BENCHMARKING ISLAMIC FINANCE

A FRAMEWORK FOR EVALUATING FINANCIAL PRODUCTS AND SERVICES

Edited by
Mohd Ma'Sum Billah

BENCHMARKING ISLAMIC FINANCE

Pricing or benchmarking is a process of evaluating the performance of a financial company's products and services or systems, against other businesses, considered to be at the top of their field, by applying a measurement of "best in performance".

This book includes contributions from the leading global experts in the field who tackle topics such as whether the Islamic financial system has been dependent on the LIBOR/EURIBOR in its benchmarking exercises to date and, thus, whether it will be affected negatively by the predicted non-existence of the LIBOR/EURIBOR from 2021 onwards. They also address the question of whether the Islamic financial system requires benchmarking of its products and services and consider the emergence of Sharīʿah-justified benchmarking in today's Islamic financial system. Additionally, they look at how benchmarking formulas should be adapted to ensure the satisfaction of customers within the principles of Maqasid al-Sharīʿah.

It takes a legal and institutional approach to the subject, which readers will find particularly valuable, as there are various forms of Islamic finance institutions that do not conform to established models in the finance industry. Furthermore, there are emerging business models that will benefit from this line of investigation.

This book offers a timely analysis of these issues and redresses the existing misconceptions and misinterpretations pertaining to benchmarking in an Islamic finance context and, as such, provides guidance and strategies for future directions. It will appeal to researchers of Islamic banking, finance, and insurance, as well as practitioners, particularly standard-setting bodies, regulators, and policy makers.

Mohd Ma'Sum Billah is a Senior Professor of Finance at the Islamic Economics Institute, King Abdul Aziz University, Jeddah, Kingdom of Saudi Arabia.

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BENCHMARKING ISLAMIC FINANCE

A Framework for Evaluating Financial Products and Services

Edited by Mohd Ma'Sum Billah

THIS BOOK IS, DEDICATED TO THE REMEMBRANCE OF MY MOST BELOVED PARENTS *ALLAMAH MUFTI NUR MOHAMMAD (R)* AND *USTAZAH AKHTARUN NISA' (R)* WHO HAVE NOURISHED ME WITH THEIR LOVE AND WISDOM. MAY *ALLAH (SWT)* SHOWER THEM WITH HIS LOVE AND MERCY AND GRANT THEM *JANNAT AL-FERDAUS*. I WOULD ALSO LIKE TO DEDICATE THIS BOOK TO MY LOVELY WIFE DR KHAMSIAH BINTI NAWAWI (HEAD, OSHE-HOSPITAL UKM) AND OUR LOVING KIDS DR AHMAD MU'IZZ BILLAH (HCTM), AHMAD MU'AZZ BILLAH (OP-RMC CADET), AHMAD MUNIFF BILLAH (OP-RMC CADET) AND AKHTARUN NABA' BILLAH (ANSARA MRSM) FOR THEIR CONTINUOUS SUPPORTS AND SACRIFICES.

MAY ALL BE BLESSED WITH *MUWADDAU WA RAHMAH*, *QURRATU A'YUN* AND *MARDHAATI ALLAH (SWT)* IN THE LIFE AND THE NEXT.

THIS BOOK IS ALSO DEDICATED TO THE *UMMAH* AND THE WHOLE OF HUMANITY

MOHD MA'SUM BILLAH, PHD

ISLAMIC ECONOMICS INSTITUTE

KING ABDULAZIZ UNIVERSITY

SAUDI ARABIA

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ABOUT THE EDITOR

Mohd Ma'Sum Billah, DBA, PhD, MBA, MCL, MMB, LLB (hons), is Professor of finance, insurance, fintech and investment, Islamic Economics Institute, King Abdulaziz University, Kingdom of Saudi Arabia. Billah is also affiliated with University of South Australia as Adjunct-Professor. He is currently the Member of the Audit Board of ACIG (appointed by the Saudi Monetary Authority/Central Bank of Saudi Arabia), Saudi Arabia. Billah had been serving and contributing both academic as well as corporate industries and international organizations for more than 25 years with management, teaching, research, solution proving and sharing of strategic and technical know-how towards the advancement of Islamic finance, fintech, business, investment, capital market and insurance *(Takaful)* besides *Halal* standard. Billah has published 36 books and chapters in books besides more than 200 articles in internationally reputable journals and social media. Most of his books were published by world renowned publishers namely: Thompson Reuters, Sweet & Max Well, Palgrave Mac Millan, Springer, Routledge, Edward Elgar and others. Most of his books and articles are used as among the lead references (solutions to reality) by universities, industries, professional firms, governments, policy makers, regulators, NGOs, academia, researchers and students of higher learning in different parts of the contemporary world. He had been presenting in more than 300 conferences, seminars, executive workshops, professional development and industrial trainings in different parts of the world. In addition, he had also been affiliated with corporate, academic and financial industries including central banks, international corporate organizations, governments and NGOs in his capacity as a member in boards, director, advisor, strategic decision maker, transformer and reformer with strategic solutions and technical know-how. Among the areas of his interest and contributions are: Islamic finance, insurance *(takaful)*, crowd-funding, investment, *Zakat, Waqf*, capital market *(Sukuk)*, social finance, SDGs, petroleum finance, trade, fintech, e-Commerce, Crypto-asset, cryptocurrency, industrialization, privatization, national entrepreneuring models, standards, policies strategies and technical know-how.

CONTRIBUTORS

Mustapha Abubakar, PhD, is a Senior Lecturer in the Department of Banking and Finance at Ahmadu Bello University Business School, Zaria, Nigeria. Prior to joining the academic community, he worked as a banking officer at the Union Bank of Nigeria for nearly three years from 1996 to 1999. He obtained a Diploma in Accounting, BSc Business Administration, MBA, MSc Business Administration, and PhD, all from Ahmadu Bello University, Zaria, Nigeria in 1989, 1993, 1995, 2010, and 2017 respectively. He has participated in many academic conferences as a paper presenter in conventional and Islamic finance, banking, and economics in Nigeria, Malaysia, Saudi Arabia, and Bangladesh. He has also published papers in academic journals and books in Nigeria and abroad, and as a member of editorial advisory boards has reviewed a number of academic papers for seminars, theses, journal articles, and books in areas of Islamic banking, economics, and finance. This is in addition to other numerous supervisions of undergraduate and postgraduate students.

Irfan Syauqi Beik, PhD, is an associate professor at the Department of Islamic Economics, Bogor Agricultural University (IPB), Indonesia, and holds the position of the Director of the Centre of Islamic Business and Economic Studies (CIBEST) at IPB. Beside his role as an academician, Irfan has been the Director of the Centre of Strategic Studies at the National Zakat Board of the Republic of Indonesia (BAZNAS) since August 2016. He is also a member of the National Shari'ah Board of the Indonesian Council of Ulama (DSN-MUI) and the Deputy Chairman of the Indonesian Association of Islamic Economists (IAEI). Irfan is member of Shari'ah supervisory councils in several Islamic financial institutions. In addition, Irfan has published books and scientific articles at both national and international journals and has contributed regularly to various national newspapers in Indonesia.

Rusni Hassan, PhD, is a Professor at the IIUM Institute of Islamic Banking and Finance, IIUM. She graduated with LLB (Hon), LLB (Sharīʿah) (First Class), Master of Comparative Laws (MCL), and a PhD in Law. She is actively involved in various Islamic financial institutions with the Sharīʿah committee locally and internationally. She has spoken extensively at conferences,

workshops, and trainings on various Islamic Finance issues. A prolific writer and researcher in Islamic Finance, she has published books including *Islamic Banking and Takaful*, *Islamic Banking under Malaysian Law*, *Islamic Banking Cases and Commentaries*, *Corporate Governance of Islamic Financial Institutions*, *Remedies for Default in Islamic Banking*, and *Termination of Contractual Obligations in Islamic Finance*. She has published more than 100 articles in local and international journals. She has received awards for her contributions to Islamic finance, such as Top 10 Women in Islamic Finance (2013); Most Talented Women Professionals in Islamic Banking (2014); Women of Distinction in Islamic Finance and Law (2016); Distinguished Woman in Management (2017); 100 Influential Women in Islamic Finance (2017); Top 50 Most Influential Women in Islamic Finance (2018); and Top 10 Most Influential Women in Islamic Business and Finance (2019).

Suheyib Eldersevi, MSc, is presently an Associate Sharīʿah Auditor at Raqaba for Shari'ah Audit and Islamic Financial Advisory. He holds an MSc in Islamic Banking and Finance from IIUM Institute of Islamic Banking and Finance. Currently, he is a PhD candidate at the Department of Islamic Economics and Finance, Istanbul Sabahattin Zaim University.

Ruslan Sabirzyanov works at Abu Dhabi Islamic Bank (ADIB) in UAE. He holds a diverse educational background in Sharīʿah, Computer Science and Islamic finance from the leading universities in their respective countries. He is highly qualified Islamic finance professional with expertise in Sharīʿah compliance, review, structuring, and documentation. He has strong knowledge of Islamic banking processes as well as extensive experience of advising on a range of transactions across the globe. He has a strong academic focus in Sharīʿah and its application to commercial transactions. This is evidenced in several academic publications on the subject as well as membership in editorial boards and professional associations.

Laily Dwi Arsyianti, PhD, is an assistant professor at IPB University. She holds an *amanah* as Deputy Head of Department of Islamic Economics, Faculty of Economics and Management. She graduated from IPB with a bachelor's in economics (Hons), and from the International Islamic University of Malaysia for her Master of Science in Finance and a PhD in Islamic Banking and Finance. Her areas of interest include Islamic wealth management, Islamic social finance, and behavioral finance. She has published 32 papers in SCOPUS-indexed journals and national accredited journals. She has also presented selected papers at various reputable conferences, especially those that are organized by IRTI-IDB and Bank Indonesia.

Ahmed Abdullah, MA, is working towards a PhD in Islamic law and jurisprudence (Sharīʿah) at the International Islamic University, Islamabad. He has taught many courses related to Islamic studies at respected institutions in Pakistan. His aim is to play a role in the development, advancement, and

promotion of Islamic law and bring a sense of compatibility and conformity between international Islamic laws and contemporary international laws.

Ayman Mohammad Bakr, MBA, is presently a PhD student at the Department of Islamic Economics and Finance at Istanbul Sabahattin Zaim University. He holds two bachelor's degrees, one in electrical electronics engineering from Bilkent University and the other in mathematics from Southern New Hampshire University, from which he earned two outstanding academic achievements awards. Ayman earned his master's degree in business administration with distinction from Strathclyde University. He has several industrial experiences, with more than ten years in an international financial institution. He wrote several research papers and his interests are e-waste, circular economy, econometrics of FX rates and trade, waqf, and waqf worldview.

