



“The Workshop on Digital Currency Economics and Policy is jointly organised by the Asian Bureau of Finance and Economic Research (ABFER), the National University of Singapore (NUS) Business School and MAS. This Workshop, to be held in conjunction with the Singapore FinTech Festival 2018, aims to focus applied economic and financial research efforts on the implications of digital currencies for monetary policy and the financial system. It seeks to provide a platform for established academics in their mainstream areas of monetary and financial economics to apply their expertise to analysing the implications of digital currencies, and to encourage discussions on how the existing frameworks and paradigms of thinking about monetary and financial policies can be extended to incorporate this new technology-enabled development.”

Competition amongst monies has a long history. Private or foreign money, if trusted, can serve as a medium of exchange, store of value and unit of account, alongside or even displacing, government-issued monies. Recent technological advancement has lowered the barriers to entry for users to create private digital instruments that behave like currencies, often without any issuer. Many of these have market prices (which reflect the value that holders assign to them) and are accepted by some merchants as payment for goods and services. Correspondingly, multiple private monies, called digital currencies, have emerged. While their economic significance is still debatable, the phenomenon raises many important monetary policy and regulatory issues.

Digital monies can impact an economy, affect transaction arrangements and efficiency, and disrupt financial intermediation and related business models – especially in banking. They may modulate the relationship between traditional fiat money and price, savings and investment behaviour, and also expand avenues for illegal transactions. Competing with government fiat money, they exert pressures against seigniorage tax. They may also be a source of volatility and system fragility¹. Fundamentally, private digital currency providers are unlikely to internalise externalities inherent in disciplined money supply and prudent central banking policy objectives: this alone may be enough reason for government intervention.

Governments always have the option to digitalise their own currencies, and exercising this option may be necessary when private electronic monies become sufficiently pervasive. A government-managed digital currency can raise monetary policy flexibility (e.g., implementing negative interest rate) and possibly give the authorities more information about economic transactions and thus economy-wide aggregates too. Given modern-day computing and data technology, central banks could even directly take in deposits from savers and reduce dependence on private sector financial institutions (e.g. banks, insurance companies) to manage savings. The affected financial institutions may then become pure intermediaries: buying funds directly from central banks and lending them out to borrowers.

Yet, once the genie is out of the bottle, it cannot be put back easily. Few know, and fewer are prepared for, the mechanics and the economic implications of a government-managed digital currency.

Questions to be answered include: In what form would the central bank-issued digital currency take? Can private and public digital monies co-exist as fiat monies? What are the related regulatory issues? Policy makers also have to understand the parameters of consideration in deriving the optimal transition from a world of paper money, private money, and various quasi money instruments, to a world of digital government money. Furthermore, discussions are needed on how digitalisation of major currencies, including design choices that individual countries make, can impact the international monetary system as well as on the policy choice of other countries.

The Asian Bureau for Finance and Economic Research (ABFER), the Monetary Authority of Singapore (MAS) and the National University of Singapore (NUS) Business School are keen to raise the research efforts on these profound and very timely topics on

¹ Many Nobel Laureates have warned against trusting digital currencies like bitcoin, e.g., Joseph Stiglitz, Robert Shiller, Bengt Holmstrom, and Jean Tirole, who wrote in the Financial Times (29 November 2017) that there are many reasons to be cautious about bitcoin; investors must be protected, and regulated banks, insurance companies and pension funds should be prevented from building exposures to these instruments which have no intrinsic value.



digital currencies. Our first effort is to gather in-depth analyses of the effects of private and public digital currencies on the economy and financial system, and to discuss these in a Workshop. Academic researchers and thought leaders are invited to provide stimulating, accessible and informed analyses on the impact of this new development on a country's monetary arrangements, financial system, and on central bank policies as well as regulations. The areas of coverage include (a) implications of digitising the remaining components of money supply in the context of its basic functions and acceptance in a market-based economy, (b) possible changes to the price, credit, monetary and financial policy transmission channels, and (c) shifts in the structure of the financial system.

AGENDA

14 NOVEMBER 2018, WEDNESDAY

Singapore EXPO Convention & Exhibition Centre
1 Expo Drive, Singapore 486150

Time	Session Details
3:30 pm – 6:00 pm	Visit to Singapore FinTech Festival

15 NOVEMBER 2018, THURSDAY

Monetary Authority of Singapore, Penthouse, Level 30
10 Shenton Way, MAS Building, Singapore 079117

Time	Session Details
9:15 am – 10:00 am	Registration
10:00 am – 10:05 am	Welcome Remarks by Mr Edward Robinson , Assistant Managing Director (Economic Policy) and Chief Economist, Monetary Authority of Singapore
10:05 am – 10:45 am	Opening Keynote <i>"From the Curse of Cash to the Burden of Digitalisation"</i> Professor Kenneth Rogoff , Thomas D. Cabot Professor of Public Policy, Professor of Economics, Harvard University
10:45 am – 11:00 am	Tea Break
11:00 am – 12:30 pm	Part I – Monetary Economics and Policy <i>"History and Prospects for Private Digital Currencies"</i> Professor Barry Eichengreen , George C. Pardee and Helen N. Pardee Professor of Economics and Political Science, University of California, Berkeley Commentator: Professor Randall Morck , Stephen A. Jarislowsky Distinguished Chair in Finance, University of Alberta Chair: Dr Taimur Baig , Managing Director and Chief Economist, DBS Bank
12:30 pm – 2:00 pm	Lunch & Networking
2:00 pm – 3:30 pm	<i>"Co-existence of Private Digital Currencies and Central Bank Currencies"</i> Professor Markus K. Brunnermeier , Edwards S. Sanford Professor of Economics and Director of the Bendheim Center for Finance, Princeton University



