater recessions are different.

The subsequent discussion comprised suggestions on how to improve or develop the analysis. In particular, some comments noted that it is important to consider alternative definitions of a zombie. The discussion also focused on the policy implications of the results of the paper, which stated clearly that effects associated with zombie lending were only a minor contribution to the otherwise sharp recession that hit the Italian economy during the eurozone financial crisis. It was also raised that these results could imply that it could be beneficial to keep certain zombies alive during crises.

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Capital misallocation  
by banks can be a  
key driver of long-  
standing slow  
productivity growth.

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## SESSION 4: MODELLING FINANCIAL REGULATION

Chair: Filippo di Mauro, National University of Singapore

The last session “Modelling Financial Regulation” discussed the effects of post-crisis regulation of universal banks, the question whether the financial sector plays a role in an unsustainable buildup of GDP growth prior to financial crises, and the impact of prudential policies on credit in the US.

### A DSGE MODEL TO ASSESS THE POST CRISIS REGULATION OF UNIVERSAL BANKS

Olivier de Bandt, Banque de France (Presenter)

Mohammed Chahad, Banque de France

Discussant: Peter Rosenkranz, Asian Development Bank



#### OLIVIER DE BANDT

Director of Research at the Prudential Supervision Authority  
Banque de France

Olivier de Bandt is also an Associate Professor at University of Paris Ouest Nanterre La Défense. His previous positions include senior economist at the European Monetary Institute and European Central Bank; head of Forecasting Division at Banque de France; Deputy Director, Directorate Macroeconomic Analysis and Forecasting; and Director of Business Conditions and Macroeconomic Forecasting. His research interests are economics of banking and insurance, stress tests, macroeconomics, international economics, and forecasting methods.

The first paper of this session discussed the effects of post-crisis financial regulation using a DSGE framework. Following the global financial crisis and the significant change in the regulatory framework for banks, the issue of the effects on banks and the macroeconomy has naturally been raised, as well as the overall consistency of the whole framework. Yet, no definite answer to this has been agreed on in the literature.

The new Basel III requirements triggered a first wave of studies to assess the overall impact of the new regulatory constraints on the real economy. However, they are primarily concentrated on the effect of the solvency ratio, without considering liquidity regulation. More recently, new DSGE models have been introduced, featuring a more developed banking sector. Also, liquidity constraints have been investigated. Empirical evidence has been put forward to assess the effects of country-specific experiences (such as the UK or the Netherlands). The general conclusion is that regulatory constraints have short-term negative effects on credit supply and GDP, usually of small magnitude and balanced by expected long-term gains in financial stability. However, there is less consensus about liquidity regulation.

To investigate these open questions, the authors develop a large scale DSGE model calibrated using mainly eurozone data and which includes a real and a financial sector dominated by a universal banking system. Banks grant long-term credit but also invest in corporate and sovereign bonds.



To better gauge the impact of the regulatory constraints on small and large firms, the model accounts for heterogeneity among producers. Compared with previous papers, this model allows for a very detailed assessment of the regulation, as it includes both capital and liquidity regulation (liquidity coverage ratio and net stable funding ratio [NSFR]) in a way close to the Basel III complex definition. Thus, the model incorporates many relevant features of the European banking sector, notably the rise of alternative sources of finance for nonfinancial corporations.

An additional novelty of the paper is to introduce a multi-period asset and liability framework, which allows more adequate modelling of the actual regulation, notably regarding the NSFR. Although calibrated to the eurozone, the channels of transmission of regulatory shocks highlighted here are also relevant for large Asian countries.

The main findings of the paper are that (i) the implementation of liquidity regulation which affects private consumption dynamics has a less persistent effect than solvency regulation that affects loan distribution as well as investment, (ii) the model assesses to what extent the liquidity coverage ratio may induce banks to substitute sovereign bonds to business loans, (iii) liquidity and solvency regulations appear to be complementary, and (iv) the implementation of the liquidity coverage ratio has qualitatively similar results as the NSFR, even if, quantitatively, the latter has a more moderate effect.

While highlighting the importance of the main results of the paper, the discussion focused on issues related to the model calibration, validation, and policy implications of the study.

## FINANCIAL SECTOR ORIGINS OF ECONOMIC GROWTH DELUSION

Frederic Malherbe, London Business School

Michael McMahon, University of Warwick (presenter)

Discussant: Antonio Fatas, INSEAD



### MICHAEL MCMAHON

Associate Professor of Economics  
University of Warwick

Michael McMahon previously taught at Stanford University, INSEAD, New York University, London Business School, Chicago GSB, and the London School of Economics. He has worked for the Bank of England as a euro-area economist, with spells at the European Central Bank and the Central Bank of Ireland. He has also worked as a consultant to the International Monetary Fund. His research interests include the macroeconomics of business cycles, monetary economics, inventories and applied econometrics.

Acknowledging that GDP is typically persistently weaker than pre-crisis trends, the second paper investigates whether economic growth delusion has its origins in the financial sector. The authors build a simple competitive general equilibrium model to highlight the role that the financial sector may have in boosting GDP to unsustainable, undesirable levels before financial crises. The research focuses on the role of ex-ante incentives in the financial sector, and shows that implicit subsidies from the government to the financial sector can have strong effects on real economic activity.

In particular, the economy is characterized by overinvestment driven by banks' focus on outcomes in good times, knowing that depositors will be compensated if the bank suffers losses in bad times. The overinvestment raises productivity of labor which boosts real wages. Overall, GDP is boosted above efficient and sustainable levels. In addition, it is also shown that allowing banks to freely trade in financial securities exacerbates the problem.

