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Evaluating the Role of Innovative Technologies in China's Financial Inclusion Milestone

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Abstract: The digital revolution has fostered financial inclusion and China has achieved remarkable success in this journey by leveraging technologies such as internet and mobile phones. This study aims to evaluate the role of technology, in terms of Internet, Big data and Machine Learning, in driving digital financial inclusion in China with reference to existing literatures. It is concluded that technologies merely act as supporter and facilitator of the financial development and inclusion, while the key player remain with the government. This study highlights the problems attached to the digital finance in China, and the how the government could play a role to address such issues. It is concluded that while innovative technologies accelerate the process of financial inclusion, it is crucial to invest in digital literacy and connectivity to close the access gaps to financial services. As this study mainly focus on Internet and fintech, future research is recommended to evaluate how the Regulatory Technology (RegTech) and Block-Chain Technology in mitigating financial risks and uncertainties and whether digital yuan has a significant impact on financial inclusion since the research on this topic area is limited.

Key words: financial inclusion, fintech, digital finance, microlending, innovative finance
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1. Introduction

Financial inclusion is one of the world's most pressing issue as the World Bank estimates that 1.7 billion adults, approximately 33% of the total adults are remained unbanked (Kunt et al., 2018). Inequalities in access to financial services is the main cause of this problem. While the vast majority of people in developed economies enjoy the benefits of modern financial services, these services are found unavailable or restricted to those who can afford them in many parts of the world, particularly in developing economies. This is a major barrier to economic and social progress. The causes of financial exclusion include the inability to access financial services, the inability to afford financial services, and inappropriate use of financial services. Fortunately, financial services providers and the government have made an effort to leverage their available resources and authorities to extend the number of people who can benefit from these services. A recently published journal regarding the overview of financial inclusion in China by Chen &Yuan (2021) inspired this study to critically analyze the role of innovative technologies in China's financial inclusion milestone. Section 2 will provide a brief background, definition, concepts, importance of financial inclusion, government intervention, and achievement of China's financial inclusion. Section 3 will explain the types of research and source of information for this study. Section 4, the

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discussion will evaluate the role of technologies such as the Internet, machine learning and big data analytics, and Biometrics in facilitating and supporting China's financial inclusion.

2. Literature Review

2.1 Financial Inclusion

Financial inclusion, also known as inclusive finance, is construed as the availability and equality of opportunities for individuals and businesses to access appropriate financial services that encompass risk management products, payments, savings, credit, and transactions (Chen & Yuan, 2021; Nanda & Kaur, 2016). Financial inclusion aims to widen the available financial services coverage to the unbanked population or excluded groups in the financial system, which eventually evolves and facilitates a country's financial development (Laeven et al., 2015). Previous works of literature contribute several studies in identifying the impacts of financial inclusion. Financial inclusion is positively significant and has a long-run relationship with stimulating a country's economic growth, especially in remote and rural areas (Kim et al., 2018; Sethi & Acharya, 2018). Dupas & Robinson (2013) claimed that financial inclusion significantly impacts individuals' employment, consumption, and production. A recent research also supported the findings and indicated that it is an important resolution in poverty reduction and closing the income inequality gap (Neaime & Gaysset, 2018; Cumming et al., 2016). Financial inclusion could be measured and evaluated through index systems with three bases: Access, Awareness and Use (Chen & Yuan, 2021; Espinosa-Vega et al., 2020). *Access* refers to the supply of the available financial services whereby the accessibility and reach of the services are utilized to evaluate the national financial inclusion coverage. On the other hand, *awareness* refers to the demand for financial services, which is the number of financially literate individuals who wish to make a financial decision that encourages financial well-being. Lastly, *Use* refers to the usage and consumption of financial services. Other than the three bases mentioned above, studies has shown that the development of financial inclusion is highly determined by macro perspectives and socioeconomic factors, including economic growth, population, social stability, and legal systems (Lopez and Winkler, 2018). Individual characteristics could also influence an individual financial inclusion (Ali, 2019). For example, marital status, age (Nguli & Mukoswa Odunga, 2019) and social status (Shihadeh, 2018) was found to have a negative and significant effect on financial inclusion, while level of education has a positive and significant effect on financial inclusion (Nguli & Mukoswa Odunga, 2019; Shihadeh, 2018).