Time	Session Details
	<p>Commentator: Professor Danny Quah, Dean and Li Ka Shing Professor of Economics, Lee Kuan Yew School of Public Policy, National University of Singapore</p> <p>Chair: Professor Sumit Agarwal, Head of Finance Department and Low Tuck Kwong Distinguished Professor, National University of Singapore</p>
3:30 pm – 3:45 pm	Tea Break
3:45 pm – 5:15 pm	<p><i>“The Implications of Digital Currencies on Monetary Policy and the International Monetary System”</i></p> <p>Professor Charles Engel, Donald Hester Professor of Economics, University of Wisconsin-Madison</p> <p>Commentator: Professor Andrew Rose, B.T. Rocca Jr. Chair in International Business and Trade, Haas School of Business, University of California, Berkeley</p> <p>Chair: Professor Antonio Fatas, Portuguese Council Chaired Professor of European Studies and Professor of Economics, INSEAD</p>

16 NOVEMBER 2018, FRIDAY

Monetary Authority of Singapore, Penthouse, Level 30
10 Shenton Way, MAS Building, Singapore 079117

Time	Session Details
8:30 am – 9:15 am	Registration
9:15 am – 10:45 am	<p>Part II – Financial System and Stability <i>“The Structure of Digital Fiat Currencies”</i></p> <p>Mr Robleh Ali, Research Scientist, Digital Currency Initiative, MIT Media Lab</p> <p>Commentator: Dr Prateek Saxena, Dean’s Chair Assistant Professor at School of Computing, National University of Singapore</p> <p>Chair: Professor Joseph Cherian, Director of Centre for Asset Management Research & Investments (CAMRI) and Professor of Finance, National University of Singapore</p>
10:45 am – 11:00 am	Tea Break
11:00 am – 12:30 pm	<p><i>“How would Private Digital Currencies affect Government Policy?”</i></p> <p>Professor David Yermack, Albert Fingerhut Professor of Finance and Business Transformation, Chairman of the Finance Department at New York University Stern School of Business, Adjunct Professor of Law at the NYU School of Law and Director of the NYU Pollack Center for Law and Business, New York University</p> <p>Co-authors: Dr Max Raskin, Research Fellow, Institute for Judicial Administration, New York University School of Law Professor Fahad Saleh, Assistant Professor of Finance, McGill University</p> <p>Commentator: Professor Gur Huberman, Robert G. Kirby Professor of Behavioural Finance, Business School, Columbia University</p>



Time	Session Details
	Chair: Professor Lim Kian Guan , Vice Provost on Undergraduate Matters, OUB Chair Professor of Finance Singapore Management University
12:30 pm – 2:30 pm	Lunch & Central Bankers' Panel
	<i>"The Practitioner's Perspective"</i> Dr Agustín Carstens , General Manager, Bank for International Settlements Ms Cecilia Skingsley , Deputy Governor, Sveriges Riksbank Moderator: Mr Ravi Menon , Managing Director, Monetary Authority of Singapore
2:30 pm – 2:45 pm	Break
2:45 pm – 4:15 pm	<i>"Digital Tokens and Financial Regulation"</i> Professor Franklin Allen , Professor of Finance and Economics, Executive Director, Brevan Howard Centre, Imperial College London Commentator: Professor Beatrice Weder di Mauro , President of CEPR; Research Professor of INSEAD and Distinguished Fellow-in-residence, Emerging Markets Institute of INSEAD Chair: Professor Bernard Yeung , Dean and Stephen Riady Distinguished Professor in Finance and Strategic Management, National University of Singapore
4:15 pm – 4:30 pm	Closing Remarks by Professor Bernard Yeung
4:30 pm	Adjourn



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CHRONOLOGICAL LIST OF SPEAKERS



EDWARD ROBINSON

Assistant Managing Director (Economic Policy) & Chief Economist, Monetary Authority of Singapore

Edward Robinson is the Assistant Managing Director of the Economic Policy Group, which is responsible for the formulation of Singapore's monetary policy. He has been with the MAS since 1992 and has been involved in macroeconomic modeling and is responsible for heading a team engaged in the continuing developmental work for the suite of MAS models, which are used for policy analysis. He has also been involved in other areas of economic policy work including in various inter-agency work groups which looked at the structural challenges facing the Singapore economy. He served on the Board of the Singapore Competition Commission between 2005 and 2007. He studied economics and applied econometrics at Monash University and the University of Melbourne.



