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Concealed Risks of FinTech and Goal-Oriented Responsive Regulation: China's Background and Global Perspective•

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Abstract
This article provides critical and analytical views on legal regulation to achieve a balance between FinTech innovation, risk prevention, and financial stability, by focusing on the trend of FinTech firms entering the financial-services industry and the associated regulatory and legal challenges that are already arising in China. It adopts a balanced approach as a theoretical-analysis perspective, weighing various considerations, and proposes the policy option of FinTech regulation under the principle of interest balance. The analysis aims to contribute new insights to an ongoing debate in China on the relationship between legal and regulatory reform, FinTech innovation, and risk prevention. This article argues that legal challenges, rather than technical problems, remain the key obstacles to effective FinTech regulation. Our proposed hypothesis seeks to explain how a legal regulation achieves balancing the competing interests between FinTech innovation, risk prevention, and financial stability in the booming of China's FinTech. Finally, this article proposes the implementation of goal-oriented responsive regulation by improving the legal framework of FinTech regulatory regimes through policy option.

Keywords: China, FinTech, risk prevention, regulation, legal framework

1. INTRODUCTION

Financial technology ("FinTech") firms are entering the financial-services industry and regulatory and legal challenges are already arising in China. FinTech is not just a Silicon Valley phenomenon: China, Singapore, and London all are home to significant FinTech activity.[1] At the

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1. Lee (2016).

broadest level, FinTech refers to the use of technology to deliver financial solutions or refers to the application of technology to finance.[2] FinTech includes any tool or application that relies in any significant part on advanced technology to perform a role significantly related to financial transactions.[3] The term's origin can be traced to the early 1990s[4] and the Financial Services Technology Consortium—a project initiated by Citigroup to facilitate technological co-operation efforts.[5] The continuous evolution and development of FinTech have spawned many new financial forms. The development of mobile Internet in the last decade and the appearance of emerging technologies such as big data, artificial intelligence, and blockchain have brought changes in traditional financial-services industry. As a proportion of the total market size, FinTech firms are also quickly expanding. One study concluded that 10% of the total investable wealth will be in robo-advising funds by 2025.[6] The World Economic Forum has estimated that 10% of the global gross domestic product will be stored on the blockchain by 2027.[7] FinTech has set off on a global scale. Development of FinTech promotes the digitalization and intelligence of the financial-services industry.

China's FinTech has begun to move toward a new stage of development in various vertical segments, and traditional financial institutions have begun to accelerate the pace of transition in the direction of digitalization. At the same time, the cross-border financial products in the financial market have gradually emerged. China's FinTech is developing rapidly. However, while FinTech has brought innovation to the world of finance, it has also had a major impact on the regulatory landscape of China's financial-services industry.

FinTech has emerged as a powerful new market force as a result of coming together with disconnected trends. Significant advances have occurred in the areas of computer and digital technology, the Internet, mobile telecommunications, as well as economics and finance, which have created important potential new business structures and operations, and transformed traditional areas of study.[8] Today, rapid developments in FinTech dominate discussions of financial markets.[9] Although legal scholars have recognized the rise of FinTech, they have yet to pay sustained attention to the concealed risks of FinTech and the interaction between traditional financial industry and the recent wave of digital innovation represented by FinTech. Nor have they analyzed how regulators' institutional design and mission conflict infect financial regulation. Fully understanding the relationship between legal and regulatory reform, FinTech innovation, and risk prevention could help us more clearly analyze the demands and dilemmas of China's FinTech to explore how China's financial-services industry and financial regulatory agencies address new regulatory challenges arising from FinTech and how to optimize

2. Arner, Barberi, & Buckley (2016), pp. 1271, 1274.

3. Bradley (2018), p. 77.

4. It is true that the term "FinTech" originates from the 1990s, but it is also true that applying new technologies to the financial industry is nothing new. The introduction of the telegraph with its first commercial use in 1838 and the laying of the first successful transatlantic cable in 1866 by the Atlantic Telegraph Company provided the fundamental infrastructure for the first major period of financial globalization in the late nineteenth century. See Arner, Barberi, & Buckley, *supra* note 2, p. 1274.

5. Hochstein (2015).

6. MyPrivateBanking (2017).

7. Glob. Agenda Council on the Future of Software & Soc'y (2015).

8. Walker (2017), p. 137.

9. Mooney (2018), p. 1.

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regulatory policy and for implementation of goal-oriented responsive regulation by improving the legal framework of FinTech regulatory regimes.

Immediately following a general introduction in Section 1, Section 2 of this article begins with analyzing the rise of FinTech in China, considering the regulatory implications of its growth, and developing a topology of the FinTech landscape today. Two-dimensional risks are then explored, in the broader evolutionary context, which is necessary for understanding its current status and possible future development. In Section 3, we seek to analyze legal and institutional reforms of FinTech regulation in China and regulatory goals among FinTech innovation, risk prevention, and financial stability. Section 4 seeks how a legal regulation achieves balancing the competing interests between FinTech innovation, risk prevention, and financial stability in the booming of China's FinTech. It proposes the implementation of goal-oriented responsive regulation by improving the legal framework of FinTech regulatory regimes through policy option.