2.2 Financial Inclusion in China

According to China's Plan for Advancing the Development of Financial Inclusion (2016-2020), China's authorities defined *financial inclusion* as providing financial services for all social strata and groups with appropriate and valid financial services, at an affordable cost, based on the principle of opportunity equality and commercial sustainability (People's Bank of China & World Bank Group, 2018). Although researchers agreed that China has achieved a comfortable level of financial inclusion (Tsai, 2017; Fungáčová & Weill, 2015), millions of unbanked adults in China are still found to be marginalized in the current system hence the room for eradicating financial exclusion remains. Financial inclusion practices are still required to cater to the unserved and underserved populations or groups. Chen & Yuan (2021) commented that China has rich experience in inclusive financial systems and its practices have seen developed toward a sustainable path. It is reflected in the nation's financial inclusion plan (2016-2020) that seeks to deepen financial reforms to serve the historically unserved and underserved groups (i.e., Small and micro businesses, urban low-income groups, the disabled, the aged and other

special groups) better. China's achievement in financial inclusion today is highly attributed to the arduous efforts of past decades. Although few parties contribute to China's financial inclusion today, the main driver is the government who establish various guidelines and policies to encourage the bank sectors, fintech startups, and non-bank companies to utilize the innovative technologies in delivering the financial services to the underserved and unserved populations. Hence, it is sufficient to say that the government are the root cause of the series of actions and results. Below will provide a brief overview of China's financial inclusion milestones and the significance of policy guidance for Chinese banking financial institutions in the commitment to promoting financial inclusion.

The turning point in China's financial inclusion happened since the government approach changed from the reforms of Rural Credit Cooperatives (RCCs) and policy banks to the deployment of agent banking models in 2005 (People's Bank of China & Word Bank Group, 2018; Sparreboom & Duflos, 2012). The reform was mainly due to the social inequalities between the large industrial, government-owned companies and vulnerable groups where new policies were required to achieve social harmony and sustainable development. The central government embarked on a concerted effort to cater for the financial exclusion issues. Some of the initiatives taken including the China Banking Regulatory Commission (CBRC) introduced guidelines and regulations that prioritize the four difficult groups (i.e., rural households, low wage workers, micro-small-or-medium enterprises, unemployed and laid-off workers) to the access to banking services such as basic financial services and credit for enterprise investment purpose. In 2005, guidelines were issued to encourage banks, regardless of their size, to set up small business units in rural or remote areas to ensure the availability of minimal financial services in the townships and villages all around China so as to reach the underserved and unserved better. CBRC thus issued policy documents that intend to reduce the registration requirements of rural financial institutions and consequently lead to a significant increase in the number of banking outlets. The increase in financial services coverage establishes massive access points (i.e., ATMs, banking agents, and POS devices). Other than that, the credit of SMEs was supported by the banks after the government issued subsequent guidelines and policies from 2015 to 2011, most notably was, high incentives were given to the local banks that offer loans to small enterprises. Apart from that, the government interventions (i.e., pilot test of Micro Credit Companies) have contributed to the diversity of financial services available in rural finance that specifically target the underserved and unserved groups' needs.

With the emergence of digital technology, it is found that a vast number of non-bank providers and fintech startups offer financial services (i.e., loans, digital payments, credit and insurance) to promote financial inclusions. The government adopted the "wait and see" approach and tolerated those non-bank services providers targeting SMEs, with the ground rules of appropriate interest rates and deposit mobilization (Chen & Yuan, 2021; People's Bank of China & Word Bank Group, 2018; Tsai, 2017). This gives rise to the rapid expansion of China's digital financial inclusion, drastically improving the accessibility and affordability of financial services in serving the underserved and unserved. It was eventually contributing to the national economic growth (Ahmad et al., 2020). It is suggested that the foresight of China's government that encouraged technology adoption in the finance industry has enabled China to become one of the global leaders (another is India) that reached 87% of financial technology (FinTech) adoption rate in a study across 27 countries (EY, 2019).