KENNETH ROGOFF

Thomas D. Cabot Professor of Public Policy and Professor of Economics, Harvard University

Kenneth Rogoff is Thomas D. Cabot Professor at Harvard University. From 2001–2003, Rogoff served as Chief Economist at the International Monetary Fund. His widely-cited 2009 book with Carmen Reinhart, *This Time Is Different: Eight Centuries of Financial Folly*, shows the remarkable quantitative similarities across time and countries in the run-up and the aftermath of severe financial crises. Rogoff is also known for his seminal work on exchange rates and on central bank independence. Together with Maurice Obstfeld, he is co-author of *Foundations of International Macroeconomics*, a treatise that has also become a widely-used graduate text in the field worldwide. Rogoff's 2016 book *The Curse of Cash* looks at the past, present and future of currency from standardized coinage to crypto-currencies and central bank digital currencies. The book argues that although much of modern macroeconomics abstracts from the nature of currency, it is in fact lies at the heart of some of the most fundamental problems in monetary policy and public finance. His monthly syndicated column on global economic issues is published in over 50 countries. Rogoff is an elected member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the Group of Thirty, and He is a senior fellow at the Council on Foreign Relations. Rogoff is among the top ten on RePEc's ranking of economists by scholarly citations. He is also an international grandmaster of chess.



BARRY EICHENGREEN

George C. Pardee and Helen N. Pardee Professor of Economics and Political Science, University of California, Berkeley

Barry Eichengreen is the George C. Pardee and Helen N. Pardee Professor of Economics and Professor of Political Science at the University of California, Berkeley, where he has taught since 1987. He is a Research Associate of the National Bureau of Economic Research (Cambridge, Massachusetts) and Research Fellow of the Centre for Economic Policy Research (London, England). In 1997-98 he was Senior Policy Advisor at the International Monetary Fund. He is a fellow of the American Academy of Arts and Sciences (class of 1997). Professor Eichengreen is the convener of the Bellagio Group of academics and economic officials. He has held Guggenheim and Fulbright Fellowships and has been a fellow of the Center for Advanced Study in the Behavioral Sciences (Palo Alto) and the Institute for Advanced Study (Berlin). He is a regular monthly columnist for Project Syndicate. His most recent books are *The Populist Temptation: Economic Grievance and Political Reaction in the Modern Era* (Oxford University Press, 2018), *How Global Currencies Work: Past, Present, and Future* with Livia Chitu and Arnaud Mehl (November 2017), *The Korean Economy: From a Miraculous Past to a Sustainable Future* with Wonhyuk Lim, Yung Chul Park and Dwight H. Perkins (March 2015), *Renminbi Internationalization: Achievements, Prospects, and Challenges*, with Masahiro Kawai (February 2015), *Hall of Mirrors: The Great Depression, The Great Recession, and the Uses--and Misuses--of History* (January 2015), *From Miracle to Maturity: The Growth of the Korean Economy* with Dwight H. Perkins and Kwanho Shin (2012) and *Exorbitant Privilege: The Rise and Fall of the Dollar and the Future of the International Monetary System* (2011) (shortlisted for the Financial Times and Goldman Sachs Business Book of the Year Award in 2011). Professor Eichengreen was awarded the Economic History Association's Jonathan R.T. Hughes Prize for Excellence in Teaching in 2002 and the University of California at Berkeley Social Science Division's Distinguished Teaching Award in 2004. He is the recipient of a doctor honoris causa from the American University in Paris, and the 2010 recipient of the Schumpeter Prize from the International Schumpeter Society. He was named one of Foreign Policy Magazine's 100 Leading Global Thinkers in 2011. He is a past president of the Economic History Association (2010-11 academic year).

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RANDALL MORCK

Stephen A. Jarislowsky Distinguished Chair in Finance, University of Alberta

Randall Morck holds the Stephen A. Jarislowsky Distinguished Chair in Finance and a Distinguished University Professorship at the University of Alberta's Alberta School of Business. He earned an honors B.Sc. summa cum laude in applied mathematics and economics at Yale and a Ph.D. in economics at Harvard. He returns periodically to both almae matres – most recently as William Lyon Mackenzie King Visiting Professor at Harvard in 2005 and as Schoen Visiting Professor of Finance at Yale in 2009. Prof. Morck is a Senior Fellow and Vice President of the Asian Bureau of Financial and Economics Research, Research Associate with the National Bureau of Economic Research, Research Associate with the European Corporate Governance Institute, Senior Research Associate in Harvard Law School's Labor and Worklife Program, and Inaugural Fellow with the International Corporate Governance Society. Google Scholar records almost 36,000 citations to his over 100 research articles, and the Social Sciences Research Network ranks him the 54th most highly cited of 8,000 economics author worldwide. His articles appear in leading research journals including the American Economic Review, Journal of Finance, Review of Financial Studies, and Journal of Financial Economics, in which two won "citations all-star award". In recent years he has spoken at Brown, Cambridge, Colombia, Cornell, Dartmouth, Harvard, HEC, LSE, MIT, New York University, Princeton, Stanford, the University of California at Berkeley, Yale, and other leading research universities. He is a frequent speaker at conferences in North America and abroad and has advised a number of governments as well as the IMF and World Bank.



TAIMUR BAIG

Managing Director and Chief Economist, DBS Bank

Taimur Baig heads economics as well as macro strategy for interest rate, credit, currency, and equities at DBS Group Research. Prior to joining DBS, Taimur was a Principal Economist at the Monetary Authority of Singapore. Earlier he spent nine years at Deutsche Bank's Singapore office, where he was Chief Economist, Asia. Before Deutsche, Taimur was based in Washington DC, at the International Monetary Fund, for eight years, where his last position was Senior Economist.