2. RISE OF FINTECH IN CHINA AND TWO-DIMENSIONAL RISKS

2.1 Landscape of China's FinTech

Looking back at the development of China's FinTech over the past decade, we find that FinTech was introduced into China's financial-services industry as early as 2004 but, at that time, FinTech only existed as a traditional financial institution's IT system.[10] With the emergence of payment and peer-to-peer lending, FinTech has penetrated from the back-end stage to the core business of finance. Moreover, with the enrichment of other technical means, the mutual attraction between science and technology will make financial and practical life more closely interacted and eventually integrated into social life. Traditional financial institutions have begun to actively explore the path of FinTech transformation. Mobile banking based on mobile Internet, precision marketing based on big data, and service optimization based on intelligent operation are widely used to promote banking services for reducing cost, improving efficiency, and optimizing customer experience.[11]

The FinTech firms represented by BAT (Baidu, Alibaba, and Tencent) in China have made remarkable achievements. The application of FinTech mainly appears in the fields of online lending, equity crowdfunding, Internet payment, and Internet financing. In many ways, the leadership of China's FinTech is already happening at the industry level, now leading innovation in the financial sector and being replicated globally.[12] For example, AliPay's introduction of facial-recognition payment in March 2015[13] was followed by MasterCard in July 2015.[14] Similarly, small and medium-sized enterprises (SMEs) lending by Alibaba in 2010 using alternative credit-scoring data from its e-commerce platform that was introduced in the US and Japan in 2012 and is now being undertaken by Amazon in Europe.[15]

10. iResearch (2017).
11. PWC (2017).
12. Arner, Barberis, & Buckley, *supra* note 2, p. 1302.
13. Smith, Geoffrey (2015).
14. Pagliery (2015).
15. Smith, Oliver (2015).

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China Merchants Bank—the leader of the 12 largest joint-stock banks in China—proposed to be a "FinTech bank" in 2017. The top five banks in the wealthy class, the top five national banks at the forefront of the World Bank's top 500, have joined forces with FinTech firms. Ping-An Bank has achieved many results in the fields of big data, artificial intelligence, and blockchain.

2.2 Two-Dimensional Risks

The integration of finance and technology has constructed a new and rapid financial ecology outside the traditional financial structure. The openness, interconnectivity, and higher technology content of FinTech, especially in the field of "Internet finance" and peer-to-peer lending, make financial risks more subtle, information technological risks are more prominent, and the potential systemic and periodical risks are more complicated. As the size of the FinTech industry grows, so too will the technological risk and financial risk connected with it. One should not underestimate the risks that would face a broad expansion of FinTech. Internet platforms created novel opportunities and formats for financial services and consumers relationships. Such platforms have simultaneously created new risks for consumers and dislocation for financial-services providers.[16] The events of illegal fundraising in the name of "Internet finance" and peer-to-peer lending are endless, all in the cloak of FinTech, enveloping the core of investment, speculation, and even scams. Such a phenomenon not only expands the local and systemic financial risks, but also suspects fraud, pyramid schemes, and other illegal and criminal acts, which disrupts seriously the financial laws and rules.

FinTech may be obscuring risk. The FinTech model bears many of the features of financial risk and technological risk, and the level of such risks is likely to increase as the industry grows. But recent regulation of the financial-service industry has focused on a different segment of the market and has largely ignored the unique problems associated with FinTech. As a result, regulators have neither the tools nor the expertise necessary to properly guide and constrain the behaviour of FinTech firms.[17] Many aspects of the internal workings of FinTech remain unknown. And it is from this lack of understanding that concerns about risks are born.[18] The financial plug-in of technology wings is stronger, broader, and more rapidly destructive, and the consequences of its impact on the financial market are difficult to predict.[19] Therefore, it is necessary to deconstruct the two-dimensional risks of finance and technology, and analyze them to achieve the regulation and guidance at the institutional level.

With the increasing use of FinTech in the financial-services industry, rules of the financial-services industry have been changed by the technological innovations. At the same time, risks have accompanied this, and the forms of risk and the way customers are perceived have also changed. The financial-services industry is facing the most profound and ambitious technological innovations since the birth of modern financial institutions and financial

16. Svetiev & Tagiuri (2018), p. 619.
17. Magnuson (2018), p. 1204.
18. Odinet (2018), p. 857.
19. Chiu (2016), p. 66.

markets. The technological development of continuous iterations such as big data, artificial intelligence, and blockchain has even begun to fundamentally change the current business model and regulatory framework.[20] Of course, while FinTech promotes China's financial innovation and broadens financial services, it also leads to an increase in potential risks, and FinTech supervision faces challenges.

On a broader perspective, the Chinese regulatory objective of "macro-prudential supervision" focuses on systemic risks, and this objective is one of the greatest values that the global financial crisis has brought. But FinTech firms are also likely to become new systemically important actors, which will undoubtedly lead to an increase in systemic risks. At the same time, the use of innovative means may also enhance the procyclicality of financial markets.[21] Through the powerful information system, the original interconnections in the market will be highly enhanced, and new interconnections will be created, thus increasing the possibility of "cross-infection" in the financial marker. This problem will become more and more serious with the popularity of artificial intelligence. In the process of automation, manual supervision may be reduced, and the experience of financial crisis has already told us that the "standardization" audit is not a guarantee of compliance, and it is impossible to eliminate the hidden systemic risks. Based on this scenario, "macro-prudential supervision" should take into consideration the above risks that FinTech may bring.

The business innovation of some Internet institutions deviates from the track, deviates from the positioning of information intermediary and the nature of services to SMEs and relying on Internet operations, and is alienated into credit intermediaries. There are acts such as illegal lending, establishment of fund pools, and large-scale offline marketing. Risks have occurred from time to time. Some Internet institutions even use self-integration, Ponzi schemes, counterfeit fundraising, and even financial fraud.[22] Effectively understanding the potential risks in the development of FinTech is an inevitable requirement for promoting China's FinTech regulatory reform.