3. Methodology

This study is conducted through documentary research whereby secondary data includes journals, statistics, whitepapers, articles and reports. This study accesses the China's statistics report, government policies reports, World Bank database, People's Bank of China's reports, world-recognized consulting firms (Ernst & Young and Deloitte) 's reports and articles, and credible journals from publishing companies (i.e., Elsevier, Emerald, Sage, China Economic Review, Applied Economics Letter and Springer). This research evaluate existing literature arguments, and provide a personal opinion regarding the role of innovative technologies in China's financial inclusion. Unfortunately, there is a lack of information and published documents regarding some innovative technologies such as RegTech and Blockchain in China, hence this study would only discuss technologies such as the Internet, Biometrics, big data analytics and machine learning. The authors of the documents adopted was credited correctly for the reader's convenience and acknowledged the researcher's ideas.

4. Discussion

Chapter 2 has discussed financial inclusion generally. This chapter will specifically evaluate how innovative technologies, in terms of internet, big data and machine learning, contribute to the China's financial inclusion milestone.

4.1 Internet (Digital Finance) — The Enabler of Fintech Revolution

The Internet encourages innovation for the entrepreneur to start a new business model hence benefiting the society by providing many more convenient and highly accessible financial services. In the internet revolution, China fully leverages its resources to adopt itself to maximize the benefit of digitalization and eventually endured rapid development in developing the digital economy and digital finance (Ahmad et al., 2020). Internet could be the most prominent trend that has boosted the growth of China's financial inclusion and opened up the entrance toward digital financial inclusion. The Internet plays an essential role in overcoming the limitations of traditional brick and mortar bank institutions that prefer to be located in densely populated urban areas, which leaves those excluded groups unable to access financial services and products. The internet revolution disrupted the traditional bank operation model. It contributed to the rise of digital finance, which offers diverse and convenient financial products and services such as digital payment, online remittances, P2P platforms, online loans, online insurances, etc. Taking peer-to-peer (P2P) lending platforms as an example, the concept of this online model is a platform that pools the entrepreneurs (businesses) and private individuals or retail investors to enable funding and investing functions. The P2P platforms have seen exponential growth since 2007 and reported numbers of 5,029 platforms which have over RMB1.09 trillion (US$162 billion) loans outstanding (Tsai, 2017). It has effectively catered the SMEs or startups' funding difficulties in traditional bank institutions while also providing the private individuals or investors with a better return (compared to saving deposits in banks, 1.5% p.a.). However, the government's "wait to see" approach has been abused by the public, be it the lender or borrower. The lax regulations on microlending has led to social issues in which P2P platforms, e.g., Jiedaibao.com, use nude photos as collateral for female college students' loans and threaten them by making their photos public when they are unable to make payments (Liu & Keane, 2020). Other than naked loans, another two types of illegal usury crimes, i.e., campus loan and recipe loan also attract public concern and criticism on the digital financial inclusions (Li et al., 2021). Examining the landscape of China's financial inclusion journey, it is opined that the Internet merely plays a

supporter role by stimulating various innovative business models such as P2P platforms, online loans, online remittances and others, the misuse and abuse of technology is inevitable, hence requires government's intervention in enforcing the rules and regulations against these non-bank finance providers.

In addition to stimulating innovative business model, the Internet also opens a competitive market between the two tech giants in China and urges them to provide better services to the citizen to capture market share. Agarwal et al. (2020) indicated that the technology giants in China, Alibaba and Tencent have contributed significantly to driving the national financial inclusion and FinTech revolutions. They benefitted from its visionary leadership and technological capabilities. These two companies transformed themselves into conglomerates that expanded their business to various sectors such as e-commerce, finance, social media, etc. Alibaba and Tencent's third-party payment services, Alipay and WeChat Pay, respectively contribute significantly to shifting China's payment method from cash to a digital payment system that is relatively convenient and highly accessible to consumers. The benefits provided direct Alipay and WeChat Pay to own a vast customer base with over 475 million and 600 million subscribers (Tsai, 2017). In addition, China Internet Network Info Center reported that 633 million users made online payments in 2019 through Alipay and WeChat, which had seen a significant increase in 2018 (CNIC, 2019). Moreover, due to the competition between two tech giants, the wealth management services (Zhaocaibao & Licaitong), online banks (Mybank and Webank), and credit score systems (Sesame/Zhima Credit & Tencent Credit) were introduced to consummate their financial service coverage. The underserved and unserved groups could quickly and completely access financial services at ease with the assistance of technologies, especially in obtaining a loan (Li et al., 2019).