MARKUS K. BRUNNERMEIER

Edwards S. Sanford Professor of Economics and Director of the Bendheim Center for Finance, Princeton University

Markus K. Brunnermeier is the Edwards S. Sanford Professor at Princeton University. He is a faculty member of the Department of Economics and director of Princeton's Bendheim Center for Finance. He is also a research associate at NBER, CEPR, and CESifo and a member of the Bellagio Group on the International Economy. He is a Sloan Research Fellow, Fellow of the Econometric Society, Guggenheim Fellow and the recipient of the Bernácer Prize granted for outstanding contributions in the fields of macroeconomics and finance. He is/was a member of several advisory groups, including to the IMF, the Federal Reserve of New York, the European Systemic Risk Board, the Bundesbank and the U.S. Congressional Budget Office. Brunnermeier was awarded his Ph.D. by the London School of Economics (LSE). His research focuses on international financial markets and the macroeconomy with special emphasis on bubbles, liquidity, financial and monetary price stability. To explore these topics, his models incorporate frictions as well as behavioral elements. He has been awarded several best paper prizes and served on the editorial boards of several leading economics and finance journals. He has tried to establish the concepts: liquidity spirals, CoVaR as co-risk measure, the Volatility Paradox, Paradox of Prudence, ESBies, financial dominance and the redistributive monetary policy. His recent book is titled "The Euro and the Battle of Ideas".



DANNY QUAH

Dean and Li Ka Shing Professor of Economics, Lee Kuan Yew School of Public Policy, National University of Singapore

Danny Quah is Dean and Li Ka Shing Professor in Economics at the School. His research interests include income inequality, economic growth, and international economic relations. Quah's current research takes an economic approach to world order - with focus on global power shift and the rise of the east and alternative models of global power relations. Quah is Commissioner on the Spence-Stiglitz Commission on Global Economic Transformation; Member, Executive Committee, International Economic Association; and Senior Fellow, Asian Bureau of Finance and Economics Research. Quah gave the third LSE-NUS lecture in 2013, TEDx talks in 2016, 2014, and 2012, and the



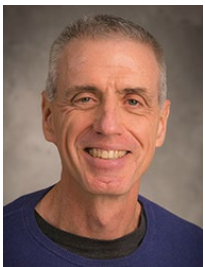
Inaugural LSE Big Questions Lecture in 2011. His blog is regularly named one of the top 100 Economics blogs in the world (2016, 2017a, 2017b) Quah's research has been supported by the Khazanah Research Institute, the John D. and Catherine T. MacArthur Foundation, the British Academy, the UK's Economic and Research Council, and the Andrew Mellon Foundation. Quah was previously Assistant Professor of Economics at MIT, and then Professor of Economics and International Development, and Director of the Saw Swee Hock Southeast Asia Centre at LSE. He served as LSE's Head of Department for Economics, and Council Member on Malaysia's National Economic Advisory Council. Quah studied at Princeton, Minnesota, and Harvard.



SUMIT AGARWAL

Head of Finance Department and Low Tuck Kwong Distinguished Professor, National University of Singapore

Sumit Agarwal is the Low Tuck Kwong Professor at the School of Business and Professor in the departments of Economics, Finance and Real Estate at the National University of Singapore. Previously, he held positions as a Professor of Finance at Georgetown University, senior financial economist in the research department at the Federal Reserve Bank of Chicago and a senior vice president and credit risk management executive in the Small Business Risk Solutions Group of Bank of America. Dr. Agarwal's research interests include issues relating to financial institutions, household finance, behavioral finance, international finance, real estate markets, urban economics and capital markets. He has published over eighty research articles in journals like the American Economic Review, Quarterly Journal of Economics, Journal of Political Economy, Journal of Finance, Journal of Financial Economics, Review of Financial Studies, Management Science, Journal of Financial Intermediation, Journal of Money, Credit, and Banking among others. Additionally, he has co-written a book titled Kiasunomics and co-edited a collected volume on Household Credit Usage: Personal Debt and Mortgages. He is the co-editor of Real Estate Economics and an association editor at Management Science and Journal of Financial Services Research. He writes regular op-ed's in the Straits Times and Forbes and is featured on various media outlets like the BBC, CNBC, and Fox on issues relating to finance, banking, and real estate markets. Sumit's research is widely cited in leading newspapers and magazines like the Wall Street Journal, The New York Times, The Economist, and the U.S Presidents Report to Congress. He also runs a blog on household financial decision making called Smart Finance. Dr. Agarwal has won various prestigious awards like the Distinguished Alumni Achievement Award at the University of Wisconsin – Milwaukee, Outstanding Researcher Award at the National University of Singapore, the Paul Samuelson TIAA-CREF certificate of excellence, the Terker Family Prizes in Investment Research Award from the Wharton School of Business, the Glucksman Institute Research Award from New York University and grants from the Russell Sage Foundation and the NBER/Sloan Foundation. Dr. Agarwal has been invited to present his research at many renowned universities such as Columbia University, Northwestern University, University of California Berkeley, Johns Hopkins, Wisconsin, Minnesota, Maryland, as well as institutions and central banks namely the IMF, World Bank, European Central Bank, European Union, Dutch Central Bank, Riksbank, OCC, and the Federal Reserve Banks of Chicago, San Francisco, Atlanta, Boston, New York, and Philadelphia. He has consulted with the World Bank, Federal Deposit Insurance Corporation, OCC, the Reserve Bank of India and Bank of America. He has also served as an adjunct professor and a scholar at the finance department at George Washington University, DePaul University, the Indian School of Business, HKUST, BIS and the World Bank. Agarwal received a Ph.D. in economics from the University of Wisconsin-Milwaukee.