2.2.1 Financial Risk

Information asymmetries in the FinTech industry are high.[23] Most FinTech firms are not subject to the extensive disclosure obligations that large, public financial institutions are, and thus there is significantly less information about them available.[24] When the FinTech firms are unstable and information asymmetry, due to the small scale of FinTech firms, the lack of funding sources, business non-compliance, weak risk control, etc., due to an imperfect industry information-disclosure mechanism, market participants unable to obtain sufficient counterparty's information, which in turn makes credit risk difficult to identify. This lack of information can become an important, and dangerous, channel for propagating financial risk in times of adversity.

In case of peer-to-peer lending, for instance, it can involve default risks to poorly informed investors, agency risks if the peer-to-peer operator ceases operations, and

20. *Ibid.*, p. 81.
21. Financial Stability Board (2017).
22. Chen (2018), p. 60.
23. Langevoort (1997), p. 755.
24. White (2016).

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financial-advice-related risks to the extent that peer-to-peer operators act like credit-rating agencies when they provide risk grades of potential borrowers.

Regulators also identified that online banking and peer-to-peer lending create new credit risks. Through the removal of the physical link between the consumer and the bank, it was anticipated that competition would increase (e.g. borrowers would have access to a greater pool of lenders with the removal of geographical limits).[25] In fact, in many ways, small actors may have greater incentives, and abilities, to engage in excessively risky behaviour than large, more established ones.[26] Consider the Internet-lending industry's practice of off-loading risk; many peer-to-peer lending platforms provide ways for individuals and companies to deal with one another, with the platforms themselves not bearing any of the risks associated with the resulting transactions. This offloading of risk to third parties raises the possibility that crowdfunding firms and peer-to-peer-lending platforms will encourage excessively risky behaviour.

Financial innovation such as peer-to-peer lending often involves more credit creation. Such increases in leverage as a systemic phenomenon often creates greater risk for all participants in the financial and real economies, and could raise systemic fragility in the face of shocks or crises.[27] Further, financial innovation also produces more complexity,[28] which often exacerbates information asymmetry, resulting in mispriced allocations in the market, asset bubbles, and painful corrections and market instability.[29]

Interest rates in peer-to-peer lending also pose obstacles to the growth of the FinTech industry. On the one hand, the income of FinTech products is not stable, and the high-yield model introduced to attract investors cannot be maintained for a long time. On the other hand, the interest-rate marketization reform will enable traditional financial institutions such as banks to increase their competitiveness by lowering deposit interest rates and lowering lending rates, reducing the yield advantage of FinTech institutions.

Taking the Bitcoin as another example of financial risk, most of the holders of Bitcoins do not have the relevant professional knowledge,[30] so it is difficult to determine that the holder invests in the value of Bitcoins, and the behavioural choice is more affected by the "flock." In fact, these financial consumers are often vulnerable to fraud and mislead because of the lack of financial knowledge and blind follow-up.[31] The shock of the "coin circle" from the end of 2017 to the beginning of 2018 is enough to illustrate this point.

2.2.2 Technological Risk

The development of FinTech business depends on advanced technology and an Internet-trading platform. The mistakes in technology and Internet-trading-platform selection will bring greater risks. New FinTech firms use emerging technologies such as big data, artificial intelligence, and blockchain to provide financial services to consumers. In the context of

25. Arner, Barberis, & Buckley, *supra* note 2, p. 1285.
26. Magnuson, *supra* note 17, p. 1207.
27. Adam & Guettler (2015), pp. 204–5.
28. Judge (2012), pp. 660–1 (discussing the consequences of complexity).
29. Chiu, *supra* note 19, p. 62.
30. Sherlock (2017), p. 982.
31. Tu & Meredith (2015), p. 280.

computer-driven transactions, the frequency and volume of transactions are rapidly rising. Technical loopholes or programming errors will have a huge impact on financial markets.[32] When using technologies such as big data, artificial intelligence, and blockchain, data correlation is not used to detect causality, but to predict the future, and it can create miscalculated costs and risks. The participation of technology makes the hidden risks more dispersed, more systemic, and contagious. If the size of the FinTech enterprise is large enough, the bankruptcy risk is quickly transmitted to the enterprises with which it is linked.

Perhaps the most obvious technological risk, and one that has long been a concern in the FinTech world, is shared susceptibility to hacking.[33] While hacking can come in many forms, from merely gathering information to theft to outright system failure, the possibility that the programming that underlies an industry might contain vulnerabilities is a clear pathway for adverse shocks to spread.[34]

2.3 Call for FinTech Regulation

FinTech presents challenges such as cybersecurity-related risks, and also presents opportunities for regulatory compliance and supervision.[35] The rapid development of FinTech calls for urgent effective legal supervision. In China, the term "technology" is more vague than the concept of finance. The form of digital currency is difficult to understand for individual investors. Some firms use this kind of information asymmetry, carry out market-value management with hot spots, deliberately confuse virtual digital-currency issuance and blockchain, and seriously mislead investors. In addition, the growth of virtual digital-currency market value, active currency-exchange transactions, and the prevalence of forks have further exacerbated market turmoil. FinTech in a broad sense can be considered as a FinTech business as long as it is involved in the use of program code. From an academic perspective, this is clearly not a scientific definition, but online users do not usually have professional identification capabilities. The drawback is that, after 2016, some FinTech firms suddenly emerged in the market and, under the pressure of policy tightening on Internet finance, many firms began to advertise their own FinTech concepts for survival and marketing needs. Therefore, there are certain hidden risks in the course of the development of China's FinTech industry.

The rise of FinTech raises concerns about FinTech's effect on the stability of the financial sector. These concerns are closely connected with the structure of the FinTech industry and the ways in which FinTech firms operate, as well as the particular innovation that FinTech is introducing to the market.[36] Based on such circumstances, we should pay attention to and foster the development of FinTech firms with the most open attitude, but we should sort out the development of the industry with the most prudential standards, and provide substantial

32. Yang (2018), p. 72.

33. Hacking, of course, is also a major concern for traditional financial institutions, forcing them to spend significant amounts of money on cybersecurity efforts. But the magnitude of FinTech's exposure to hacking is far greater than that of traditional players, given that many FinTech firms' entire models are based on coding and other forms of automated decision-making.