Combining the fact that there are accumulated over one billion people in China access the Internet through mobile devices and the significant increase in internet penetration rate in rural areas from the year 2014 to 2021 (Thomala, 2022), it is believed that the majority of underserved and unserved groups are currently able to enjoy the benefits of inclusive finance. This is supported by Cao (2018) which found that 81% of the respondent (121,000 rural families) have used banking products and financial services, incredibly familiar with digital payment apps, Alipay and WeChat pay. Online access is the ideal medium to reach a large customer base across the nation. Although China's online penetration is desirable, it does not mean that internet usage will direct to a higher financial inclusion. As per the 41st China Statistical Report on Internet Development (2017), only 16.5% of 772 million internet users use the Internet for financial management (Beckett & Ge, 2018). Studies indicated that internet could only promote financial inclusion to the excluded groups indirectly by introducing digital financial products, the more appropriate approach to maximize the positive impacts led by the internet revolution in financial inclusion is to enhance financial literacy and improving the nation's financial capability and knowledge (Shen et al., 2019; Turvey & Xiong, 2017).

To conclude on this part, the Internet does provide a new option or approach to China's financial inclusion in terms of access and quality of financial products/services. However, the Internet is not a panacea to improve the awareness (financial literacy, financial capabilities and knowledge) and is unable to prevent social issues happening (naked loans), it requires the government to enforce the rules and regulations and ensure the use(benefits) of the Internet are reasonably maximized to the society.

4.2 FinTech-Big Data & Machine Learning

Innovative technologies such as big data analytics and machine learning have lowered the threshold for the excluded group to access credit and obtain loans. In fact, studies reveal that more than half of China's population

lacks credit history to loans from formal financial institutions (Chorzempa et al., 2018). However, with the emergence of digital financial inclusion in China, financial sectors have adapted to the disrupting technologies to innovate new financial products to cater to the excluded groups' needs (Zhang et al., 2020). For example, ICBC introduced the "Corporate Easy Loan" for MSEs, which assessed creditworthiness through big data analysis (People Bank of China & World Bank Group, 2018). Similar cases were happening in the financial companies where an AI-based scoring system was deployed to optimize the credit assessment by considering more variables and delivering services to the excluded groups who have no credit history. Individuals' and MSE's repayment abilities were not limited to a few variables. Variables such as the purchasing behaviours, living costs, average salaries of a particular age and others were considered during the modelling process (machine learning) to ensure a nuanced data evaluation. Online banks in China as mentioned above, the WeBank and MYbank, subsidiaries companies from the two tech giants, have the advantage in implementing this new credit evaluation system compared to the traditional banking institutions. This is because both online banks have a large customer base and transactional data shared by their parent companies, hence the massive amount of individuals' data is more easily accessed and ensures the reliability of the data models formed. Consequently, individuals without credit history could still generate credit records when they conduct payments through WeChat Pay and Alipay (Zhang et al., 2020). It is viewed that the technologies have benefited the underserved group in traditional finance and credit scoring systems (scorecard approach) by lessening the credit constraint hence enabling them to venture into business. It is supported by the research which indicated that digital finance's positive significant effect on entrepreneurship is high among rural residents compared to urban residents as the latter already have access to the fund (Zhang et al., 2020). It is opined that in the application of big data analytics and machine learning, technology companies can collect data through the existing customer networks instantly and leverage the technologies to deliver a brand-new creditworthiness assessments model. It is also believed that the new credit evaluation system would enable the financial institutions to make a more accurate decision on approving the credit and have better control in risk management (reducing credit losses) (Mehdi et al., 2019).