CHARLES ENGEL

Donald Hester Professor of Economics, University of Wisconsin-Madison

Charles Engel is the Donald Hester Professor of Economics at the University of Wisconsin – Madison, which he joined in 2000. He has previously held positions at the University of Washington and the University of Virginia. He earned his Ph.D. from University of California, Berkeley, and his B.A. from University of North Carolina – Chapel Hill. He is a Research Associate for the National Bureau of Economic Research; a Research Affiliate at the Research Centre for International Economics, City University of Hong Kong; a member of the Advisory Board, Center for Applied Macroeconomic Analysis (Australia and New Zealand); an International Research Fellow, Kiel Institute, Kiel, Germany; on the Council of Advisers, Hong Kong Institute for Monetary Research; a member of the CESifo Research Network; serves on the BIS Advisory Panel and is a consultant at the Federal Reserve Bank of Chicago. He was Editor from 2001-2017 of the Journal of International Economics, the leading academic journal in the field of international economics. He has frequently been a Visiting Scholar at the Federal Reserve Board, the International Monetary Fund, the European Central Bank, the Bank for International Settlements, and central banks in several countries including England, France, the Netherlands, Hong Kong, Singapore, Serbia, Uruguay, and Chile. He is regularly a Visiting Scholar at several of the regional Federal Reserve Banks. He has published articles in the American Economic Review, the Journal of Political Economy, the Review of Economic Studies, the Journal of Monetary Economics, the Journal of International Economics and other publications.

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ANDREW K. ROSE

*B.T. Rocca Jr. Professor of International Business, Haas School of Business, University of California, Berkeley
Exco Member & Senior Fellow, Asian Bureau of Finance and Economic Research (ABFER)*

Andrew K. Rose is the B.T. Rocca Jr. Professor of International Business in the Economic Analysis and Policy Group, Haas School of Business at the University of California, Berkeley. He is also a Research Associate of the National Bureau of Economic Research (based in Cambridge, MA), a Research Fellow of the Centre for Economic Policy Research (based in London, England), and a Senior Fellow of the Asian Bureau of Finance and Economic Research (based in Singapore). He received his Ph.D. from the Massachusetts Institute of Technology, his M.Phil. from Nuffield College, University of Oxford, and his B.A. from Trinity College, University of Toronto. Rose has published over one hundred and fifty papers and over ninety articles in refereed economics journals, including the American Economic Review, the Quarterly Journal of Economics, the Review of Economic Studies, and the Journal of Finance. His research addresses issues in international trade, finance, and macroeconomics, and has received more than 40,000 citations. His teaching is in the areas of international macroeconomics; he has won two teaching awards. Rose served as Associate Dean for Academic Affairs and Chair of the Faculty 2010-2016, and was the managing editor of The Journal of International Economics 1995-2001. He was the founding director of the Clausen Center for International Business and Policy at Haas and the Risk Management Institute at the National University of Singapore. He has organized over fifty academic conferences. Rose is interested in the theory and practice of economic policy, and most of his work is applied and driven by "real world" international phenomena. A citizen of three countries, he has worked on six continents and at a number of international economic agencies, including: the International Monetary Fund, the World Bank, and the Asian Development Bank. He has also worked at a number of national agencies, including: the US Department of Treasury, HM Treasury (UK), the Canadian Department of Finance; and the central banks of: Australia, Canada, England, Europe, Hong Kong, Israel, Italy, Japan, Netherlands, New Zealand, Singapore, Spain, and the United States. He has visited a number of other universities, including Cape Town, EU, FUB, INSEAD, London School of Economics, Melbourne, NUS, Princeton, SHUFE, SMU, Stockholm, Tel Aviv, Tsinghua, ULB, and Victoria.



ANTONIO FATAS

Professor of Economics and The Portuguese Council Chaired Professor of European Studies, INSEAD

Antonio Fatás is a Professor of Economics at INSEAD. He received his PhD in Economics from Harvard University. He is a Research Fellow at the Centre for Economic and Policy Research in London and has worked as an external consultant for international organisations such as the International Monetary Fund, the OECD and the World Bank. He teaches the macroeconomics core course in the MBA programme, as well as different modules on the global macroeconomic environment in the Executive Education. His research focuses on the study of business cycles, fiscal policy and the economics of European integration. His articles appear in academic journals such as the Quarterly Journal of Economics, Journal of Monetary Economics, Journal of Money, Credit and Banking, Journal of Public Economics, Journal of International Economics, Journal of Economic Growth, European Economic Review and Economic Policy.



ROBLEH ALI

Research Scientist, Digital Currency Initiative, MIT Media Lab

Robleh Ali is a research scientist at the MIT Media Lab's Digital Currency Initiative. His main focus is on how national currencies can be issued digitally outside the existing banking system and the role of central banks in such a system. The overall aim of the work is fundamentally reforming the financial system by changing the way money is issued. He previously led the research into central bank issued digital currency at the Bank of England.