This financial-sector-driven overinvestment boosts GDP. However, welfare is lower due to the inefficiency of the investment and the cost of the bailout when the bad state arises and banks fail. In fact, it shows that the net domestic product, well-known to be a better measure of welfare than GDP, will actually fall despite the rise in GDP.

The analysis suggests that economists that forecast growth on the basis of time-series trends could become deluded by the persistently higher GDP. This could lead to them thinking that the inefficient boost to GDP that derives from an increased ability by the financial sector to exploit such a mechanism is sustainable potential output capacity. After a financial crisis, they may expect to return quickly to the pre-crisis trend; in reality, the pre-crisis trend in GDP may have been neither sustainable nor desirable.

Empirically, the model's predictions are consistent with many stylized facts associated with the US economy in the run up to the 2008 crisis. There was a marked increase in the capital-stock-to-GDP ratio, an acceleration of real wages, and a rise of banks' trading activities. There was an increase in the ratio of GDP to net domestic product consistent with a decline in welfare.



Lending standards and profit margins declined. Capital goods prices, especially those in fixed supply, increased.

While acknowledging that there is not just one thing driving the changes, a back-of-the-envelope calculation suggests a substantial role for this mechanism during that period. From that viewpoint, the great recession can look more like a reversing of a great distortion.

The discussion included remarks as to whether the model's predictions also hold in a more dynamic setting with growing productivity and the possible inclusion of open economy characteristics.

## PRUDENTIAL POLICIES AND THEIR IMPACT ON CREDIT IN THE UNITED STATES

Seung Jung Lee, Federal Reserve System

Paul Calem, Federal Reserve Bank of Philadelphia

Ricardo Correa, Federal Reserve Board (Presenter)

Discussant: Frederic Malherbe, London Business School



### RICARDO CORREA

Chief, International Financial Stability Section  
Board of Governors of the Federal Reserve System

Ricardo Correa's research interests are financial stability and international banking. Previous positions held at the Board of Governors of the Federal Reserve System include Principal Economist and Economist. He was also a researcher at Fedesarrollo.

The last paper presented at this conference provided an empirical assessment of the effects of prudential policies on credit in the US. The nascent interest in macroprudential instruments to limit the threat to financial stability has led to an assessment of the effectiveness of such tools. Most recent studies have focused on testing for the effect of these instruments on credit aggregates using cross-country information. This paper is located on the other side of the spectrum, that is, it uses micro-level data for one country, the US. The benefit of this approach is that it allows more precise determination of the impact of macroprudential tools on specific credit activities that may be of interest to policy makers.

The focus of the analysis was on two specific instruments recently used by US policy makers to enhance the resilience of financial institutions and to ensure that growth in balance sheet credit risk exposure is commensurate with capital accumulation. Supervisory guidance and stress tests have traditionally been used as microprudential tools to increase the safety and soundness of banks. However, some of their cyclical features may also effect credit aggregates, which would make them useful to "lean into the wind" during expansive credit market conditions.

The results show that stress tests only affect credit originations in the jumbo mortgage market if the assumptions on expected losses used in the scenario design are sufficiently stringent and if banks' capital buffers are not large. This finding is evidence that stress tests are only an effective cyclical tool when certain conditions are satisfied. Similarly, it is also found that supervisory guidance, in the case of leverage lending, is only effective in curtailing credit excesses if supervisors are sufficiently clear about the objective of the guidance.

These findings validate the link between prudential policies and credit supply in specific US market contexts. It complements existing cross-country studies

The implementation of liquidity regulation which affects private consumption dynamics has a less persistent effect than solvency regulation that affects loan distribution as well as investment.





that have provided confirmation of this relationship at a broad level. However, the exercise pertains to narrow market segments and only focuses on use of the instruments analyzed to achieve a credit tightening objective. To further study the effectiveness of macroprudential policies, more work is needed on the impact of instrument loosening on credit supply.

The discussion focused on two issues: the interpretation of results and their link to economic theory. On the effect of the stress test on jumbo mortgage lending, it was proposed that it would be useful to link the findings to the theory on the real impact of capital requirements. Some studies find that the impact of capital requirements on lending is ambiguous. The overall impact depends on the “debt overhang” in the system and the incentives of bankers for risk-shifting. A few tests proposed by the discussant could allow the authors to assess whether economic conditions at the time of the stress tests could influence their impact.





## Financial Regulations: Intermediation, Stability, and Productivity

### Conference Highlights

Co-organized by the Asian Development Bank, Asian Development Bank Institute, European Central Bank, Monetary Authority of Singapore, and National University of Singapore, the Asian Bureau of Finance and Economic Research Specialty Conference gathered leading academics, central bankers, financial regulators, and experts from international financial organizations and discussed theory, practices, and policy implications of financial regulations: intermediation, stability, and productivity.

### About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to a large share of the world's poor. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, including 48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

### About the Asian Bureau of Finance and Economic Research

The Asian Bureau of Finance and Economic Research is an institute founded by academics from Asia, North America, and Europe. The Bureau intends to create a virtual and independent network of high-quality academics akin to the NBER/CEPR, as well as conferences and workshops. The purposes of the Bureau include: (a) to promote Asia Pacific oriented financial and economic research at local, regional and international levels; (b) to connect globally prominent academic researchers, practitioners and public policy decision-makers on Asia Pacific related financial and economic issues; and (c) to enhance the research capabilities and development of strong clusters of finance and economic research groups in academic institutions and other institutions in Singapore and Asia Pacific.



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