Isiaka Ahmed HALIDU, MSc, holds a postgraduate degree in Islamic Banking and Finance from the International Institute of Islamic Banking and Finance, Bayero University, Kano, Nigeria, and a BSc in Economics (Second Class Honors, Upper Division) from Ahmadu Bello University, Zaria, Nigeria. He currently works for JAIZ BANK Plc in Nigeria in its domestic operations department at the bank's head office.

Mohamed Benaicha, MSc, took his bachelor's degree in finance in Canada at the University of Toronto. He also holds a bachelor's in fiqh and usul al-fiqh and an MSc in Islamic banking and finance from IIUM in Malaysia. He has consistently ranked at the top of his classes and has received awards for academic achievement, such as the top student award at IIUM's 34th annual convocation ceremony, and academic excellence through his studies at IIUM. He brings Islamic finance research experience from ISRA's capital market unit in Malaysia as well as investment industry practice in institutional derivatives from the Ontario Teacher's Pension Plan, Canada's second-largest pension fund. He has several certifications and registrations in Canada's investment industry including Canadian Investment Manager, Fixed Income Trading, and Sales and Derivative Market Strategies. He has also coordinated educational and training workshops both in fiqh and Islamic finance such as "Islamic Ethics in Academic Studies" and "An Introduction to fiqh", held at IIT in Toronto, and a variety of training workshops with the Diwan of Fiqh Research and Consultancy at IIUM such as "Formulation of Islamic Contracts". He has written, published, and taught classes on the fiqh and usul al-fiqh, Maqasid al-Sharīʿah, and reward and risk theory in Islamic finance. His areas of research include Islamic banking products and structuring as well as the interaction of Islamic economics and Islamic banking and finance.

Suleiman Dalhatu Sani, MSc, is a Fellow Chartered Certified Accountant (FCCA, UK) and an AAOIFI Certified Sharīʿah Advisor and Auditor (CSAA) with over a decade of experience in the Global Finance Industry. He has worked with leading organizations such as the Islamic Development Bank Group as a

Senior Islamic Finance Expert, and Deloitte in Audit and Advisory. He has vast experience in establishing Islamic banks, converting conventional banks to Islamic procedures, and structuring Islamic finance solutions and regulations. Suleiman has top educational qualifications from global leading institutions such as IE Business School, Madrid (MSc Islamic Finance). He was among 13 successful finalists stringently selected from over 1,800 candidates in the world to join the Islamic Corporation for the Development of the Private Sector (ICD)'s industry gold standard Islamic Finance Talent Development Program (IFTDP), aimed at creating a pool of highly talented Islamic Finance Executives capable of leading the Global Islamic Finance Industry. He is an award-winning Islamic finance professional, having graduated with the highest score globally of 93% in the UAE-based Ethica Institute's Certified Islamic Finance Executive (CIFE) program.

Tita Nursyamsiah, MSc, is a lecturer in the Islamic Economics Department, Faculty of Economics and Management, and Secretary of the Center for Islamic Business and Economic Studies (CI-BEST) IPB University. She received her bachelor's degree at IPB University and her master's degree at the International Islamic University Malaysia (IIUM). She has been involved in many government and non-government research programs, including the Financial Services Authority, Indonesia Deposit Insurance Corporation, Center of Strategic Studies (PUSKAS) BAZNAS, National Islamic Finance Committee, and national Islamic philanthropy organizations such as Inisiasi Zakat Indonesia (IZI) and PPPA Daarul Qur'an. Her research areas are mainly in Islamic financial institutions, Islamic social funds, and Halal industry. In addition, Tita Nursyamsiah has published articles in reputable national journals, including *Iqtishadia*, *Al-Muzara'ah*, *Tazkia Islamic Finance and Business Review*, *Economic Journal of Emerging Markets* (EJEM), and *Walisongo: Journal of Socio-Religious Research*. She was awarded the Best Paper Finalist in the 1st Islamic Economics and Finance Research Forum in 2012 and Best Paper Winner in the 2nd Islamic Economics and Finance Research Forum in 2013.

Asif Zaman, PhD, holds an MBA from the University of Wales and a PhD in Islamic Banking from Cardiff Metropolitan University. He is a full-time Senior Lecturer in Strategy and International Business, Islamic Finance, and Accounting and Finance at Cardiff Metropolitan University, South Wales, UK. Asif has more than 12 years of lecturing experience in the higher education sector within the UK and the Middle East. He is a Certified Management & Business Educator (CMBE), awarded by the Chartered Association of Business Schools (CABS). He has taught International Political Economy for some years, raising awareness among students to develop an interest in geopolitics and international relations. This has led Asif to develop a keen interest in the field of Islamic banking and finance and hence, he is an AAOIFI (Accounting and Auditing Organization for Islamic Finance Institutions) compliant CIFE

(Certified Islamic Finance Executive). CIFE has encouraged Asif to build national and international reputation and associations in the arena of Islamic Banking and Finance. He is a senior advisor and an Executive Board Member of the International Center for the Protection and Freedom of Journalists (ICPFJ). He is also a Fellow of the UK Higher Education Authority (FHEA) and an academic fellow of the Association of International Accountants, FAIA (ACAD).

Faizal Ahmad Manjoo, PhD, has a blend of three disciplines – Islamic finance, Sharīʿah, and secular law – that helps him to contribute towards the improvement of the Islamic finance industry. Currently he is the CEO of Minarah Consulting, a lawyer, a Sharīʿah scholar, and an academician. He sits on the Sharīʿah Supervisory Boards of well-known Islamic financial institutions in various jurisdictions, ranging from Re-takāful to Unit Trust and IREITs. He is likewise an active academician, helping many universities in the UK and other countries in developing their curricula for Islamic finance and Islamic law. He has also developed about 40 executive training programs in various fields like pedagogy and Islamic finance, which he has delivered in France, Dubai, Brunei, South Africa, Morocco, Tunisia, Cameroon, India, and the United Kingdom. He had the privilege of being one of the founding members of the Muslim Mediation and Arbitration Council of South Africa, which is a well-established platform for resolving conflicts between Muslims, and the Johannesburg-based Muslim Lawyers Association. He got an award for his contribution towards the Islamic finance industry in 2012 and Emerald Literati Award for his academic reviews in 2018. As a corporate lawyer he often submits legal expert opinion in the High Courts in several jurisdictions. He structures financial products for companies involving legal documentation. He additionally acts as a consultant for law firms and accounting firms on Islamic finance and law.

Mustafa Omar Mohammed, PhD, is presently the Director of the Institute of Islamic Economics and an Associate Professor at the Department of Economics, International Islamic University Malaysia (IIUM), where he has been teaching for more than 15 years. He has published more than 50 refereed journal articles and presented more than 70 papers, mostly at international conferences. He is actively involved in funded and commissioned research projects. His present research areas of interest are in waqf, zakat, Islamic microfinance, and Maqasid al-Sharīʿah. He has supervised more than 45 dissertations at PhD and master's levels. He is also a journal editorial member and reviewer panel to 11 academic entities. He has received several quality awards for teaching and research. He was part of a committee responsible for setting up the Institute of Islamic Banking and Finance and, recently, the Department of Islamic Finance at IIUM. He also has extensive experience of translation between Arabic and English. He has undertaken projects for several organizations, including MIFC, IBFIM, AIBIM, IFSB – affiliates of the Central Bank of Malaysia. He offers consultancy and has conducted several training on Islamic economics,

banking, and finance in several countries including Kazakhstan, Singapore, Sri Lanka, Bangladesh, Philippines, Indonesia, South Africa, and Uganda. Dr Mustafa holds bachelor's and master's degrees in Economics from IIUM and PhD in Finance from UniversitiSains Malaysia.

Aishath Muneeza, PhD, is an Associate Professor at INCEIF. She is the first female Deputy Minister of the Ministry of Islamic Affairs and is the Deputy Minister of the Ministry of Finance and Treasury in the Republic of Maldives. She is also the chairwoman of the Maldives Center for Islamic Finance. She is considered as the founder of Islamic finance in Maldives. Her contribution to Islamic finance includes structuring of the corporate sukuks and sovereign private sukuk of the country including the Islamic treasury instruments. She also drafted the Islamic Capital Market framework of the country and is the only registered Shari'ah advisor for Islamic capital market in the country since 2013. She played a key role in setting up the Tabung Haji of Maldives, the Maldives Hajj Corporation, and was the first chair of it. She sits in various Sharīʿah advisory bodies nationally and internationally and is chair for many of these Sharīʿah advisory bodies including the apex Shari'ah Advisory Council for capital market in Maldives. She has assisted more than 11 institutions to offer Islamic financial products/services. She has won various national and international awards for her contribution made towards the development of Islamic finance industry. She is also a role model and a mentor for women who aspire to build their careers in the Islamic finance industry and is the Vice President of Women on Boards, an NGO advocating women's representation on boards of companies. She is an invited speaker at Islamic finance conferences and events held in different parts of the world. She was listed in 2017 as number seven among the 50 Influential Women in Business and Finance by ISFIRE, an official publication of the Islamic Bankers Association, based in London, and she is among the most influential 500 in Islamic Economy. She is a member of the Association of Shari'ah Advisors in Islamic Finance Malaysia (ASAS). She holds a doctorate in law from the International Islamic University of Malaysia.

Mohamed Cherif El Amri, PhD, is an Assistant Professor at the Faculty of Business and Management Sciences, Specialized Islamic Economics, and Finance, at SabahattinZaim University. He completed his bachelor's degree in Islamic Studies from IbnTofail University in Morocco. He took his master's in Islamic jurisprudence and its principles, and his PhD in Islamic banking and finance from International Islamic University Malaysia (IIUM). He worked as an intern at several Islamic financial institutions, such as the Islamic Capital Market Business Group, Securities Commission, Kuala Lumpur, Malaysia, and Maybank Islamic. He worked as a researcher at the Institute of Islamic Banking and Finance, Malaysia. He was an Associated Consultant at Amanie Advisors, Kuala Lumpur, Malaysia. He is a member of the Scientific Committee of the *International Review of Entrepreneurial Finance* and *Journal of Islamic*

Economics and Finance. He has multiple research publications and presentations in the field of Islamic finance and economics.

Sahibzada Ghiasul Haq, PhD, is currently a professor and the Dean of Faculty of Management Sciences, Sarhad University of Science and Information Technology, Peshawar, Khyber Pakhtunkhwa, Pakistan. He holds PhD in economics from Glasgow University, UK. He is one of the top supervisors and has supervised many doctorate scholars in the university in the field of economics and management sciences. He has vast experience in the field of economics and management sciences. He has published research papers in the field of economics, Islamic economy, and Islamic finance. He has also worked on SMEs financing in Khyber Pakhtunkhwa, Pakistan.