34. Chiu, *supra* note 19, pp. 106–7.

35. Wiele (2018), p. 16.

36. Magnuson, *supra* note 17, pp. 1199–200.

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support and assistance. Under the market-economy environment, only FinTech firms recognized by the market may play a positive role in the future development of the industry. The mark recognized by the market is the production of technology revenue.

With the cross-border, cross-industry, and cross-market characteristics of blockchain technology, the speed of the financial mixed industry is accelerating and the difficulty of supervision is increasing. The limitations of separate supervision and institutional supervision have gradually emerged, and the shortcomings have been highlighted in the time of the rapid development of FinTech. The participants in the FinTech market are growing rapidly and the types of business are mixed. However, due to various technical reasons, the related business supervision is far behind.

With the mutual penetration and dual integration of technology and finance, the financial market driven by FinTech is advancing rapidly. The traditional regulatory model has been unable to adapt to such a market environment. The path of FinTech supervision has its rationality. In such circumstances, it is time to call for FinTech regulation.

3. LEGAL AND INSTITUTIONAL REFORM OF FINTECH REGULATION IN CHINA

Applying traditional regulatory strategies to new technological ecosystems has proved conceptually difficult.[37] The rise of FinTech brings inevitably the reconstruction of a financial regulatory regime. On the one hand, driven by FinTech, the way financial risk occurs, the breadth of influence, the speed of dissemination, and even the structure, model, and pricing of financial risks are fundamentally different from traditional financial risk, and have not yet been applied to regulatory rules governing the risk of new financial forms. The financial-supervision model under the traditional financial theory is not able to effectively respond to the regulatory needs of new technology-driven financial services. It is necessary to construct a FinTech-supervision model, so as to use real-time, dynamic, and transparent intelligent supervision by means of technology, thereby improving the efficiency of financial supervision and making up for the limitations of the traditional financial-supervision model in dealing with FinTech.[38]

3.1 New Legal Framework of FinTech Regulation

Before 2015, due to the burgeoning period of China's FinTech, the regulatory authorities adopted an inclusive and loose regulatory policy, showing a weak supervision attitude. At this stage, various financial forms are still unclear, and the regulatory authorities only control relatively mature areas such as electronic payment and Internet lending. At this time, the Internet-finance industry developed rapidly but, because of the lack of a strong restraint mechanism and effective supervision, it also showed a situation of brutal growth and extensive development. However, there are legitimate reasons for regulators to adopt a tolerant attitude toward the Internet-finance industry at the initial stage.

37. Brummer & Yadav (2019), p. 235.

38. Yang, *supra* note 32, p. 80.

The law always has a lag. First, there was no proper regulatory framework on FinTech. Although the update of laws and regulations in the financial sector has been considered timely enough, the comprehensive and continuous supervision of the emerging financial innovations still makes the regulatory authorities unable to do so. Second, Internet finance is still in the early stage of exploration. It is difficult for the regulatory authorities to grasp the direction of supervision. It is better to wait and see.[39] Finally, the new financial format is always accompanied by new types of technical means and business models. Even for existing regulations, there was no proper "enforcement" from the regulators. Before 2015, China adopted basically an inclusive and loose regulatory policy for FinTech. Such a scenario indicated both facts: there was a "gap" of legislation and regulation on FinTech, and also the government authorities' attitude towards these new financial innovations by refraining from enforcing the laws.

In 2015, FinTech in China began to emerge. In view of the chaos of Internet finance, the regulatory authorities should shift the tolerant regulatory policies and adopt a strict regulatory attitude. Taking cash loans as an example, after 2015, the online lending industry showed explosive growth in terms of both business scale and number of institutions, but with the emergence of money running, financial fraud, illegal fundraising, violent levy, and so on. The tragedy caused by "campus loan" and "naked loan" is even more common. As a result, the regulatory authorities have issued a series of legal rules and self-regulation rules.

With the increasing risks of Internet finance, frequent violations, and even large-scale bankruptcies, escape, and fraud of the originators, the regulatory authorities have issued rules and regulations specifically for the rectification of Internet finance.

FinTech in this context is regulated by a set of laws, regulations, and rules. In July 2015, the People's Bank of China, the China Banking Regulatory Commission, the China Insurance Regulatory Commission, the China Securities Regulatory Commission, and ten other ministries and Commissions jointly issued the "Guidelines on the Promotion of the Healthy Development of Internet Finance,"[40] and established the basic framework for principled supervision.

However, the overly broad regulations failed to solve the problem in time, and the above-mentioned chaos even appeared to deteriorate. Therefore, the regulatory authorities increased the special regulation of Internet finance. In particular, the General Office of the State Council issued the *Implementation Plan for Special Remediation of Internet Financial Risks* on 13 October 2015.

Subsequently, the People's Bank of China and other regulatory agencies followed up to issue special implementation plans for their respective fields of responsibility. There was a "Regulatory Storm" in the field of Internet finance, and the movement regulation model in the Internet-finance field was begun. At the same time, the "financial-stability" goal of financial regulation is particularly noteworthy. On 28 December 2015, the People's Bank of China promulgated the *Management Measures for Network Payment Services of*

39. For discussing the question of "regulate now or wait and see?", see Didenko (2018), p. 330.

40. For a more analysis of development on Internet finance in China, see Zhou, Arner, & Buckley (2015).

Non-bank Payment Institutions,[41] which clarified the positioning of Internet-payment institutions.