Biometrics plays the role of providing a relatively secure environment and breaking the barriers of the excluded groups. According to Visa (2019), biometrics refers to the unique, intrinsic characteristics that can be used to identify or verify an individual's identity. The prevalence of fingerprint and facial recognition technologies has dramatically impacted individual norms. The most significant contribution of Biometrics is to enhance security through identification and authentication. Biometrics could assist the excluded groups, especially the uneducated and disabled people, use financial products (Patel, 2018). This is due to the use of Biometrics like fingerprints in financial transactions has simplified the entire process and writing processes such as inserting the passwords or PINs are eliminated. Nevertheless, it solves the financial accessibility of excluded groups who lack adequate government identification credentials. Unfortunately, this study could not find the data of number of people in China that do not have basic ID credentials, however, the fact that around one billion people around the world are still without ID credentials (World Bank, 2019) has sufficiently shown that how technology has decreased the threshold of financial inclusion for these groups. It is believed the incidents might also happen to the remote and rural villages in provinces such as Henan, Shandong, Sichuan, Guangdong and Hebei. Biometric identification overcomes the challenges of traditional identification in banking sectors, individuals that lack identification credentials in opening the formal bank accounts could benefit from the non-bank financial service providers such as Alipay and WeChat pay to meet basic financial needs. Biometrics technologies play the role in filling the gaps for the excluded group in identity authentication whereby populations with low educational levels

or disabled could enjoy using financial products easily once they have set up their Biometrics and the security of Biometrics is promising as it is uniquely personal and it is almost impossible to replicate.

Based on the discussion above, it is opined that the government played the enabler role in issuing policies that assist the promotion of financial inclusion while innovative technologies act as supporters and facilitators in the journey.

5. Conclusion

Throughout the discussion above, it is noted that the technologies have significantly contributed to China's financial inclusion through innovative technologies. Internet plays the role of enabler in digital financial inclusion and stimulates local innovative financial products development; Big data analytics and machine learning, supporter of financial inclusion through new credit evaluation system which lowered down the threshold in credit access and loan taking; Biometrics bridging the gap for vulnerable groups such as low-educational groups and disabled in accessing the basic financial services in a convenient and fast manner. Although these innovative technologies are seemingly contributing to the promotion of financial inclusion, they possess a higher risk of rising societal issues such as fraud and unethical practices (naked loans), if the issues remain unsolved, eventually, the sustainable growth of financial inclusion would be affected. It requires the cooperation between government authorities, financial institutions, technologies companies and fintech startups to work hand in hand in improving the overall financial infrastructure, financial literacy, financial products' quality, and business ethics to achieve sustainable financial inclusion in China. This study is limited to fewer technologies such as the Internet, big data, machine learning, and Biometrics due to the insufficiency of research in this topic area in China. Future researchers could probably study more on Regulatory Technology (RegTech) and Block-Chain Technology in mitigating financial risks and uncertainties. Direction on the Digital Yuan, which integrates Blockchain technologies and Biometrics, is encouraged to continually evaluate how innovative technologies play a game-changing role in China's future financial inclusion.

References

Agarwal S., Qian W. and Tan R. (2020). "Financial inclusion and financial technology", *Household Finance*, pp. 307-346, doi: https://doi.org/10.1007/978-981-15-5526-8_9.

Ahmad M., Majeed A., Khan M. A., Sohaib M. and Shehzad K. (2021). "Digital financial inclusion and economic growth: provincial data analysis of China", *China Economic Journal*, Vol. 14, No. 3, pp. 291-310, doi: https://doi.org/10.1080/17538963.2021.1882064.

Ali A. E. E. S. (2019). "Empowering women through financial inclusion: Some evidence from Comoros", *International Journal of Asian Social Science*, Vol. 9, No. 2, pp. 256-270, doi: https://doi.org/10.18488/journal.1.2019.92.256.270.