Suhail Ahmad, MBA is currently a PhD research scholar in the Department of Business Administration at Sarhad University of Science and Information Technology, Peshawar, Pakistan. After graduating with BA (Hons) in Finance with distinction and being awarded a Certificate of Merit from the Government Post Graduate College of Management Sciences, Thana Malakand, University of Malakand Chakdara, Pakistan, he took an MBA/MS in Finance. His areas of interest include Islamic finance, poverty alleviation through Islamic finance, and microfinance. He has published research papers in the fields of finance, Islamic finance, microfinance, poverty alleviation, etc. A recent paper was published in the *International Journal of Zakat*, an Indonesia-based journal, and won the Best Paper Award.

Mohammad Abdullah Nadwi, PhD, is an expert in the theory and practice of Islamic sciences, Islamic jurisprudence, and Islamic finance. Abdullah is a well-trained and highly experienced Sharīʿah scholar, providing Sharīʿah consultancy and advisory services to various Islamic financial institutions in Europe, South America, and the UAE. He is a reputed researcher and has produced a number of research papers and book chapters on the comparative study of waqf and English trust, Sharīʿah governance, Islamic finance, and development studies. Dr Abdullah holds a bachelor's degree in Sharīʿah Sciences from Darul Uloom Nadwatul Ulama, Lucknow, India, and a master's in Islamic Banking, Finance, and Management from the Markfield Institute of Higher Education, UK. Abdullah received his PhD at the University of Gloucestershire (UK) and he is a Certified Sharīʿah Advisor and Auditor (CSSA) by the AAOIFI. Abdullah is frequent presenter of research papers and he has presented a number of papers on different aspects of Islamic banking and finance in different American, European, and Asian countries, including Germany, Norway, Italy, Ireland, Scotland, the UK, Trinidad & Tobago, Indonesia, Malaysia, India, and Dubai. He is currently based in Dubai.

Nura Abubakar Gwadabe, Held from Kano State Nigeria. Obtained a bachelor's degree in Islamic Studies from University of Maiduguri, 2007, Master of Fiqh from Al-Madinah International University, Malaysia 2014 and PhD. Candidate

Department of Shariah and Economy, University of Malaya, Malaysia from 2018 to Date. A lecturer in the Department of Islamic Studies, Faculty of Humanities, Yusuf Maitama Sule University, Kano State Nigeria. Nura Has Published a quite Number of articles related to Islamic Economics and Finance in many Peer reviewed Journals. Dr. Asmak Bint Ab Rahman, An Associate Professor and Head Department of Shariah and Economy, Academy of Islamic Studies University of Malaya. PhD. Islamic Economy, Masters in Shariah, Bachelors of Shariah all from University of Malaya. Expert in the Areas of Takāful, Islamic Banking, Economics of Waqf, Peace Economy among other Islamic Finances. Published Many articles in the peer review journals, Books and Chapters in Book

Zakariya Mustapha, LLM, practices law in Nigeria, where he has been an advocate and solicitor of Nigeria's Supreme Court since 2008. In 2010, he joined the faculty of law at Bayero University, Kano, Nigeria, as a lecturer, where he taught conventional and Islamic banking and finance law, alongside other Islamic law courses, until 2017. He specializes on legal and Sharīʿah issues in Islamic banking and finance and offers legal and Islamic financial advisory services regarding legal frameworks, dispute resolution, and Shari'ah-compliant product development in Islamic banking and finance. He has published numerous articles and presented research papers at national and international conferences. He holds a LLB, LLM, and BL with membership of the Nigerian Bar Association and Nigerian Institute of Management (Chartered). He is currently pursuing his PhD in Islamic finance law at the faculty of law, University of Malaya, Kuala Lumpur.

Fauzia Mubarik, PhD, is Assistant Professor in the Faculty of Management Sciences, National University of Modern Languages (NUML), Islamabad Campus, Pakistan. She attained the degree of Doctor of Philosophy in Management Sciences (Finance) in 2017 and has the achievement of attaining Honors in her PhD. Since 2017, she has served as the Finance Cluster in-charge in the Faculty of Management Sciences. She is the member of the National Curriculum Review Committee (NCRC), HEC. Fauzia Mubarik has published numerous research papers in the HEC-recognized journals and editorials in the *Frontier Post* newspaper and has the honor to attend and present research papers at local conferences. She also has conducted and attended trainings and workshops under the Faculty Development Programs.

Zaminor Zamzamir Zamzamin is currently a PhD candidate at the IIUM Institute of Islamic Banking and Finance (IIiBF). She has been a lecturer at the University of Malaysia, Kelantan since 2014. Previously she was a lecturer at the University of Technology, Mara from 2012 until 2014. Her research interests are in Islamic finance, investment, risk management, and derivatives. She has participated in many local and global conferences. Zaminor is an expert in data analysis using Stata software.

Razali Haron, DBA, obtained DBA (Finance) from UKM in 2012 and is currently an Associate Professor at the IIUM Institute of Islamic Banking and Finance (IIiBF). Prior to joining IIUM in 2003, he had extensive industrial experience for almost 13 years, covering the capital market, portfolio management, unit trust industry, and merchant banking in Malaysia. He served as a member of IIUM Investment sub-Committee since 2012. His research areas include corporate finance, capital markets, and portfolio management. Razali has published his research works with international publishers. Being an active researcher, he has been awarded with many awards by IIUM, among others the Best Researcher Award (2014); Best Indexed Journal Article (2014); Highest Citation in Citation Index Journal (Social Science) (2015); Top 250 Contributors to IIUM Research Performance 2015–2017 (2018); Highest Number of Publications Award (2019); and Top 30 Contributors to IIUM Research Performance (2019). He was the research coordinator at the Department of Finance (2012–2014), Headmaster of the Management Program at the Graduate School of Management (2012–2014) and Deputy Dean (Research and Publication) of IIiBF (2017–2018). He has edited three research books: *Islamic Fund and Wealth Management* (2019), *Banking and Finance* (2020), and *Islamic Social Finance and Economic Recovery After a Global Health Crisis* (2021). Very recently, his co-authored paper (with Anwar Hasan as the main author) on Bitcoin has been awarded the Highly Commended Paper in the 2020 Emerald Literati Awards. Razali is currently the Editor-in-Chief of the *Journal of Islamic Finance* and Associate Editor of *The Capital Market Review*.

Anwar Hasan Abdullah Othman, PhD, is currently an assistant professor at the IIUM Institute of Islamic Banking and Finance (IIiBF) and Deputy Dean (Responsible Research and Innovation) of the Institute. Previously he was a Post-Doctoral Researcher at the University. He obtained his PhD (Business Administration – Finance) from IIUM in 2015. He is currently the Editor of the *Journal of Islamic Finance* and *Turkish Journal of Islamic Economics*, and Associate Editor of the *International Journal of Al-Turath in Islamic Wealth and Finance*. Previously he was a lecturer at Universiti Kebangsaan, Malaysia (UKM), Lincoln University College, Malaysia, a senior financial/accountancy trainer at Geomatika University College, and British Academy Center for Training and Development in Kuala Lumpur, Malaysia. Anwar was also a finance manager at the International Communication Academy (ICA), Kuala Lumpur, Malaysia. In addition, he was also a finance manager at AL Rwaishan Investment & Development Co. Ltd, Sana'a, Yemen as well as an auditor and accountant in many companies in Yemen. He has many publications, focusing on monetary policy, cryptocurrency, micro and macroeconomic policies, assets pricing, unit trust funds, banking, and equity markets. Anwar has membership of many research organizations and has participated in many local and global conferences and world economic forums on business, economics, finance, and social sciences. Anwar has strong skills in data analysis using

different statistical models and software and is currently supervising many PhD candidates at the Institute.

Ahmed Abdul Rehman, **MA,** is a teaching professional and academic advisor. He has vast experience of teaching and administration in the higher education sector. He has taught various subjects at the undergraduate and postgraduate levels, including Islamic Worldview, Islamic Civilization, Islamic Law, Islamic Banking and Finance, Arabic and Islamic Studies, Qawaid Fiqhia, and the Legal Study of the Holy Qur'an at the International Islamic University, Islamabad, NUST (National University of Science and Technology), and NUML (National University of Modern Languages), Pakistan. Along with teaching, he provides consultancy on educational reforms and development. In that domain, he has worked with the Falcon Wisdom Foundation and many international bodies and NGOs for educational reforms. His areas of research interests are Islamic thought and contemporary issues, Islamic law, and Islamic finance. Currently he is teaching at the Institute of Management Sciences, Peshawar, Pakistan and pursuing his PhD in the Islamization of Knowledge from the Allama Iqbal Open University, Islamabad, Pakistan.

Muhammad Umar Farooq, PGD, is a research scholar and teaching professional. He did his postgraduate diploma in legal fatwa writing from Al-Burhan, Shahadat ul Aalmia from Jamia Darul Uloom, Karachi, Pakistan and his master's in Islamic Commercial Law from the International Islamic University, Islamabad. He has a keen interest in Islamic law, Islamic economics, and Islamic finance.

FOREWORD

Contemporary Islamic financial activities began in 1963. In the last 58 years Islamic finance has significantly secured its global platform with utmost appreciation. It is not merely confined within Muslim countries, but has crossed the border into the non-Muslim world with a red-carpet welcome. The asset size of Islamic finance hits nearly USD 3 trillion, while its annual growth rate is about 15–18%, a significant achievement as compared to what the conventional counterpart achieves. Islamic financial products and services are not a new dimension in the contemporary economic era, and have been rapidly growing with utmost appreciation from different classes of the global markets, despite numerous shortcomings that are surrounding them. People across the world and particularly Muslim communities are expecting niche Sharīʿah-compliant financial products to meet the demand in the multi-dimensional markets with accurate ratings and valuations. It has been observed that no adequate customer-friendly Islamic financial products are available yet. It is due perhaps to the fact that the interbank benchmarking mechanisms are still mainly influenced by the LIBOR in the absence of any comprehensive Sharīʿah solution to benchmarking. It is worth noting here that there are numerous product rating agencies who claim to have designed enough Shari'ah financial products with interbank benchmarking in the certain jurisdictions, but they do not have globally effective results yet.

There are books, articles, and other items of research on rating, valuation, and benchmarking Islamic finance, perhaps theoretical, but no comprehensive practical solutions to Islamic financial benchmarking exist yet to meet the global demand for a Sharīʿah-compliant benchmarking formula to Islamic financial products and services designed by the academia, industries, professionals, and policy makers today.