On 13 April 2016, the China Banking Regulatory Commission issued the *P2P Network Lending Risk Special Rehabilitation Work Implementation Plan*.[42]

On 24 August 2016, the China Banking Regulatory Commission and other four ministries and Commissions issued the *Interim Measures for the Management of Business Activities of Internet Lending Information Intermediaries*,[43] which made the P2P network lending a basic law.

On 13 October 2016, the State Council issued the *Implementation Plan for Special Remediation of Internet Financial Risks*.[44] The China Banking Regulatory Commission, the China Securities Regulatory Commission, the China Insurance Regulatory Commission, and the State Administration for Industry and Commerce also issued corresponding specific remediation plans. On that issue, it seems that China's Internet Finance Guidelines and the consultation on third-party payment are pointing towards a two-tiered market. It may introduce a measure of regulatory harmony between traditional financial institutions and new start-up participants.[45]

On 25 April 2017, for the first time, China referred to "maintaining financial security" as part of State Governance. Since then, "preventing and defusing financial risks" has repeatedly appeared in the speeches of senior government officials. The central bank and the regulatory committee have repeatedly released the signal of financial stability.[46] Although China's FinTech market has been booming, supervision is still at the stage of exploration, especially under the goal of "financial stability," and how to promote financial innovation is an important problem to test China's financial regulators. By examining the laws and reforms in Europe and the US, there is a unique opportunity in the technologically driven financial transition currently underway in China.[47] In addition to learning from regulatory mistakes in other countries, China could leapfrog financial regulation models by establishing a regulatory framework that promotes and controls the use of FinTech and Internet-finance companies.[48]

In May 2017, the People's Bank of China Financial Technology Committee ("FinTech Committee") was set up. The FinTech Committee mentioned explicitly strengthening FinTech research with blockchain technology as the core, strengthening the application

41. Fei Yinhang Zhifu Jigou Wangluo Zhifu Yewu Guanli Banfa (非银行支付机构网络支付业务管理办法) [*Management Measures for Network Payment Services of Non-Bank Payment Institutions*].

42. P2P Wangluo Jiedai Fengxian Zhuanxiang Zhengzhi Gongzuo Shishi Fang'an (P2P网络借贷风险专项整治工作实施方案) [*P2P Network Lending Risk Special Rehabilitation Work Implementation Plan*].

43. Wangluo Jiedai Xinxi Zhongjie Jigou Yewu Huodong Guanli Zhanxing Banfa (网络借贷信息中介机构业务活动管理暂行办法) [*Interim Measures for the Management of Business Activities of Internet Lending Information Intermediaries*].

44. Hulianwang Jinrong Fengxian Zhuanxiang Zhengzhi Gongzuo Shishi Fang'an (互联网金融风险专项整治工作实施方案) [*Implementation Plan for Special Remediation of Internet Financial Risks*].

45. Arner, Barberis, & Buckley, *supra* note 2, p. 1305.

46. The report of the 19th National Congress clearly pointed out that the bottom line of non-systemic financial risks was maintained. Since then, major departments including the People's Bank of China and the three regulatory committees have made authoritative interpretations and a series of policies and guidance.

47. Arner, Barberis, & Buckley, *supra* note 2, p. 1302.

48. Arner & Barberis (2015), p. 9 (illustrating how China went from innovation to duplication and the broader (inter)national consequences of this).

of regulatory technology ("RegTech"), and aiming to strengthen the research planning and overall co-ordination of FinTech innovation. The active use of big data, artificial intelligence, cloud computing, and other technologies should be encouraged for enriching financial -supervision methods, improving the ability to identify, prevent, and resolve cross-industry and cross-market financial risks, and effectively strengthen the application of regulatory technology. Relevant regulatory authorities, such as the Bank of China, China Banking and Insurance Supervision Commission, have also continued to conduct research in the field of FinTech and regulation, and explore the use of big data and cloud technology to improve regulatory efficiency.

In May 2017, the People's Bank of China led the joint publication of the *Financial Services Industry Standardization Structure Construction and Development Plan (2016–2020)*,[49] which plans to build financial products and services, financial infrastructure, financial statistics, financial supervision, and risk-prevention and control standards. The People's Bank of China also released the *13th Five-Year Development Plan for China's Financial Services Industry Information Technology* in June 2017,[50] which clarified the development goals of RegTech, required the establishment of a FinTech-innovation-management mechanism, and formulated relevant specific regulations, upgrading regulatory platforms and tools to fully utilize technology to improve regulatory quality and reduce costs.

In addition, the Shanghai Banking Regulatory Bureau has created a regulatory innovation interactive platform in the free-trade zone. In principle, it is similar to the regulatory sandbox adopted by the UK[51] and it is a pioneering pilot exploration in the free-trade zone. However, there is still a problem: the platform cannot put all FinTech firms in, because many FinTech firms are not under the control of the banking regulatory bureau, and the banking regulatory bureau does not have the power for administration of market access and licences in this regard.

3.2 Institutional Reform of Regulators

In recent years, in the field of financial regulation, the arrangement of the regulator system has undergone tremendous changes. The Chinese Fifth National Financial Work Conference, held in July 2017,[52] set the policy for future financial institutional reforms and direction. Three tasks were highlighted in the meeting, including making the financial sector better serve the real economy, containing financial risks, and deepening financial reforms.[53] At the same time, the report of the conference clearly stated that the supervision

49. Jinrong Ye Biaozhunhua Tixi Jianshe Fazhan Guihua (2016~2020) (金融业标准化体系建设发展规划（2016–2020年）) [*Financial Services Industry Standardization Structure Construction and Development Plan (2016–2020)*].