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PRATEEK SAXENA

Dean's Chair Assistant Professor at School of Computing, National University of Singapore

Prateek Saxena is the Dean's Chair Assistant Professor at School of Computing. He oversees the efforts of a 15-person security research lab at NUS focused on computer security. Prateek's recent research interests lie in blockchains, hardware-rooted security, secure languages and formal methods. He has authored over 50 papers in computer security and programming languages. Prateek has co-founded Anquan Capital and Zilliqa Research, two highly valued startups from NUS based on his research on blockchains. He advises companies such as Kyber Network and Dexecure which are spin-offs from his NUS research lab. Prateek's prior work led to the design of the Google Chrome Add-on platforms, script injection defenses deployed in the Google Closure Compiler framework, Dropbox's web sandboxing infrastructure and at Microsoft Research. Prateek completed his PhD at the University of California at Berkeley prior to joining NUS. He has received the MIT TR35 Top 10 Innovators in Asia Under 35 (2017), the Young Research Award at NUS (2017), the Sakrison Memorial Award for outstanding dissertation work at Berkeley (2012), the AT&T Best Applied Security Paper Award (2010), and several other best paper awards. He serves on the technical program committees of prestigious academic conferences such as IEEE S&P and Usenix Security.



JOSEPH CHERIAN

Director of Centre for Asset Management Research & Investments (CAMRI) and Professor of Finance, National University of Singapore

Joseph Cherian was formerly an Executive-in-Residence at Cornell University's Johnson Graduate School of Management (2008 – 2009), where he remains an Emeritus member of the Johnson Dean's Advisory Council after serving two terms (2009 – 2017). Prior to that, Joe was Managing Director, Global Head, and CIO of the Quantitative Strategies Group within Credit Suisse Alternative Investments in New York, where he had direct responsibility for over US\$67 billion in client assets managed to a quantitative discipline. While at Credit Suisse, Joe also served on the Global Executive Committee and various senior management, investments, and risk committees of the Asset Management division. Joe joined Credit Suisse in 2004 from Banc of America Capital Management, also in New York, where he was Managing Director and Senior Portfolio Manager of their asset allocation funds. Previously, he was an Associate Professor of Finance at Boston University. He has authored numerous articles for financial journals, and serves on the Scientific Advisory Board of Nipun Capital, a boutique hedge fund based in San Francisco. Joe has or had appointments at the Ministry of Manpower's CPF Advisory Panel, the Singapore International Mediation Centre's Panel of Technical Experts, the National Research Foundation's Early Stage Venture Fund Evaluation Panel, the SNEC/SERI Medical Director's Advisory Council in Singapore; the Melbourne Mercer Global Pension Index (MMGPI) Steering Committee in Australia; the United Nations Social Impact Fund (UNDP-UNSIF) Research Council and the Journal of Alternative Investments' Editorial Board in the US. He formerly served as a review board member of the Research Foundation of the CFA Institute, and on the Scientific Advisory Boards of net Decide Corp., a pioneering RoboAdvisory firm, Orissa Group, a pioneer in the development and dissemination of liquidity-based data and analytical products across multiple asset classes, and SKG Inc., all based in the US. Joe holds a B.S. in Electrical Engineering from MIT, and M.S. and Ph.D. degrees in Finance from Cornell University.



DAVID YERMACK

Albert Fingerhut Professor of Finance and Business Transformation, Chairman of the Finance Department at New York University Stern School of Business, Adjunct Professor of Law at the NYU School of Law, Director of the NYU Pollack Center for Law and Business, New York University

David Yermack is the Albert Fingerhut Professor of Finance and Business Transformation and Chairman of the Finance Department at New York University's Stern School of Business, where he has been a member of the faculty since 1994. He is also an Adjunct Professor of Law at the NYU School of Law, Director of the NYU Pollack Center for Law and Business, and a Research Associate of the NBER Law and Economics program. In 2014 Prof. Yermack began teaching a full semester course at NYU on Digital Currency and Blockchains with his Law School colleague Prof. Geoffrey Miller. The course was the first in the world on this topic taught at a major research university, and it now draws more than 200 students annually. NYU Stern launched a FinTech MBA specialization in 2016, and this program will offer more than 12 FinTech courses in an interdisciplinary joint venture between its Finance and Information Systems departments this year. In addition to his recent research on blockchains and digital currencies, Professor Yermack has published some of the most cited papers in the fields of executive compensation and corporate governance. He has also written papers on such diverse topics as options in baseball player contracts, incentive compensation for clergymen, tobacco litigation, fraudulent charitable contributions, CEOs' mansions, and the fashion industry. Professor Yermack was awarded AB (1995), MBA (1991), JD (1991), AM (1993) and PhD (1994) degrees, all from Harvard University. He has been appointed as a visiting professor at 12 international universities, a



visiting scholar at the Federal Reserve Banks of New York and Philadelphia, and has given invited research seminars at more than 100 universities and institutes worldwide.



GUR HUBERMAN

Robert G. Kirby Professor of Behavioral Finance at Columbia University

Gur Huberman is the Robert G. Kirby Professor of Behavioral Finance at Columbia Business School where he has taught since 1989. Prior to that, he taught at Tel Aviv University and at the University of Chicago. Between 1993 and 1995 he was Vice President at JP Morgan Investment Management responsible for research on quantitative equity trading. In that capacity he also helped develop tax aware strategies for the private bank. He earned his PhD (with distinction) in operations research from Yale in 1980 and his B.Sc. (cum laude) in mathematics from Tel Aviv University in 1975. Professor Huberman's published work is widely read and cited; and covers a broad range in finance and economics. He contributed to the theory of equilibrium return-risk tradeoff, to the theory of contracts, to the study of individual's portfolio selection, especially in the context of retirement savings to the theory of liquidity and trading, and to Behavior Finance. More recently he has turned his attention to FinTech and cryptocurrencies and has co-authored "Monopoly Without a Monopolist: An Economic Analysis of the Bitcoin Payment System." Professor Huberman was a founding managing editor of the International Journal of Theoretical and Applied Finance. His co-authored paper won the 2006 Journal of Finance Distinguished Paper award of the Smith-Breeden Prize. He was a member of the Academic Advisory Board of Morgan Stanley Equity Market Microstructure Research.