The LIBOR is expected to cease its execution in mid-2021. A series of questions arise: does Islamic finance require benchmarking? Does Islamic finance depend on the LIBOR in its benchmarking? What will happen for Islamic finance in its benchmarking in the absence of the LIBOR? Is Islamic finance prepared with its own Sharīʿah-compliant benchmarking? What will be the framework or technical know-how of Islamic benchmarking to meet the demand of the world Islamic financial industries in the demise of the LIBOR?
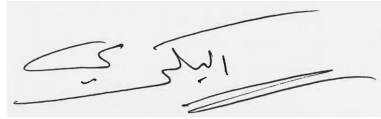
In resolving those queries and problems faced by the Islamic financial industries in their interbank benchmarking exercises within the principles of Maqasid al-Sharīʿah, the initiative of the world-renowned and highly respected Islamic finance scholar Prof. Dr Mohd Ma'Sum Billah of Islamic Economics Institute, King Abdul Aziz University, in producing this book is timely to meet the demand of the contemporary world to benefit from Sharīʿah-compliant benchmarking solutions to financial products and services. I found this book, which addresses the subject with comprehensive analysis, intellectual discussions, and empirical solutions, to be among the pioneer guides and references for academia, researchers, professionals, industrialists, customers, entrepreneurs, decision makers, promoters, programmers, students, and people in general who are involved in or interested in Sharīʿah compliance benchmarking financial products and services.

It is my privilege with honor to write this foreword for this prestigious title. May we all be blessed with true knowledge and its rightful practices.

Signature:

Name: YB SENATOR DATUK DR ZULKIFLI BIN MOHAMAD AL-BAKRI
Designation: MINISTER IN THE PRIME MINISTER'S DEPARTMENT (RELIGIOUS AFFAIRS)
Organization: THE GOVERNMENT OF MALAYSIA
Country: MALAYSIA
Date: 4ᵀᴴ MARCH 2021

PREFACE

The issue of benchmarking Islamic financial products and services is an emerging chapter of utmost concern across the world of Islamic banking and finance. It has been observed that despite a significant achievement is Islamic financial products and services since 1963 with gradual effect, their interbank benchmarking exercise had depended mainly on the LIBOR (an interest-bearing benchmarking platform) without having a Sharīʿah-compliant benchmarking formula yet. There are numerous literatures on Islamic finance as well as resource centers, but undesirably it has been observed that there is no comprehensive literature addressing exclusively Sharīʿah-compliant solutions to benchmarking Islamic financial products and services. The impact of such a phenomenon is that the industry, customers, promoters, professionals, and even academia are suffering with confusion. This book is therefore timely to contribute with numerous Sharīʿah-justified solutions to benchmarking Islamic finance. This book, however, contributes with a Sharīʿah paradigm of benchmarking Islamic financial products and services, their policies, technical know-how, mechanisms, and empirical analysis. The book addresses some core and specialized issues with Sharīʿah solutions to benchmarking Islamic finance as an alternative to LIBOR, which are in four parts with 17 specialized chapters besides an introduction and an index.

Part I provides an analytical submission with a goodbye to the LIBOR while focusing on the emergence of benchmarking in the Islamic financial system, which consists of five chapters addressing different core issues of benchmarking. Chapter 1 contributes on whether Islamic finance needs benchmarking and, if so, how its framework may be. Chapter 2 discovers a solution to the query on why Islamic finance requires benchmarking. Chapter 3 provides a paradigm of an alternative Islamic interbank benchmarking mechanism. Chapter 4 focuses on Islamic finance, benchmarking, and the LIBOR transition. Chapter 5 contributes a SWOT analysis of benchmarking in the Islamic finance industry.

Part II focuses on the Sharīʿah analysis of benchmarking Islamic finance, which consists of seven chapters with Sharīʿah and jurisprudential solutions to benchmarking Islamic financial products and services. Chapter 6 discusses the Qurʾānic solution to benchmarking the financial system. Chapter 7 discovers how Sunnah recognizes a benchmarking formula for the Islamic financial system.

Chapter 8 advocates the Sharīʿah analysis of benchmarking in the Islamic financial system. Chapter 9 presents a fiqh analysis of benchmarking in the Islamic financial products and services. Chapter 10 contributes with an analysis of fatwas governing benchmarking Islamic financial products and services. Chapter 11 also provides a fatwa analysis of benchmarking in the Islamic financial system. Chapter 12 analyzes traditional benchmarking experiences from a Maqasid al-Sharīʿah perspective.

Part III contributes on law and compliance to facilitate benchmarking Islamic finance. The part consists of two chapters contributing on legal and compliance solutions. Chapter 13 discusses on legal and compliance reform for Islamic financial benchmarking. Chapter 14 contributes on the implications of the regulatory shift from LIBOR to the SONIA benchmark for the Islamic banking industry in the UK.

Part IV contributes on testing and experiences in benchmarking Islamic finance. The part consists of three different tests and experiences of benchmarking formulas applicable in Islamic financial products and services, which are presented in three specialized chapters. Chapter 15 provides a comprehensive analysis of how benchmarking matters in Islamic microfinance. Chapter 16 analyzes on what the benchmarking formula in Islamic SME financing may be. Chapter 17 contributes with an analysis of foreign currency and rate derivatives on firm value.

It is submitted that, in the event of a goodbye to the LIBOR, the idea of benchmarking Islamic finance and its emergence are capturing the attention and appreciation of all levels of Islamic financial industries across the contemporary world, yet no significant or comprehensive research with applied solution to benchmarking Islamic finance is ready yet, so there are few reliable references for continuing academic research or industrial solutions in meeting the demand of practicality with technical know-how in benchmarking Islamic financial products and services, except jurisprudential thoughts available in the library and/or as occasional research or in social media. Thus, this title (*Benchmarking Islamic Finance: A Framework for Evaluating Financial Products and Services*) is expected to be among the pioneers with organized and comprehensive applied solutions to Sharīʿah-compliant benchmarking solutions for Islamic financial products and services led by holistic approach of divine principles, which may be a guide to academia, researchers, financial industries, practitioners, decision makers, programmers, professionals, promoters, and students for their technical know-how, future research, and development of furtherance solutions to benchmarking Islamic finance. It is not impossible that the book contains shortcomings. We are thus grateful to all readers should any shortcoming be notified to us for further improvement.

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Mohd Ma'Sum Billa
Islamic Economics Institute
King Abdulaziz University
Saudi Arabia

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ACKNOWLEDGMENT

INTRODUCTION

Pricing or benchmarking is a process of evaluating the performance of a financial company's products and services or processes against those of another business considered to be the best in the corporate sector by applying a measurement of "best in performance". The prime objective of benchmarking is to identify the internal opportunities for a furtherance progress and due achievement. In analyzing financial companies with high achiever performance, breaking down what makes such high achiever performance foreseeable, and then comparing those processes to how one's financial activities are implemented, one may make changes that will yield significant impact. It may denote tweaking a financial product's features to more closely match a competitor's offering in the market, or changing the scope of services one offers, or establishing a new customer relationship management (CRM) system to enable more personalized communications with customers as to significant results. There are two important factors in creating opportunities with significant goals, namely continuous and dramatic. Continuous upgrading is incremental, involving only small adjustments to reap sizable improvements. Dramatic upgrading can only come about through reengineering the whole internal work process as to reality.

It is hearsay that the influence of the LIBOR or EURIBOR may be said goodbye to in 2021; thus, there is concern over whether the Islamic financial system has been depending on the LIBOR or EURIBOR in its benchmarking exercise. Will the Islamic financial system be affected negatively by the non-existence of the LIBOR or EURIBOR? Does the Islamic financial system practice any benchmarking? Does the Islamic financial system really need benchmarking in its products and services? How will a Sharīʿah-justified benchmarking emerge in today's Islamic financial system, particularly in the competitive global market? How will a benchmarking formula be adapted by the Islamic financial system in its best performance and assure customer satisfaction within the Maqasid al-Sharīʿah?

Analyzing the aforementioned queries, this book is timely in submitting that the Islamic financial system does not need to be dependent on the LIBOR or EURIBOR, nor be affected by their non-existence. Thus, the book intends to focus and provide solutions with a comprehensive Sharīʿah-justified benchmarking formula and its technical know-how for the Islamic financial system, aiming at

advancing the progress of the Islamic financial system as to its innovative products and best customer service. The title will continue in contributing an alternative benchmarking for the Islamic financial system as to its criteria, model, formula, and technical know-how within the ambit of Maqasid al-Sharīʿah. The book aims at contributing a series of chapters with specialized treatment (solutions) addressing the market niche and need as to Sharīʿah-compliant benchmarking for Islamic financial products and services. Furthermore, the book also focuses on the emergence of benchmarking in the Islamic financial system and its reality paradigm with technical know-how.

17

FOREIGN CURRENCY AND RATE DERIVATIVES ON FIRM VALUE

A Sharīʿah Experience

Zaminor Zamzamir Zamzamin, Razali Haron, Anwar Hasan
Abdullah Othman, and Rusni Hassan

Introduction

Risk management practices undertaken by firms are meant to reduce risk. Understanding the most critical risks facing the firms enables stakeholders, especially managers, to carry out necessary measures to mitigate the adverse consequence of risk on firm value. Recently, a massive growth in derivatives usage is reported among firms around the world (Bartram, 2019). Thus, risk management is essential to firm operation and any failures of a firm in managing risk will impact its performance. Good risk management practice therefore becomes the priority of shareholders. Bouwman (2014) stated that firms use derivatives as an effective tool for managing risk. In line with this argument, Antônio et al. (2019) confirmed that firms used derivatives for risk protection. In addition, Barton (2001) stated that firms used derivatives to minimize the impact of earnings volatility and interest rate risk, while Dewally and Shao (2013) reported that derivatives are used to reduce risk exposure. Derivatives, therefore, are hedging instruments for risk management during crises (Bartram, 2019).