50. Zhongguo Jinrong Ye Xinxi Jishu "Shisanwu" Fazhan Guihua (中国金融业信息技术"十三五"发展规划) [*13th Five-Year Development Plan for China's Financial Services Industry Information Technology*].

51. The UK's Financial Conduct Authority (FCA) has created a regulatory project that allows FinTech firms and start-ups to launch new financial products on an accelerated basis and with minimal regulatory barrier. See Colchester & Witkowski (2016).

52. The National Financial Work Conference has been held every five years since it was first held in 1997.

53. National Financial Work Conference has been held in Beijing; see –http://www.gov.cn/xinwen/2017–07/15/content_5210774.htm (accessed 10 November 2019).

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mode was shifted to "functional supervision and behavior supervision," which means that the previous mode of "separate operation and separate supervision" will be replaced.[54]

This conference set up the Financial Stability and Development Committee ("FSDC") of the State Council, charged mainly with strengthening the macro-prudential management and systemic risk prevention of the People's Bank of China, and strengthening the supervision function of financial regulatory authorities, and ensuring financial stability. The office of the FSDC is located within the People's Bank of China, but it is directly under the leadership of the State Council.

China's FinTech supervision was upgraded to a new regulatory model consisting of one committee, one bank, and two Commissions.[55] The status of the FSDC is expressed as the deliberation and co-ordination institution of the State Council. The establishment of the FSDC was charged with co-ordinating macro-prudential supervision and promoting the deepening reform of the financial industry. The FSDC is responsible for co-ordinating the People's Bank of China, the China Banking Regulatory Commission, the China Insurance Regulatory Commission, the China Securities Regulatory Commission, the Foreign Exchange Bureau, the Development and Reform Commission, and the Ministry of Finance.

The People's Bank of China has been assigned with two roles in future financial supervision. One is to make up for the regulatory gaps that have occurred in the past and the other is to strengthen the formulation of financial rules.[56] The People's Bank of China will play a more important role in the new financial regulatory framework.

By March 2018, the *Plan for Organizational Reform of the State Council* was approved, and the China Banking Regulatory Commission and the China Insurance Regulatory Commission were integrated into the China Banking and Insurance Regulatory Commission, charged for drafting important laws and regulations for banking and insurance industries, as well as for drafting regimes of prudential supervision.[57] On 8 April 2018, the China Banking and Insurance Regulatory Commission was officially set up. The merger of the China Banking Regulatory Commission and the China Insurance Regulatory Commission will also help the reform direction of target supervision.

Through the above steps, China's institutional supervision mode has gradually been replaced by the functional supervision mode. Overall, the establishment of the Financial Stability Development Committee is of positive significance under the current financial regulatory framework. In the future, it should be able to guide the FinTech company's mixed business model involving multiple regulatory authorities or regulatory authorities. From the perspective of positioning, the current responsibility of the Financial Science and Technology Committee focuses on the study of FinTech and focuses on the regulatory function, while the Financial Stability Development Committee is based on the structure of "one bank and two Commissions" for purpose of carrying out co-ordinated supervision of the FinTech. The next step of reform is to introduce the regulatory

54. *Ibid*.

55. These regulatory agencies are the Financial Stability and Development Committee of the State Council, the People's Bank of China, the China Securities Regulatory Commission, and the China Banking and Insurance Regulatory Commission.

56. Hui Bao Tian Xia (2018).

57. Xinhua (2018).

sandbox mentioned in the previous sections. The principles of the guidelines announced by European Supervisory Authorities could be used to help China to launch the regime of a regulatory sandbox, based on the experiences introduced by the UK's Financial Conduct Authority (FCA)'s Global Financial Innovation Network.[58]

3.3 Risks for the Policy-Makers to Manage

Financial regulatory policies have a lag, and their emergence often occurs after innovative services. With the innovation of the financial-service model, financial supervision should also be constantly adjusted. China's Internet finance has the characteristics of a "cross-border mixed industry" and is "technically intensive." It is based on the above characteristics that financial services have been innovated in different forms, and the resulting risk spillover has brought many difficulties to financial supervision. Risks for the policy-makers to manage or eliminate are embodied among the following dilemmas.

3.3.1 Non-Adaptability of a Separate Regulatory Regime to Face the Variability of FinTech

FinTech in China has been developed from Internet finance. Therefore, it has obvious non-traditional characteristics and can break the fixed financial-service boundary. It also has variability, which is mainly reflected in the innovation of financial-service channels, and also in financial products and service innovation.

The cross-regional nature of financial services has created difficulties for financial regulation. China's regulatory bodies, which consist of one central bank and two regulatory Commissions, focus mainly on the regulatory areas according to the administrative districts, and carry out targeted supervision. This kind of supervision is not enough to deal with the rapid changes of FinTech in the financial market, and bring certain monitoring to financial statistics difficulties.

3.3.2 Embarrassment for Real-Time Financial Supervision

In addition, the real-time nature of FinTech will also bring embarrassment to the real time of financial supervision. Regulators need time for research on the problems caused by the activities of FinTech and for making regulatory plans. During this period, FinTech may exist in an unregulated state. How to create financial supervision that meets the characteristics of a variety of financial formats has become a dilemma for financial regulators.

3.3.3 Difficulty of Supervision Caused by the Integration of Activities between Finance and Technology

With the development of the network platform, the non-financial fields such as finance, e-commerce, and mobile Internet have also begun to be closely integrated, and different business boundaries have been broken. This is also a major feature of Internet finance.