Beckett N. and Ge A. (February 26, 2018). "CNNIC publishes the 41st statistical report on China's Internet development in China", Lexology; China Internet Network Information Centre, available online at: https://www.lexology.com/library/detail.aspx?g=911ae57f-50da-4c53-ab75-2376272b2021#:~:text=According%20to%20the%20Report%2C%20up.

Cao C. (2018, July 2). "Report: Internet usage in rural communities on the rise", *China Daily*, available online at: https://www.chinadaily.com.cn/a/201807/02/WS5b3992b0a3103349141e01d2.html.

Chen W. and Yuan X. (2021). "Financial inclusion in China: An overview", *Frontiers of Business Research in China*, Vol. 15, No. 1, doi: https://doi.org/10.1186/s11782-021-00098-6.

Chorzempa M., Heller D., Hillebrand H., Lardy N., Lovely M., Posen A., Truman T. and Véron N. (2018). "POLICY BRIEF 18-1 China Needs Better Credit Data to Help Consumers", available online at: https://www.piie.com/system/files/documents/pb18-1.pdf.

CNIC (2019). "Statistical report on internet development in China", China Internet Network Information Center, available online at: https://www.cnnic.com.cn/IDR/ReportDownloads/201911/P020191112539794960687.pdf.

Cumming D., Rui O. and Wu Y. (2016). "Political instability, access to private debt, and innovation investment in China", *Emerging Markets Review*, Vol. 29, pp. 68-81, doi: https://doi.org/10.1016/j.ememar.2016.08.013.

Dupas P. and Robinson J. (2013). "Why don't the poor save more? Evidence from health savings experiments", *American Economic Review*, Vol. 103, No. 4, pp. 1138-1171, doi: https://doi.org/10.1257/aer.103.4.1138.

Espinosa-Vega M., Shirono K., Carcel Villanova H., Chhabra E., Das B. and Fan Y. (2020). "Measuring financial access", *Departmental Papers/Policy Papers*, Vol. 20, No. 8, doi: https://doi.org/10.5089/9781513538853.087.

EY. (2019). "EY Global FinTech Adoption Index 2019", Ey.com. https://www.ey.com/en_gl/ey-global-fintech-adoption-index

Fungáčová Z. and Weill L. (2015). "Understanding financial inclusion in China", *China Economic Review*, Vol. 34, pp. 196-206, doi: https://doi.org/10.1016/j.chieco.2014.12.004.

Kim D. W., Yu J. S. and Hassan M. K. (2018). "Financial inclusion and economic growth in OIC countries", *Research in International Business and Finance*, Vol. 43, pp. 1-14, doi: https://doi.org/10.1016/j.ribaf.2017.07.178.

Kunt A. D., Klapper L., Singer D., Ansar S. and Hess J. (2018). "The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution", World Bank Group, available online at: https://globalfindex.worldbank.org/#:~:text=About%201.7%20billion%20adults%20remain.

Laeven L., Levine R. and Michalopoulos S. (2015). "Financial innovation and endogenous growth", *Journal of Financial Intermediation*, Vol. 24, No. 1, pp. 1-24, doi: https://doi.org/10.1016/j.jfi.2014.04.001

Li D., Peng Z. and Xiong K. (2021). "Usury crimes in post-crisis China: The underlying economics and beyond", *Journal of Economic Issues*, Vol. 55, No. 4, pp. 1023-1033, doi: https://doi.org/10.1080/00213624.2021.1988628.

Li J., Wu Y. and Xiao J. J. (2019). "The impact of digital finance on household consumption: Evidence from China", *Economic Modelling*, doi: https://doi.org/10.1016/j.econmod.2019.09.027.

Liu J. and Keane H. (2020). "Naked loan selfies: Becoming collateral, becoming pornography", *New Media & Society*, Vol. 23, No. 12, pp. 3616-3633, doi: https://doi.org/10.1177/1461444820957257.

Lopez T. and Winkler A. (2017). "The challenge of rural financial inclusion — evidence from microfinance", *Applied Economics*, Vol. 50, No. 14, pp. 1555-1577, doi: https://doi.org/10.1080/00036846.2017.1368990.