LIM KIAN GUAN

Vice Provost on Undergraduate Matters, OUB Chair Professor of Finance, Singapore Management University

Professor Lim Kian Guan is the Vice Provost on Undergraduate Matters and the OUB Chair Professor of Finance in Singapore Management University (SMU). Graduated with a PhD in Financial Economics from Stanford University, Professor Lim has worked in universities for over 30 years after an initial posting with the Singapore Administrative Service. He teaches and researches in the areas of quantitative finance, financial economics, and applied probability and statistics. He has consulted for banks and companies in the area of risk management and project valuation. He has also been actively involved in various aspects of university business including being Interim Dean of Business School, Associate Dean, Vice-Dean, Sub-Dean, Head of Department, Journal Editor, Director of University level Research Centre, Directors of Degree Programs, Faculty Senate Chair, Chair of University Task Force, Organizer of International Conferences, Professional Society President, Advisory Board Member, External Academic Advisor of international associations and schools, and others. He has also taught in various financial executive development courses at NUS, SMU, IBF, MIS, and others. He publishes in international refereed journals such as Quantitative Finance, International Journal of Theoretical and Applied Finance, Journal of Futures Markets, Journal of Risk, Journal of Banking and Finance, ASTIN Bulletin, Journal of Financial Economics, Journal of Financial and Quantitative Analysis, Finance and Stochastics, Review of Economics and Statistics, Journal of Real Estate Finance and Economics, European Journal of Operations Research, Journal of Portfolio Management, Financial Analyst Journal, Decision Sciences, and many others. He has also written two books on "Financial Valuation and Econometrics" and "Probability and Finance Theory" in their second editions published by World Scientific Press. He was awarded the Singapore Public Administration Medal (Silver) in 2012.



AGUSTÍN CARSTENS

General Manager, Bank for International Settlements

Agustín Carstens became General Manager of the BIS on 1 December 2017. Mr Carstens was Governor of the Bank of Mexico from 2010 to 2017. A member of the BIS Board from 2011 to 2017, he was chair of the Global Economy Meeting and the Economic Consultative Council from 2013 until 2017. He also chaired the International Monetary and Financial Committee, the IMF's policy advisory committee from 2015 to 2017. Mr Carstens began his career in 1980 at the Bank of Mexico. From 1999 to 2000, he was Executive Director at the IMF. He later served as Mexico's deputy finance minister (2000-03) and as Deputy Managing Director at the IMF (2003-06). He was Mexico's finance minister from 2006 to 2009. Mr Carstens has been a member of the Financial Stability Board since 2010 and is a member of the Group of Thirty. Mr Carstens holds an MA and a PhD in economics from the University of Chicago.

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CECILIA SKINGSLEY

Deputy Governor, Sveriges Riksbank

Cecilia Skingsley took up the post of Deputy Governor of the Swedish Riksbank in May 2013 with a term of office of six years. She represents the Riksbank on the Committee on the Global Financial System (CGFS) and on the Euro Retail Payments Board (ERPB). She is also the Governor of the Riksbank's alternative on the Board of Directors of the BIS and chairs the retail payments council. In October 2016, Ms Skingsley was appointed to co-chair the World Economic Forum's working group Global Future Council on the Future of Financial and Monetary Systems. Ms Skingsley has a BSc in economics and a financial analyst diploma. She was previously chief economist at Swedbank and has also worked at Dagens Industri, ABN Amro Bank and the Ministry of Finance.



RAVI MENON

Managing Director, Monetary Authority of Singapore

Ravi Menon has been Managing Director of the Monetary Authority of Singapore (MAS) since 2011. The MAS conducts monetary policy, manages the official foreign reserves, supervises the financial sector, and develops Singapore as a financial centre. On the international front, Mr Menon is a member of the Financial Stability Board (FSB) Steering Committee. He chaired the FSB Standing Committee on Standards Implementation during 2013-2017, the International Monetary and Financial Committee (IMFC) Deputies Meetings during 2011-2015, and the APEC Senior Officials Meetings in 2009. Mr Menon was Permanent Secretary at the Ministry of Trade & Industry (2007-2011), where he led the ministry's work in economic strategy; energy policy; research and development; and international trade. Mr Menon was Deputy Secretary at the Ministry of Finance (2003-2007), where he was responsible for fiscal policy and government reserves. Mr Menon began his career at MAS in 1987. During his 16 years in MAS, he was involved in monetary policy; econometric forecasting; banking regulation and liberalisation; and integrated supervision of complex financial institutions. A recipient of the Public Administration Medal (Gold), Mr Menon has served on boards in the public, private, and people sectors. He was Chairman of the Singapore Co-operation Enterprise; Deputy Chairman of the Central Provident Fund Board; and a board member of the Housing and Development Board; Singapore Totalisator Board; Agency for Science, Technology, and Research; Civil Service College; and National Research Foundation. He was also on the board of directors of DBS Bank, the largest bank in Southeast Asia. Mr Menon is currently Chairman of the Institute of Banking and Finance, and he serves on the board of trustees of the Singapore Indian Development Association, a community volunteer group. Mr Menon holds a Master's in Public Administration from Harvard University and a Bachelor of Social Science (Honours) in Economics from the National University of Singapore. A two-time winner of the Prime Minister's Book Prize, Mr Menon was a prefect and scout leader at Raffles Institution where he had his secondary education.