58. The Global Financial Innovation Network (GFIN) is a co-operation mechanism initiated by the British FCA to call for the participation of financial supervisors from different countries. The official website is https://www.fca.org.uk/firms/global-financial-innovation-network (accessed 10 November 2019); for the specific content, see Terms of Reference for Membership and Governance of the Global Financial Innovation Network (GFIN), Section 6.1.

While FinTech firms continue to deliver technology to the financial industry, they also deal with financial services. This has also created difficulties for current financial-policy research.

3.4 Inadequacy of the Existing Legal Framework to Respond to Two-Dimensional Risks

Regulation in China has failed to adequately take into account the rise of FinTech firms and the fundamental changes they have ushered in on a variety of fronts, from the way that banking works, to the way that capital is raised, even to the very form of the peer-to-peer-lending area.

The above explanation and analysis show that the existing legal framework in China does not obviously respond to two-dimensional risks adequately. Such risks call for a reconsideration of financial regulation by a policy option for improving the legal framework of FinTech regulatory regimes in China.

3.5 Regulatory Objective: FinTech Innovation, Risk Prevention, and Financial Stability

The function of the FinTech regulatory regime is facilitating mechanisms that help societies to cope with drivers of socioeconomic transformation, such as FinTech. Such mechanisms emerge from the operation of a FinTech regulatory regime and particularly from its interaction with financial rules and business practices. They provide scope for alleviating the dislocating effects of FinTech and mediating the opportunity-creating and protective functions of regulation.[59] Such mediation can result from the opportunities for financial regulators to take consideration of regulatory objectives in developing regulatory or business solutions that respond to different public-interest concerns.

A FinTech regulatory regime can be structured in many ways, depending on the regulatory objectives of the regulators. Policy considerations for FinTech require a balance in regulatory objectives between FinTech innovation, risk prevention, and financial stability.[60]

The FinTech regulation could perform an objective of prudential regulation, focusing on risks prevention and financial stability. Regulatory authorities are charged with monitoring the underlying risks of fraud and actor's abuse. FinTech firms and start-ups will try to comply with reasonable guidelines particularly if the goal of risk prevention is readily apparent or clearly articulated.[61] For enforcement of the regulatory laws and rules, the State Council in China has set up an FSDC committee to implement the market regulation and the policy objectives of risk prevention and financial stability. Along with the reform based on functional supervision, the People's Bank of China and financial regulatory authorities participate in the regulatory investigation of the financial industry.

The FinTech regulation could also perform an objective of promoting FinTech by supporting technological innovation. Regulatory authorities could foster the development of the FinTech sector by implementing regulatory sandboxes or similar practice.[62] FinTech

59. Svetiev & Tagiuri, *supra* note 16, p. 620.
60. See Xu (2019), p. 106.
61. Bradley, *supra* note 3, p. 84.
62. For a more detailed discussion of various FinTech-promoting regulatory techniques, see Zetzsche et al. (2017).

promotion can be driven by increasing market competition, or achieving greater levels of financial inclusion.[63] Whenever FinTech promotion is considered as the underlying regulatory objective, regulators need to carefully consider whether FinTech businesses might require some form of preferential treatment to make new products and solutions more attractive, at least to a certain extent.[64]

4. POLICY OPTION AND GOAL-ORIENTED RESPONSIVE REGULATION

The concealed risks of FinTech present immediately a keen legal problem—a problem of the regulatory path and responsiveness.

4.1 Implementing Effective Regulatory Policy

An effective regulatory policy could reduce systemic risk. Future crises are unpredictable. The main point is that regulatory policy can become a valuable ally for financial stability in the FinTech era. Neglecting regulatory policy can lead to missed opportunities to reduce familiar risks in the short term and may create new threats in the long run. It is important to understand the stakes, focusing on the opportunities and challenges presented by FinTech and helping to develop the stakes of effective regulatory policies, because policy-makers and regulators can contribute to regulatory shortcomings in a variety of ways.

The policy-makers must decide how to allocate limited resources among different regulatory goals, and must consider the possibility that pursuing one mission will undermine others. The point here is not that regulation should win out over other major financial regulatory goals that currently receive greater attention, such as FinTech innovation and risk prevention. Regulatory policy is important not only in its own right for the laws and rules, but also for how it can advance FinTech innovation and risk prevention.

Independent FinTech has created its own threat to financial stability. Over time, an independent FinTech could become so giant and interconnected that its failure could undermine the effectiveness of the legal and regulatory regime. A concentrated FinTech market could create additional risks from co-ordinated large-scale financial movements or systemically important FinTech institutions.[65]

4.2 Integrating Technology into Financial Regulation

The implementation of intelligent dynamic supervision relies on the coding of financial regulatory rules or the identification of machines—that is, automated supervision through code. Blockchain technology enables the rapid expansion of the "structural" role of code, hardware, and other constrained behaviours, at least redefining the design, implementation, and enforcement of legal and regulatory rules. Decentralized technologies (such as

63. When announcing the plans to introduce special-purpose national charters to FinTech companies in the US in late 2016, the Comptroller of the Currency Thomas Curry noted that "[f]intech companies hold great potential to expand financial inclusion, empower consumers, and help families and businesses take more control of their financial matters." See Curry (2016).

64. Didenko, *supra* note 39, p. 328.

65. Loo (2018), p. 251.

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blockchain technology) can be used for technology-driven financial regulation, while technology-driven rules can be viewed as technological law for FinTech participants and legislative authorities.[66] In this model, regulators play a dual role: formulating laws and regulations; and working with technical experts to embed laws and regulations in decentralized technology and gain full network recognition, so that the implementation of laws and regulations can be achieved through code.[67]

Automated supervision through code creates data and protocol-based solutions that include risk data, transaction data, and process data. The agreement is simply a digitalization of regulatory requirements, regulatory policies, and compliance requirements. The main advantage brought by digitalization, which is a type of innovation,[68] is that it does not require offline manual intervention, reduces the problems caused by discretion, and can establish a unified implementation standard. Both financial institutions and regulatory agencies adopt automated procedures to deal with them, greatly reducing costs and improving efficiency and reducing moral hazard. Regulators can provide regulatory documents and other documents in machine-readable form, which obviously makes it easier to synchronize regulatory dynamics. The legislator's modification of the current rules is recorded and stored in the form of data. This form of data can be directly processed by the financial enterprise, which in turn can automatically modify its internal settings, automatically update the rules and regulations, and report mechanisms.