Recently, most non-financial firms used derivatives for risk management and they became the most effective and efficient tool for corporate hedging (Bartram, 2019). Based on the available data from the Bank of International Settlements, the market for the over-the-counter (OTC) instruments and exchange-traded derivatives (ETD) on foreign exchange rates and interest rates have exhibited exponential growth over the past 14 years, as shown in Figure 17.1. The notional amount outstanding on foreign currency derivatives shows an upward trend starting from 2010 and that keeps increasing over the years, reaching USD 99 trillion in 2019 while interest rate derivatives rose significantly between 2017 and 2019. In addition, the OTC notional amount outstanding at the end of 2019 stood at around USD 60 trillion. This situation is also similar to the derivatives market in Malaysia. The total notional amount outstanding on OTC derivatives, comprising foreign currency derivatives and interest rate derivatives, grew to RM 171 billion
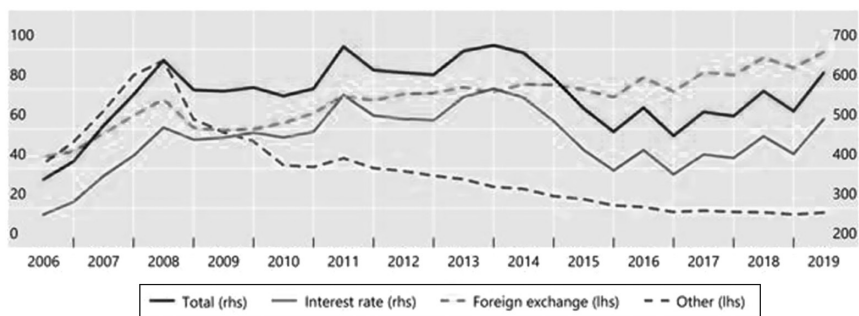
Figure 17.1 The notional outstanding amount of derivatives from 2006 to 2019 (trillion USD). *Source: Bank of International Settlements*

in 2003. Meanwhile, derivatives trading, which includes both OTC and ETD, is expected to account for the major part of this growth, with the notional amount projected to increase from RM 171 billion to RM 1.4 trillion by 2020. This upward trend shows the increasing use of derivatives over the years, indicating its importance as risk management instruments. In relation to Malaysia, Hong et al. (2018) and Bank Negara Malaysia (2017) stated that foreign currency derivatives are the most used derivatives instrument among the Malaysian listed firms.

With regard to crisis, many firms and financial institutions collapsed during the East Asian Financial crisis of 1997 and subsequently during the 2007/2008 global financial crisis due to poor risk management (Siddika and Haron, 2020). Following this, the crisis had shaped the scope of derivative instruments in most of the countries. The collapse of some established and prominent US banks and financial institutions such as Lehman Brothers, Merrill Lynch, and National City Bank (Siddika and Haron, 2020) and firms in Brazil (Zeidan and Rodrigues, 2013) raised many questions on the effectiveness of risk management using derivatives. On the same ground, Dodd (2009) reported 12 countries in emerging markets incurred losses in exotic derivatives due to poor risk management. Following this, the huge losses related to derivatives have increased the demand for standard reporting on derivatives activities (Blankley et al., 2002). Despite this, derivatives continue to become a popular hedging instrument among firms for risk management (Ayturk et al., 2016; Seng and Thaker, 2018).

Chong et al. (2014) nevertheless reported that the volume of financial derivatives trading in Malaysia is relatively low compared to neighboring countries such as Singapore, Hong Kong, and South Korea. Due to this, they argued that market players in Malaysia need to be educated on the use of derivative instruments for risk management. Ameer et al. (2011, 2012) also reported that awareness of derivatives among firms in Malaysia is still low and most managers do not realize the function and importance of derivatives as a hedging instrument especially during the period of uncertainties. They also added that the practice of derivatives

among Malaysian firms is not as extensive as those in developed countries due to their lack of exposures, which are generally considered to be costly and complex products. This is proven by Lau (2016) who reported merely 26.8% of Malaysian firms have derivative contracts in their operation, while the rest of them did not use any derivatives. Besides, Abdullah and Ismail (2017) also found that only 29.6% (48 firms) of the Malaysian listed firms chose to provide information on their derivatives positions while the rest of the firms failed to do so. This phenomenon is also reported by Ameer (2009), who notes that 298 firms in Malaysia did not participate in any form of hedging instruments during the period under study.

Recently Islamic finance has grown very rapidly all around the world. The Islamic financial asset was worth around USD 1.66 trillion in 2014 and continued to grow to USD 3.4 trillion in 2018. In 2015, the overall total value of Islamic financial assets was about USD 1.87 trillion despite the slowness and various challenges in the global economy (Ahmed, n.d.). In line with the rapid growth in Islamic finance, derivatives are becoming a popular hedging instrument among Islamic financial institutions (IFIs) and this includes the Sharīʿah compliant firms. Islamic finance according to Baber (2018) and Nafis and Mohammad Shadique (2016) becomes an alternative due to the weaknesses of the conventional financial system. Furthermore, researchers have documented that IFIs are better equipped to cope with economic downturns during financial crises compared to their counterparts (Baber, 2018; Nafis and Mohammad Shadique, 2016). Despite this, the Sharīʿah-compliant firms as part of the Islamic capital market (ICM) also experience the same risk such as currency risk, interest rates risk, commodity risk, and operational risk. The future sustainability of ICM thus depends on its capacity to deal with the rapidly changing financial landscape. Firms in the ICM need to be well positioned to overcome the challenges posed by the financial landscape in terms of the latest risk management techniques and operational system.

Based on this scenario and with limited empirical evidence on hedging and firm performance on Malaysian firms (Seng and Thaker, 2018), this study aims to examine the impact of foreign currency and interest rate derivatives on firm value of Sharīʿah-compliant firms. The findings of this study therefore will fill the gap in the literature pertaining to the risk management strategies of Malaysian Sharīʿah-compliant companies and impact on firm performance.

Literature review

Studies on hedging are voluminous. Before the development of hedging theory, most scholars referred to and relied on the classical Modigliani and Miller paradigm. This classical paradigm of Modigliani and Miller (MM) states that financial policy decisions have no impact on firm value (Modigliani and Miller, 1958). However, some researchers have challenged the MM theory due to its contradiction with the risk management practices. Some researchers (Belghitar et al., 2013; Bouwman, 2014; Antônio et al., 2019) recommend that hedging that uses derivatives is a value-increasing strategy for the firm. Hedging refers to activities

undertaken by a firm to mitigate the impact of uncertainties on the value of the firm (Mian, 1996). Hedging theory is first discussed by Stulz (1984), who stated that if external financing is more costly than internal financing, hedging is a value-enhancing activity. This is if it closely matches fund inflows with outflows and decreases the probability that a firm needs to access the capital market. Hedging ensures that a firm has sufficient internal funds to avoid unnecessary fluctuations of risk, and thus increases firm value. Demarzo and Duffie (1995) and Froot et al. (1993) specified that tax incentives, underinvestment cost, financial distress, and managerial compensation could increase firm value through hedging. Allayannis and Ofek (2001) reported that the inaccessibility of data on hedging activities, however, causes a lack of empirical investigation on hedging. Furthermore, in the early 1990s, information on derivatives in firms was confidential as it was considered a strategic competitiveness component. Firms nowadays are required to disclose all information (risk management and financial derivatives) in the footnote of their annual reports in an off-balance sheet section. Researchers have to use data reported in the off-balance sheet of financial statements to examine the value relevance and the usage of derivatives for hedging. Geczy et al. (1997) analyzed the use of currency derivatives and found that firms that are exposed to risk tend to use currency derivatives to increase firm value.

From the Islamic finance perspective, hedging is a method of precaution or minimizing loss from the risk that persistently exists in the financial market. Many Qurʾānic verses offer guidelines and suggest men should have risk management in their life. There is a section in the Qurʾān that discusses the financial context of risk management, implying that risk management and hedging activity are significantly important, as mentioned in Surah Yusuf (12: 47–48).

Yusuf conveyed,

> You will plant for seven years consecutively; and what you harvest leave in its spikes, except a little from which you will eat. Then after that seven difficult (years), which will consume what, you save for them, except a little from which you will store. Then will come after that a year in which the people will be given rain and in which they will press (olive and grapes).

Prophet Yusuf translated the dream of the King based on the verse. Subsequent to the seven years of prosperity in Egypt, the Kingdom would experience seven years of dry season, and to overcome the upcoming disaster, the Prophet recommended the King to strategize the economy of the country. Specifically, Egyptians should prepare the activity of planting the crops and store as much as possible for the preparation of the long seven-year drought. As a result, the people were able to survive when the dry season hit for seven years (Ibn Kathir, 1988). Therefore, it is evidence that managing risk is vital, for risk, if not well managed, can bring destruction.

Recent empirical studies link firm value to hedging with the evidence available for both ends of the debate. Bhagawan and Lukose (2017) reported that to hedge currency exposure, firms are more likely to use derivatives. This is in line with

Chong et al. (2014) who found that the use of derivatives is to minimize risk, hence increasing firm value. Besides, Allayannis and Weston (2001) claimed that foreign currency derivatives and firm value is positively significant. They also recorded that firms are exposed to currency risk and the use of derivatives for hedging is to create higher firm value. In contrast, firms that do not hedge will be affected and drop in firm value. Tanha and Dempsey (2017) also found that financial risk (such as interest rates, foreign exchange, equity) and commodity risk have influence on firms to hedge. Besides, Bartram et al. (2011) also found a positive relationship between the use of derivatives and firm value. They examined the effect of hedging on risk and value on non-financial firms from 47 countries and found evidence on the value relevance issue. Conversely, Bae et al. (2017) in their study on firms in the manufacturing and services industries in Korea, found that foreign currency derivatives fail to increase firm value. In another study by Bae and Kim (2016), it was reported that the heavy usage of foreign currency derivatives by Korean firms led to lower firm risk. However it failed to increase firm value due to inefficient hedging practices of the firms. Magee (2013) found no relationship between foreign currency derivatives and firm value. Belghitar et al. (2013) also found no significant influence of foreign currency derivatives on firm value in the sample of French non-financial firms.

Meanwhile, Bartram et al. (2009) investigated interest rate hedging in a large sample of multi-industry firms and found a positive correlation between hedging activities and firm value. In contrast, Ayturk et al. (2016) reported that the majority of financial derivatives (currency, interest rate, and commodity) do not influence firm value in the Turkish market based on Tobin's Q. Meanwhile, Panaretou (2013) investigated the effect of hedging on large UK firms and found that only currency hedgers showed significant hedging benefit. There is, however, weak evidence on interest rates with no evidence to support the value relevance on commodity. Their findings are also similar to those reported by Jin and Jorion (2006) who found that interest rate derivatives do not have any effect on firm value for the oil and gas industry but hedging reduces firm stock price sensitivity to oil and gas prices. Following such varied findings on empirical evidence of foreign currency and interest rate derivatives among the non-financial firms, this study hypothesizes the following:

H1. A significant positive relationship is expected between foreign currency derivatives and firm value of Sharīʿah-compliant firms.

H2. A significant positive relationship is expected between interest rate derivatives and firm value of Sharīʿah-compliant firms.

Data and research methodology

Sample selection

The sample data of this study involves the non-financial firms that engaged in derivatives from 2000 to 2017. Firms' engagement in derivatives is found by referring to their annual reports at the off-balance sheet section in accordance with

the standard of reporting of financial instruments and disclosure of the MFRS 7 (Financial Instrument Disclosure). The MFRS 7 is in line with the International Financial Reporting Standard (IFRS) 7 Financial Instrument: Disclosure, issued by the International Accounting Standard Board (IASB). It is compulsory for firms in the US, the UK, Australia, Canada, and New Zealand as well as firms in other countries that comply with the International Accounting Standard (IAS) to reveal information on their derivatives position (Bartram, 2019). Malaysia is also no exception to disclosing the information on derivatives positions.