FRANKLIN ALLEN

Professor of Finance and Economics, Executive Director, Brevan Howard Centre, Imperial College London

Franklin Allen is Professor of Finance and Economics and Director of the Brevan Howard Centre at Imperial College London and has held these positions since July 2014. He was on the faculty of the Wharton School of the University of Pennsylvania from July 1980 – June 2016. He now has Emeritus status there. He was formerly Vice Dean and Director of Wharton Doctoral Programs, Co-Director of the Wharton Financial Institutions Center, Executive Editor of the *Review of Financial Studies* and Managing Editor of the *Review of Finance*. He is a past President of the American Finance Association, the Western Finance Association, the Society for Financial Studies, the Financial Intermediation Research Society and the Financial Management Association, and a Fellow of the Econometric Society and the British Academy. He received his doctorate from Oxford University. Dr. Allen's main areas of interest are corporate finance, asset pricing, financial innovation, comparative financial systems, and financial crises. He is a co-author with Richard Brealey and Stewart Myers of the eighth through twelfth editions of the textbook *Principles of Corporate Finance*.



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BEATRICE WEDER DI MAURO

President of Centre for Economic Policy Research (CEPR), Distinguished Fellow-in-residence, Emerging Markets Institute of INSEAD and Professor of Economics, Chair of Economic Policy and International Macroeconomics, University of Mainz, Germany

Beatrice Weder di Mauro is a Fellow-in-residence at the INSEAD Emerging Markets Institute, Singapore. She serves as President of the Centre for Economic Policy Research (CEPR). From 2004 to 2012 she was a member on the German Council of Economic Experts. Previously she had worked at the University of Basel and the International Monetary Fund. She has held visiting positions at Harvard University, the National Bureau of Economic Research and the United Nations University in Tokyo. She has served as consultant to governments, international organizations and central banks (European Commission, International Monetary Fund, World Bank, European Central Bank, Deutsche Bundesbank, OECD, among others). She is presently independent director on the board of Bombardier, UBS and Bosch and research fellow at the Centre for Economic Policy Research (CEPR) in London, at the Asian Bureau of Finance and Economic Research (ABFER) in Singapore, a member of the ETH Foundation Council in Zurich, the Scientific Council of the Foundation Banque de France in Paris and of the Bellagio Group. Her research interests are in international macroeconomics. She has published widely in leading academic journals, including the *American Economic Review*, *Journal of International Economics*, *Brookings Papers on Economic Activity*, *Journal of Public Economics*, *Journal of Development Economics* and *Review of Finance*. She writes regular op-eds and contributions to the public policy debate.



BERNARD YEUNG

Dean and Stephen Riady Distinguished Professor in Finance and Strategic Management, National University of Singapore and President, Asian Bureau of Finance and Economic Research (ABFER)

Professor Bernard Yeung is the Dean and Stephen Riady Distinguished Professor in Finance and Strategic Management and President of the Asian Bureau of Finance and Economic Research at National University of Singapore (NUS) Business School. Before joining NUS in June 2008, he was the Abraham Krasnoff Professor in Global Business, Economics, and Management at New York University (NYU) Stern School of Business. He has also served as the Director of the NYU China House, the honorary co-chair of the Strategy Department of the Peking University Guanghua School of Management. From 1988 to 1999, he taught at the University of Michigan and at the University of Alberta from 1983 to 1988. Professor Yeung has published widely in academic journals covering topics in Finance, Economics, and Strategy; his writing also appears in top-tier media publications such as *The Financial Times*, *Economist*, and *The Wall Street Journal*. He received the Public Administration Medal (Silver), 2018, as part of the National Day Awards, in recognition for his contribution to public service in Singapore. He also won the Irwin Outstanding Educator Award (2013) from the Business Policy and Strategy (BPS) division of the Academy of Management, and is an elected Fellow of the Academy of International Business. Professor Yeung was a member of the Economic Strategies Committee in Singapore (2009), a member of the Financial Research Council of the Monetary Authority of Singapore (2010-2013), and is a member of the Social Science Research Council (SSRC) in Singapore (2016-2018). Professor Yeung is the President of Asian Bureau of Finance and Economic Research since 2014. He is also the Honorary Dean of the newly established Mapletree Training and Development Centre and the Business School of Global Commercial newspaper Union since 2017. Professor Yeung also serves as an independent Non-executive Director of the Bank of China (BOC) Aviation Limited since 2016. Professor Yeung sits on the 3rd Advisory Board of the Antai College of Economics and Management at Shanghai Jiao Tong University, the Advisory Council of the Economics and Management School of Wuhan University, and the Advisory Committee of the Institute of Economics, Academia Sinica. Professor Yeung received his Bachelor of Arts in Economics and Mathematics from the University of Western Ontario and his MBA and PhD degrees from the Graduate School of Business at the University of Chicago.

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