It is important to note that, because writing code requires specific expertise, without the co-operation of experts in the decentralized technology ecosystem, regulators will not be able to draft rules that allow the machine to be identified. Only high-frequency co-operation and mutual response between the drafters of the law and the writers of the code can ultimately lead to strict and valuable regulatory rules. In addition, in the process of co-operation between regulators and the FinTech industry, it is inevitable to discuss the functional objectives of the current regulation. How to embed these goals in a code-supported system and make them function equally is very important.

For the automation system, trusted algorithm constraints and execution are more conducive to enhancing people's trust in the system than the design code of the mandatory disclosure system. In the past 20 years, many scholars have called for greater transparency in automated procedures, but this approach is not a panacea. The most representative method is to disclose the source code of the system, but this is only a small step in ensuring the reliability of the automation program because non-experts cannot understand the source code of a computer system. Even an expert can hardly figure out what the software code execution will produce: checking the source code has a limited effect on predicting how the computer program will run.

The typical representative of emerging automation decisions is machine learning, especially for source-code analysis. Because it automates the decision-making rules based on the specific data being analyzed, no one can predict a specific process. In this case, the source code has little effect on the reviewer because the code only indicates the machine learning method used and not the data-driven decision rule. To take a step back, even if the open

66. See Gudkov (2018), p. 354.

67. Zhu, Taihui, & Chen (2016).

68. See Jatic et al. (2017), p. 63.

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source code is feasible, it is not possible to open it in many cases, especially when it comes to consumer data protection, commercial proprietary information, and trading secrets. However, the development of technology has provided a new opportunity to improve governance and enhance reliability through the set-up of computer programs, which can make automation decisions more in line with legal and policy objectives.[69]

4.3 Moving toward Goals-Oriented Regulation

While the considerations underlying the conventional wisdom remain important, clear and specific laws may not be possible when technology is changing rapidly and when its application provides full flexibility to evade narrowly drawn, bright-line rules. Faced with a concern over legal obsolescence given the speed of change and technologically enabled evasion of legal standards, a turn to more purposive, goals-oriented legislation may be effective. It is necessary to appraise legal, governance, and scalability issues, and support effective efforts of FinTech.[70]

A potential approach would be to orient regulations explicitly toward goals or purposes in regulations,[71] so the rules can remain applicable. Along these same lines, goal-oriented laws and rules could expressly require that FinTech firms and start-ups put into place internal procedures to address major policy concerns that their business models raise—in other words, could require companies to invest in compliance. Required compliance policies might include mandatory consideration of the discriminatory impact of technologies or of security risks with respect to personally identifiable information.[72]

5. CONCLUSION

The purpose of this article is to provoke a conversation about the ongoing debate in China on the relationship between legal and regulatory reform, FinTech innovation, and risk prevention, by focusing on the trend of FinTech firms entering the financial-services industry and the associated regulatory and legal challenges. FinTech is transforming the financial-services industry and challenging financial regulation at an unprecedented rate.[73] FinTech is already pervasive in virtually every aspect of the financial market, both for the financial services industry and for financial consumers. Application of FinTech tools has unquestionably reduced transaction costs to the benefit of all, and has all sorts of other unpredictable effects.

As the previous sections have demonstrated, FinTech raises red flags related to technological and financial risks. FinTech firms are particularly vulnerable to adverse shocks, they have multiple pathways for those shocks to spread to other actors, and they present significant informational asymmetries. All of these elements indicate that FinTech could potentially serve as a catalyst for wider losses in cases of extreme events, some of which may

69. Ying, Xichen, & Wang Yiwei (2018), p. 5.
70. Wiele, *supra* note 35, p. 18.
71. Brummer (2015), pp. 1039–42 (discussing the attractiveness and limitations of goal-oriented regulation).
72. Bradley, *supra* note 3, p. 84.
73. Zetzsche et al. (2018), p. 393.

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be predictable and others of which may not.[74] A financial ecosystem with a well-regulated environment and a clear regulatory framework will rapidly promote the development of FinTech and provide an effective ecological environment for FinTech by assessing whether there are unjustified regulatory obstacles to financial innovation in the financial-services regulatory framework. FinTech creates opportunities and uncertainties not just for transacting parties, but also for policy-makers and regulators. Abuse may be overlooked if blind optimism concerning a technological tool holds sway or innovations may be stifled if distrust dominates instead.[75] The task of policy-makers is to permit technological development to be as free as possible while controlling risks. To innovate policy-making in the face of transformative social change does not mean simply protecting pre-existing business or national practices and holders of privilege. Instead, it means re-examining the values and policy objectives underlying such practices. It also means finding novel ways to pursue those values and policy objectives, if it is still worth doing so.

As discussed above, legal challenges, rather than technical problems, remain the key obstacles to effective FinTech regulation. The ideal prospect is to implement a goal-oriented responsive regulation through an effective regulatory approach, with a view to balancing the competing interests of FinTech innovation, risk prevention, and financial stability in the booming of China's FinTech.

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74. Magnuson, *supra* note 17, p. 1204.

75. Bradley, *supra* note 3, p. 95.

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