The number of firms listed in the main market in Bursa Malaysia keeps changing over the years. There are 905 firms listed in the main market of Bursa Malaysia as at December 2017. Out of these, only firms that are consistently engaged in derivatives are chosen and the engagement in derivatives is irrespective of any years during the study period. Therefore, after the filtering process, only 59 Sharī ʿah-compliant firms that are consistently engaged in derivatives are selected in this study. The financial reports were downloaded from Bursa Malaysia's website in an electronic format. The information on firms with derivatives positions is scanned using the following keywords: risk management, derivatives, foreign exchange forward, forward foreign exchange, forward contract, forward exchange contract, interest rate derivatives, and interest rate swap.

The sample firms in this study involve the Sharī ʿah-compliant firms. Following Ramli and Haron (2017), the Sharī ʿah-compliant firms need to fulfill certain criteria i.e., the firm must consistently be Sharī ʿah-compliant every year starting from 2000 until 2017 and in accordance with the Securities Commission Malaysia (SC) Sharī ʿah-compliant yearly listing. This is in contrast to the selection of Sharī ʿah-compliant according to only a specific cut-off year; say, for example, only based on November 2017 as per SC Sharī ʿah-compliant listing. Ramli and Haron (2017) argued that the consistency in Sharī ʿah-compliant listings reflects the real Sharī ʿah-compliant status of the firms.

Dependent variable

Tobin's Q acts as a proxy for the dependent variable representing firm value. The measurement of the value of the firm is defined as equity market capitalization (market value) plus total liabilities (book value) over total assets (book value) following the study of Allayannis et al. (2011), Ayturk et al. (2016) and Haron et al. (2020). For a robustness check, the study also uses ROA and ROE as alternative measurements for firm value. Data on firms are collected from the DataStream database.

Explanatory variable

Financial derivatives are represented by foreign currency derivatives and interest rate derivatives with expected influence on firm value. The value of foreign currency derivatives and interest rate derivatives is according to the notional value of the derivatives contracts divided by total assets, in line with past studies (e.g.,

Allayannis and Weston, 2001; Ayturk et al., 2016; Bae et al., 2018; Bartram et al., 2011; Jin and Jorion, 2006; Magee, 2013). Data on foreign currency and interest rate derivatives are manually collected from the annual reports of the firms.

Control variables

Ten control variables are included to explain firm performance.

Managerial ownership

Adam and Fernando (2006) found managerial ownership influences risk management decision and firm value, further supported by Fahlenbrach and Stulz (2009), and Coles et al. (2012). Ameer (2010) recorded a significant relationship between managerial ownership and firm value of Malaysian firms. Seng and Thaker (2018) found managers took fewer hedging positions when they owned more shares, hence confirming a significant negative relationship between managerial ownership and corporate hedging, and firm value of Malaysian firms. Supanvanij and Strauss (2010) reported that managerial ownership is negatively related to firm hedging position. Managerial ownership is measured based on total shareholding (direct) owned by directors over the total common shares outstanding at the end of each year in the firm (Ahmad and Haris, 2012; Ameer, 2010; Haron et al., 2020).

Access to financial market

If firms forgo projects because they are unable to obtain the necessary financing, their firm value remains high because only positive net present value (NPV) projects are being pursued. Allayannis and Weston (2001) and Magee (2013) stated that firms paying dividends are less likely to face capital constraints and can reduce their dividend to increase investment. Following Law (2016) and Allayannis and Weston (2001), the proxy for access to the financial market means a firm that pays dividends in the present year equals "1" and "0" otherwise.

Firm risk

Past studies reported that heavy use of foreign currency derivatives by Korean firms leads to lower firm risk and higher firm value (Bae et al., 2017). Choi et al. (2013) also found that firms engaged in derivatives have lower firm risk and higher firm value. Following these studies, the measurement of firm risk is based on the average standard deviation of daily stock returns and then annualized to yearly return.

Firm size

Firm size is reported to have influence on firm value. Past studies reported that firm size has a significant positive relationship with hedging decision, hence increases

firm value (Allayannis et al., 2011; Lau, 2016; Magee, 2013). However, Allayannis and Weston (2001) and Ayturk et al. (2016) found that firm size negatively related to firm value. The proxy for the firm size is the natural logarithm of total assets.

Industrial diversification

Industrial diversification similarly influences firm performance. Highly diversified industries have a higher value compared to low diversified industries (Allayannis and Weston, 2001; Ayturk et al., 2016; Bae et al., 2017; Bartram et al., 2011; Nguyen and Faff, 2010b). This study uses the 1-Herfindahl-Hirschman Index (HH Index) to control the effect of industrial diversification as adopted by Berger and Ofek (1995), Lang and Stulz (1994), and Servaes (1996). The estimation of the HH Index is calculated from firms' sales by segment. The HH Index is calculated based on the total of the squared sales value for each segment as a fraction of total firm sales.

Industry effect

This study also controls for industry effect. The decision to engage in derivatives by a firm is also influenced by the industry to which they belong (Allayannis and Ofek, 2001). If a firm that uses derivatives belongs to a high-Q industry, for example the technology-intensive industry, the firm is expected to generate more profit due to the industry itself (Lau, 2016). Therefore, to control for industry effect, this study first constructs the industry-adjusted Tobin's Q, then computes the log difference between the weight-adjusted industry Q and multi-segment for each firm (Allayannis and Weston, 2001; Ayturk et al., 2016; Lang and Stulz, 1994).

Investment growth

Firms tend to have large investments and depend on future investment opportunities to grow. The growth eventually influences firm value. This study follows Yermack (1996) and Allayannis and Weston (2001) by using the ratio of capital expenditure to sales as a measurement for investment growth.

Leverage

The capital structure of the firms affects firm value. Thus to control for capital structure, this study uses long-term debt divided by total shareholder equity (Allayannis et al., 2011; Allayannis and Weston, 2001; Ayturk et al., 2016; Jin and Jorion, 2006; Panaretou, 2013).

Time

Regarding the MFRS, it is compulsory for Malaysian listed to disclose the exposure in derivatives in their annual reports starting from the year 2012 onwards.

Following the MFRS guideline, therefore, from 2000 to 2011 equals "0" and 2012 to 2017 equals "1". Allayannis and Weston (2001) and Lau (2016) used time effect as control variable since time is a proxy for economic and business condition. This study expects that the time effect is positively significant due to the importance of MFRS disclosure requirement.

Year crisis

This study also controls for year crisis (dummy) in which the crisis years (2007 and 2008) are categorized as "1" while the non-crisis year (other years) as "0". The consideration of crisis year is important since the economic trend might have a structural break where the economic condition is getting better after the global financial crisis (Abdul Bahri et al., 2018; Zeidan and Rodrigues, 2013).

Regression model

This study first examines the relationship between foreign currency derivatives and firm value of Sharīʿah-compliant firms in a panel data form as follows:

$$Q_{it} = \beta_0 + \gamma Q_{it-1} + \beta_1 FCD_{it} + \beta_2 MO_{it} + \beta_3 ACCES_{it} + \beta_4 RISK_{it} + \beta_5 SIZE_{it}$$

$$+ \beta_6 DIV_{it} + \beta_7 INDUSTRY_{it} + \beta_8 GROWTH_{it} + \beta_9 LEV_{it}$$

$$+ \beta_{10} TIME_{it} + \beta_{11} CRISIS_{it} + \eta_i + \varepsilon_{it}$$

Model 1

Where Q_{it} is firm value, measured by Tobin's Q for firm i in period t. To capture the persistence in firm value, the lagged value of Tobin's Q is included as an independent variable whereas $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}$ are the slopes parameter to be estimated. The explanatory variable is FCD_{it} (foreign currency derivatives) while the control variables consist of MO_{it} (managerial ownership), $ACCES_{it}$ (access to financial market), $RISK_{it}$ (firm risk), $SIZE_{it}$ (firm size), DIV_{it} (industrial diversification), $INDUSTRY_{it}$ (industry effect), $GROWTH_{it}$ (investment growth), LEV_{it} (leverage), $TIME_{it}$ (dummy time), and $CRISIS_{it}$ (dummy crisis). While η_i is an unobserved firm-specific term and ε_{it} is an error term. H_1 states that a significant positive relationship is expected between foreign currency derivatives and firm value.

This study employed the system-GMM (Generalized Method of Moments) for dynamic panel data as proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate the regression in Model (1) and Model (2). GMM is effective when the moment conditions are exercised in the model framework and the data with a certain number of moment conditions are specified for the model. Therefore panel GMM provides a solution for the endogeneity issues by substituting the endogenous variables with instrumental variables. System-GMM offers

better elasticity to the variance-covariance framework and has greater effective-ness, improves accuracy and addresses endogenous issues in the model (Baltagi, 2005). This study also performs several diagnostic tests that include the validity test of the instruments and serial correlation test as recommended by Arellano and Bover (1995) and Blundell and Bond (1998). The Hansen test is employed to check the validity of the instruments used, while AR (1) and AR (2) are for the serial correlation tests. Hansen test has null of valid instruments while AR (1) and AR (2) have nulls of the absence of first-order and second-order serial correlation in the residuals, respectively. For AR (1) the null hypothesis should be rejected and the failure to reject the null hypothesis for AR (2) tests indicates that the regression model is robust.

The second objective is to examine the relationship between interest rate deriv-atives and firm value of Sharīʿah-compliant firms in a panel data form as follows:

$$Q_{it} = \beta_0 + \gamma_1 IRD_t + \gamma_2 MO_{it} + \gamma_3 ACCES_{it} + \gamma_4 RISK_{it} + \gamma_5 SIZE_{it}$$

$$+ \gamma_6 DIV_{it} + \gamma_7 INDUSTRY_{it} + \gamma_8 GROWTH_{it} + \gamma_9 LEV_{it}$$

$$+ \gamma_{10} TIME_t + \gamma_{11} CRISIS_t + \eta_i + u_{21it}$$

Model 2

Where Q_{it} is firm value, measured by Tobin's Q for firm i in period t. To capture the persistence in firm value, the lagged value of Tobin's Q is included as an independent variable. The explanatory variable is IRD_{it} (interest rate derivatives) while the control variables consist of MO_{it} (managerial ownership), $ACCES_{it}$ (access to financial market), $RISK_{it}$ (firm risk), $SIZE_{it}$ (firm size), DIV_{it} (industrial diversification), $INDUSTRY_{it}$ (industry effect), $GROWTH_{it}$ (investment growth), LEV_{it} (leverage), $TIME_{it}$ (dummy time), and $CRISIS_{it}$ (dummy crisis). While η_i is an unobserved firm-specific term and ε_{it} is an error term. H_2 states that a signifi-cant positive relationship is expected between interest rate derivatives and firm value.