Mehdi B., Hasna C., Ahmed E. K. and Tayeb O. (2019). "Intelligent credit scoring system using knowledge management", *IAES International Journal of Artificial Intelligence (IJ-AI)*, Vol. 8, No. 4, p. 391, doi: https://doi.org/10.11591/IJAI.V8.I4.PP391-398.

Nanda K. and Kaur M. (2016). "Financial inclusion and human development: A cross-country evidence", *Management and Labour Studies*, Vol. 41, No. 2, pp. 127-153, doi: https://doi.org/10.1177/0258042x16658734.

Neaime S. and Gaysset I. (2018). "Financial inclusion and stability in MENA: Evidence from poverty and inequality", *Finance Research Letters*, Vol. 24, pp. 230-237, doi: https://doi.org/10.1016/j.frl.2017.09.007.

Nguli J. ans Mukoswa Odunga R. (2019). "Individual characteristics and financial inclusion of women owned enterprises in Kenya", *IOSR Journal of Business and Management*, Vol. 21, No. 4, pp. 85-91.

Patel M. (October 8, 2018). "Biometric authentication: Bridging the gap for financial inclusion", *The Fintech Times*, available online at: https://thefintechtimes.com/biometric-authentication-financial-inclusion/.

People's Bank of China, & World Bank Group (2018). "Toward universal financial inclusion in China: Models, challenges, and global lessons", International Bank for Reconstruction and Development, The World Bank and the People's Bank of China, available online at: https://responsiblefinanceforum.org/wp-content/uploads/2018/04/FinancialInclusionChinaP158554.pdf.

Sethi D. and Acharya D. (2018). "Financial inclusion and economic growth linkage: Some cross country evidence", *Journal of Financial Economic Policy*, Vol. 10, No. 3, pp. 369-385, doi: https://doi.org/10.1108/jfep-11-2016-0073.

Shen Y., Hu W. and Hueng C. J. (2018). "The effects of financial literacy, digital financial product usage and internet usage on financial inclusion in China", *MATEC Web of Conferences*, doi: https://doi.org/10.1051/matecconf/201822805012.

Shen Y., Hueng C. J. and Hu W. (2019). "Using digital technology to improve financial inclusion in China", *Applied Economics Letters*, Vol. 27, No. 1, pp. 30-34, doi: https://doi.org/10.1080/13504851.2019.1606401.

Shihadeh F. H. (2018). "How individual's characteristics influence financial inclusion: Evidence from MENAP", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 11, No. 4, pp. 553-574, doi: https://doi.org/10.1108/IMEFM-06-2017-0153.

Sparreboom P. and Duflos E. (2012). "CGAP-WMFG financial inclusion in the People's Republic of China", CGAP and the Working Group on Inclusive Finance in China, available online at: https://www.cgap.org/sites/default/files/CGAP-WMFG-Financial-Inclusion-in-China-Aug-2012.pdf.

Thomala L. L. (March 14, 2022). "China: Number of mobile internet users 2021", Statista, available online at: https://www.statista.com/statistics/273973/number-of-mobile-internet-users-in-china/#:~:text=By%20the%20end%20of%202021.

Tsai K. S. (November 1, 2017). "FinTech and financial inclusion in China", HKUST IEMS, available online at: https://ideas.repec.org/p/hku/briefs/201720.html.

Turvey C. G. and Xiong X. (2017). "Financial inclusion, financial education, and e-commerce in rural China", *Agribusiness*, Vol. 33, No. 2, pp. 279-285, doi: https://doi.org/10.1002/agr.21503.

Visa. (2019). "Assessing the role of biometrics in advancing financial inclusion", Visa.

World Bank (August 14, 2019). "Inclusive and trusted digital ID can unlock opportunities for the world's most vulnerable", World Bank, available online at: https://www.worldbank.org/en/news/immersive-story/2019/08/14/inclusive-and-trusted-digital-id-can-unlock-opportunities-for-the-worlds-most-vulnerable.

Zhang X., Wan G., Zhang J. and He Z. (2020). "Digital economy, financial inclusion and inclusive growth", doi: https://doi.org/10.19602/j.chinaeconomist.2020.05.07.