This study employs the Two-Stage Least Square (2SLS) approach to investi-gate the relationship between interest rate derivatives and firm value. The 2SLS approach is used to cater to small samples when T is bigger. The 2SLS regres-sion is employed in this study because of the small number of observations and limited availability of interest rate derivatives data after filtering the derivatives process. The uses of the GMM estimator in small samples presented many prob-lems in estimating and diagnostic testing (Abdul Bahri et al., 2018). Baum (2006) states that 2SLS is no more than the estimator with a decision rule that reduces the number of instruments to the exact number needed to estimate the equation. He also mentioned that this estimator is an unbiased estimator in small sam-ples. To address the endogeneity issue in small samples, especially interest rate derivatives, 2SLS regression was used to solve this problem. This study performs several diagnostics to test the validity, consistency, biasness and efficiency that

consists of Anderson Canonical Correlation LM Statistic, Cragg-Donald, Stock Yogo critical issue, the Sargan test, and the Wu-Hausman Test. The Anderson Canonical Correlation LM Statistic is a test of under-identification in the matrix rank. The null hypothesis of this test is that the instruments are valid in the sense of the matrix to reduce the form coefficient has on rank (under-identified). The second diagnostic test of 2SLS is the Cragg-Donald test. This test is to test the weak identification test. If Cragg and Donald (1993) static (multivariate version of the Wald F-statistic) is larger than Stock and Yogo's (2005) critical value, it means that the null hypothesis is weakly identified and it is rejected. Stock and Yogo (2005) stated that the critical value depends on the number of endogenous regressors, the number of instruments, the maximum bias, and the estimation procedure. The third diagnostic test for 2SLS is Sargan test. This test is for over-identification test of all instruments whether there is an existence of exogenous instrument or not. The null hypothesis for this test is that the instruments are valid if over-identification for all instruments is rejected and lastly Wu-Hausman test for endogeneity test. The null hypothesis is rejected if the over-identification for all instruments are valid. Therefore, all tests (Anderson Canonical Correlation LM Statistic, Cragg-Donald, the Sargan test, and the Wu-Hausman Test) are to confirm the validity of instrumental variables.

Empirical analysis and discussions

Table 17.1 presents the descriptive statistics of the variables used in this study. The sample comprises 59 non-financial Sharī 'ah-compliant firms from the main market of Bursa Malaysia. First, the mean for Tobin's Q is 1.0851 (SD 0.8989) implying that the firms are profitable, on average. The mean of foreign currency

Table 17.1 Summary of descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
Tobin's Q	1,043	1.0851	0.8989	0.0000	9.6898
FCD	477	35.4748	84.6637	0.0009	953.4154
IRD	111	13.0232	48.3115	0.0128	466.8995
MO	1,052	0.0811	0.1384	0.0000	0.8194
ACCESS	1,062	0.8386	0.3770	0.0000	1.0000
RISK	1,054	0.3653	0.2257	0.0731	3.5968
SIZE	1,044	13.5857	1.7561	6.8690	18.7867
DIV	1,042	0.1452	0.1036	0.0054	0.7336
INDUSTRY	1,045	3.1477	0.8378	-0.0700	14.4083
GROWTH	1,035	0.0947	0.1889	0.0005	3.6880
LEV	830	0.2783	0.3874	3.4200	4.6432
DUMMY_TIME	1,062	0.3333	0.4716	0.0000	1.0000
DUMMY_CRISIS	1,062	0.1111	0.3144	0.0000	1.0000

Notes: Tobin's Q is a measurement for firm value; FCD is foreign currency derivatives (notional value/total asset); IRD is interest rate derivatives (notional value/total asset); MO is managerial ownership (total shareholding (direct) owned by managers.

derivatives is 35.4748 with SD of 84.6637. The mean of interest rate derivatives is 13.0232 with SD of 48.3115 and the mean for managerial ownership is 8.11% (SD 13.84%). The mean (SD) of access to financial market is 0.8386% (37.70%). The mean for firm risk shows 36.53% (SD 22.57% denoting lower risk for the firms. The mean reported for firm size is 13.5857 with SD of 1.7561, whereas the mean for industrial diversification is 0.1452 (SD 0.1036). The mean for industry effect is 3.1477 with the SD of 0.8378 and the mean for investment growth is 9.47 percent (SD 18.89%). Next, the mean for leverage is 27.83% (SD of 38.74%). Lastly, the mean for dummy time is 0.3333 (SD 0.4716) and the mean for dummy crisis is 0.111 with SD of 0.3144. This study also reports the correlation coefficient between the independent variables as in Table 17.2, indicating that the multicollinearity problem is not a concern due to low correlation coefficients between the independent variables; thus the model is not biased.

This study first presents Model (1) that examines the foreign currency derivatives and firm value through the two-step system GMM estimator. Model (2) presents the impact of interest rate derivatives and firm value by using 2SLS technique. At the bottom of Table 17.3, the diagnostic tests are reported; there is no issue of the validity of the instruments and autocorrelation in the residuals. Based on the Hansen test, the null hypothesis is not rejected; hence, the instruments are valid. Furthermore, the AR (1) and AR (2) tests expose the absence of autocorrelation in the model. Meanwhile, at the bottom of Table 17.4, the diagnostic tests are reported to confirm the validity, consistency, bias, and efficiency based on the Anderson Canonical Correlation LM Statistic, Cragg-Donald, Stock Yogo critical issue, the Sargan test, and the Wu-Hausman test. The Sargan test does not reject the over-identification restriction, recommending that this study has valid instruments. The Anderson LM statistic is tested for validity instruments; then for the regression model, the hypothesis that the instruments are not valid is rejected at the 5% level. The weak identification test, measured by Cragg-Donald Wald F-Statistic and the endogeneity test, as measured by the Durbin-Wu-Hausman test, also confirm the validity of the variables.

The result from Table 17.3 provides evidence on the positive relationship between foreign currency derivatives and firm value. As seen in Table 17.3, the coefficient of foreign currency derivatives is 0.0483 and is positively significant (p<0.05). This finding therefore provides evidence that a positively significant relationship exists between foreign currency derivatives and firm value of Sharī ʿah-compliant firms, consistent with the findings of Allayannis and Ofek, 2001; Bartram et al., 2011; Chong et al., 2014; Bhagawan and Lukose, 2017; and Tanha and Dempsey, 2017. This positive relationship suggests that Sharī ʿah-compliant firms in Malaysia involved in hedging used foreign currency derivatives, resulting in higher performance of the firm. This finding provides evidence on the effective risk management via derivatives adopted by the firm; hence, increasing firm value. The positive relationship could be due to several reasons; firstly, firms use derivatives to hedge risk exposure and financial volatility (Lau, 2016); secondly, firms with higher risk use more derivatives instruments to hedge risk since the

Table 17.2 Correlation coefficients among independent variables

	Tobin's Q	FC	IR	ACCESS	MO	RISK	SIZE	DIV	INDUSTRY	GROWTH	LEV	TIME	CRISIS
Tobin's Q	1.0000												
FCD	−0.0653	1.0000											
IRD	0.1455	0.2154	1.000										
ACCESS	0.1837*	−0.0643	0.0618	1.000									
MO	−0.1636*	0.0319	−0.0327	−0.0728*	1.0000								
RISK	−0.2980*	0.1605*	−0.0564	−0.4380*	0.1914*	1.0000							
SIZE	0.2579*	−0.1974*	−0.1741	0.2586*	−0.2349*	−0.4380*	1.0000						
DIV	−0.0233	0.0239	0.2748*	0.1433*	−0.0043	−0.0776*	0.1771*	1.0000					
INDUSTRY	0.3669*	0.0976*	−0.1597	0.0700*	0.0561	0.2486*	−0.3707*	0.1637*	1.0000				
GROWTH	0.0252	−0.0666	0.0764	0.0875*	−0.0927*	−0.0154	0.0982*	0.1087*	−0.0429	1.0000			
LEV	0.0103	0.0387	−0.1629	−0.0747*	−0.0694*	−0.0095	0.2479*	0.1374*	−0.0412	0.1050*	1.0000		
TIME	0.0724*	0.0534	−0.0583	−0.0124	−0.0062	−0.2045	0.1877*	−0.2058*	−0.4226*	−0.0276	−0.0503	1.0000	
CRISIS	−0.0086	−0.0590	−0.0736	0.0097	−0.0200	0.1504	0.0029	−0.0159	0.0211	−0.0161	−0.0008	−0.2500*	1.0000

Note: * represents the significant at level $p<0.05$

Table 17.3 Regression results of foreign currency derivatives
(two-step system GMM)

	Model 1
Tobin's Q (-1)	0.566***
	(28.79)
FCD	0.0483***
	(2.65)
MO	-0.0380***
	(-4.53)
ACCESS	0.0956
	(1.36)
RISK	-0.710***
	(-5.90)
SIZE	-0.0719***
	(-2.69)
DIV	-0.987***
	(-6.15)
INDUSTRY	-0.0760*
	(-1.66)
GROWTH	-0.196
	(-0.65)
LEV	0.641***
	(7.55)
DUMMY_TIME	-0.270***
	(-6.90)
DUMMY_CRISIS	-0.108***
	(-3.71)
Constant	1.824***
	(3.52)
No. of observations	303
No. of instruments	42
No. of Groups	47
AR (1)	0.016
AR (2)	0.480
Hansen Test	0.610

Notes: *, **, *** represent the significance at level $p<0.1$, $p<0.05$, $p<0.01$; *t*-statistic is in bracket; Tobin's Q is a measurement for firm value; FCD is foreign currency derivatives (notional value/total asset); MO is managerial ownership (total shareholding (direct) owned by managers over the total common shares outstanding), ACCESS is access to financial market (firm that pays dividend in the present year equals to "1" and "0" otherwise); RISK is firm risk (average standard deviation of daily stock returns on the previous year and then annualized to yearly return); SIZE is firm size (natural logarithm of total assets); DIV is industrial diversification (HH Index); INDUSTRY is industry effect (constructs the industry-adjusted Tobin's Q, then computes the log difference between the weight-adjusted industry Q and multi-segment for each firm); GROWTH is investment growth (ratio of capital expenditure to sales) and LEV is leverage (long-term debt divided by total shareholder's equity); DUMMY_TIME is following the MFRS guideline, from year 2000 to 2011 equals "0" and 2012 to 2017 equals "1"; DUMMY_CRISIS is in which the crisis years (2007 and 2008) are categorized as "1" while the non-crisis year (other years) as "0".

Table 17.4 Regression results of interest rate derivatives – Two-Stage Least Square (2SLS)

	Model 2	
	2SLS-FE	2SLS-FD
Tobin's Q (-1)	0.156***	-0.0978*
	(3.08)	(-1.70)
IRD	-0.0186	0.0119
	(-0.75)	(0.37)
MO	-0.0195	-0.0474*
	(-1.10)	(-1.88)
ACCESS	-0.00161	0.0753
	(-0.02)	(1.06)
RISK	0.206	0.315**
	(1.46)	(2.31)
SIZE	-1.071***	-1.459***
	(-13.41)	(-14.67)
DIV	0.469**	0.135
	(1.99)	(0.37)
INDUSTRY	-1.116***	-1.214***
	(-14.52)	(-14.20)
GROWTH	0.339	-0.894***
	(1.33)	(-2.96)
LEV	0.0001	0.0165
	(0.00)	(0.11)
DUMMY_TIME	-0.0177	0.0272
	(-0.65)	(0.78)
DUMMY_CRISIS	-0.0848	-0.114*
	(-1.69)	(-1.86)
No. of observations	68	54
R-squared	0.8852	0.8747
Anderson LM statistic	0.0005	0.0004
Cragg-Donald Wald F-Statistic	6.443	6.747
Durbin-Wu-Hausman Test	0.1332	0.8722
Sargan Test	0.1156	0.1355

Notes: *, **, *** represent the significance at level $p<0.1$, $p<0.05$, $p<0.01$; *t*-statistic is in bracket; Tobin's Q is a measurement for firm value; IRD is interest rate derivatives (notional value/total asset); MO is managerial ownership (total shareholding (direct) owned by managers over the total common shares outstanding), ACCESS is access to financial market (firm that pays dividend in the present year equals to "1" and "0" otherwise); RISK is firm risk (average standard deviation of daily stock returns on the previous year and then annualized to yearly return); SIZE is firm size (natural logarithm of total assets); DIV is industrial diversification (HH Index); INDUSTRY is industry effect (constructs the industry-adjusted Tobin's Q, then computes the log difference between the weight-adjusted industry Q and multi-segment for each firm); GROWTH is investment growth (ratio of capital expenditure to sales) and LEV is leverage (long-term debt divided by total shareholder's equity); DUMMY_TIME is following the MFRS guideline, from year 2000 to 2011 equals "0" and 2012 to 2017 equals "1"; DUMMY_CRISIS is in which the crisis years (2007 and 2008) are categorized as "1" while the non-crisis year (other years) as "0".

firm tends to generate profit and having economies of scale also encourages firm to exercise foreign currency derivatives. Chong et al. (2014) mentioned that no firm can avoid encountering risk and hedging is a complementary strategy to mitigate risk facing the firms. This finding is in support of the hedging theory, stating that firms that expose to risk are more likely to use derivatives to increase firm performance. This supports the argument that Sharīʿah-compliant firms are equipped in risk management (Baber, 2018; Mitchell, 2010; Nafis and Mohammad Shadique, 2016). Furthermore, during the financial crisis, Islamic finance is more resilient to face economic uncertainties compared to conventional finance (Nafis and Mohammad Shadique, 2016; Baber, 2018). Based on this supportive argument it also supports the hedging theory from an Islamic perspective. Thus, the finding confirms that foreign currency derivatives have a positive relationship with firm value and H_1 is supported. Meanwhile, all the control variables include managerial ownership, access to financial markets, firm risk, firm size, industrial diversification, industry effect, investment growth, leverage, time, and year crisis are statistically significant.

Table 17.4 for Model (2), which focuses on interest rate derivatives, shows that interest rate derivatives are statistically insignificant to firm value (Tobin's Q) for both 2SLS-FE and 2SLS-FD. Besides, most of the control variables are insignificant to Tobin's Q. This finding hence does not confirm the expected hypothesis. This finding also contradicts Bartram et al.'s (2009) finding, but is consistent with the findings on interest rate derivatives by Ayturk et al. (2016) and Jin and Jorion (2006). The possible reason could be due to (i) 23.6% Malaysian listed firms have significant foreign currency exposures from 2014 to 2016; thus, foreign currency derivatives is mostly used to hedge firms' risk exposure compared to interest rate derivatives and commodity derivatives (Hong et al., 2018) and (ii) Bank Negara also reported that the foreign currency market keeps on growing over the years with foreign currency derivatives being the most used instruments in the Malaysian market. Thus, interest rate derivatives are insignificant to firm performance of Sharīʿah-compliant firms, as they are less engaging in derivatives.

Robustness test

This study performs a robustness test to check for the consistency of the result (Tobin's Q) with alternative measurements of firm value (ROA and ROE). Table 17.5 reports the results for alternative measurements of foreign currency derivatives (ROA and ROE). Model 3 and Model 4 for foreign currency derivatives show significant positives with ROA and ROE (p<0.01), consistent with Tobin's Q. Table 17.6 reports the results for alternative measurements of interest rate derivatives (ROA and ROE). Model 5 and Model 6 for interest rate derivatives show insignificant ROA and ROE (p<0.01), consistent with Tobin's Q. The results based on ROA and ROE therefore are consistent with Tobin's Q, both for the foreign currency and interest rate derivatives.

Table 17.5 Robustness test for foreign currency derivatives (ROA and ROE)

	ROA	ROE
	Model 3	Model 4
Tobin's Q (-1)	0.544***	0.675***
	(9.88)	(20.84)
FCD	0.0013***	0.0209***
	(2.92)	(3.41)
MO	-0.0023**	-0.00464***
	(-2.46)	(-2.59)
ACCESS	0.0133***	-0.0184
	(3.15)	(-1.23)
RISK	0.0190 ***	0.0753***
	(2.71)	(5.51)
SIZE	-0.0026	-0.000167
	(-1.07)	(-0.02)
DIV	0.110***	0.195***
	(7.25)	(4.96)
INDUSTRY	-0.0202 ***	-0.00870
	(-4.47)	(-0.79)
GROWTH	0.0438	0.0837
	(0.90)	(1.18)
LEV	-0.0455***	0.0491***
	(-3.10)	(2.69)
DUMMY_TIME	-0.0038	0.0118
	(-0.80)	(1.08)
DUMMY_CRISIS	0.0083***	0.0143
	(3.36)	(1.38)
Constant	0.0881**	-0.0283
	(2.23)	(-0.24)
No. of observations	312	312
No. of instruments	43	42
No. of Groups	47	47
AR (1)	0.024	0.036
AR (2)	0.781	0.310
Hansen Test	0.800	0.813

Notes: *, **, *** represent the significance at levels p<0.1, p<0.05, p<0.01; *z*-statistic is in parenthesis; ROA is Return on Total Asset (Net Profit over Total Asset); ROE is Return on Total Equity (Net Profit over Total Equity).

Conclusion, limitations, and future research

This study examines the relationship of foreign currency and interest rate derivatives on firm value of Sharīʿah-compliant firms, controlling for managerial ownership, access to financial market, firm size, leverage, firm risk, industrial diversification, industry effect, investment growth, time, and year crisis. The results of the study are robust, based on first, the various measurements of firm value (Tobin's Q, ROA and ROE), second, the use of system-GMM estimator and third, 2SLS technique. This study concludes that foreign currency derivative

Table 17.6 Robustness test for interest rate derivatives (ROA and ROE)

| | ROA | | ROE | |
| | Model 5 | | Model 6 | |
	2SLS-FE	2SLS-FD	2SLS-FE	2SLS-FD
Tobin's Q (-1)	-0.200*	-0.462***	-0.286*	-0.697***
	(-1.79)	(-4.01)	(-1.85)	(-4.06)
IRD	-0.00872	-0.000335	0.0300	-0.00220
	(-0.55)	(-0.02)	(1.33)	(-0.04)
MO	0.0223	0.0185	-0.0244	0.0176
	(1.57)	(1.11)	(-1.42)	(0.55)
ACCESS	-0.103*	0.0461	0.192***	0.379***
	(-1.85)	(1.07)	(2.97)	(4.53)
RISK	-0.692***	-0.0667	-0.115	0.0931
	(-4.46)	(-0.83)	(-0.94)	(0.42)
SIZE	-0.257***	-0.145**	-0.246***	-0.151
	(-4.63)	(-2.33)	(-4.13)	(-1.28)
DIV	0.165	-0.185	-0.164	-0.107
	(0.70)	(-0.86)	(-0.75)	(-0.22)
INDUSTRY	-0.179***	-0.0594	-0.138**	-0.251***
	(-3.34)	(-1.15)	(-2.06)	(-2.98)
GROWTH	0.427**	0.0557	-0.280	-0.725**
	(2.12)	(0.31)	(-1.22)	(-2.38)
LEV	-0.145**	-0.163*	-0.0849	0.0844
	(-2.23)	(-1.68)	(-0.90)	(0.54)
DUMMY_TIME	-0.0275	0.00450	0.0387	0.0393
	(-1.20)	(0.22)	(1.64)	(0.93)
DUMMY_CRISIS	0.139**	0.0203	-0.0862	0.173
	(2.53)	(0.42)	(-1.62)	(1.54)
No of observations	45	52	65	30
R-squared	0.6526	0.4649	0.5402	0.7816
Anderson LM statistic	0.0000	0.0015	0.0000	0.0014
Cragg-Donald Wald F-Statistic	15.805	5.665	10.425	6.352
Durbin-Wu-Hausman Test	0.2827	0.1208	0.3531	0.7688
Sargan Test	0.3305	0.8845	0.1815	0.1909

Notes: *, **, *** represent the significance at levels p<0.1, p<0.05, p<0.01; *z*-statistic is in parenthesis; ROA is Return on Total Asset (Net Profit over Total Asset); ROE is Return on Total Equity (Net Profit over Total Equity).

significantly contributes to firm value of Sharīʿah-compliant firms. However, interest rate derivatives report insignificant influence to firm value.

The current study is not exhaustive in the sense that its sample is limited to only 59 Sharīʿah-compliant firms engaging in derivatives during the study period. Due to this constraint, it may cause limitations on generalization of the results and representation of the whole population. The result also shows that managerial ownership is statistically significant with firm performance for

firms that engaged in derivatives for risk management. Hence, in addition to that, future research could also investigate the role of managerial ownership on hedging decisions and its implication on firm performance. The context of the study can be extended to the effect of derivatives on performance between the Sharīʿah and non-Sharīʿah-compliant firms in Malaysia. Besides, this study may be extended to other countries around the world that offer both Sharīʿah and non-Sharīʿah-compliant investments. Overall, this study has important implications for managers, investors, and policy makers. First, the importance of risk management via derivatives is to increase firm value. Second, the quality reporting on derivatives engagement by firms is in line with the required accounting standard.

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