Master Thesis

FinTech disruption and RegTech solutions

A case study on China

'We need banking but we don't need banks anymore' – Bill Gates, 1997

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12 June 2017
LLM International Business Law
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List of Abbreviations

AMLD	Anti-Money Laundering Directive
API	Application Programming Interface
CAC	Cyberspace Administration of China
CBRC	China Banking Regulatory Commission
CFPB	Consumer Financial Protection Bureau
CIC	China Investment Corporation
CLS	Continuous Linked Settlement
DAO	Decentralized Autonomous Organization
EBF	European Banking Federation
eIDAS	EU Regulation on Electronic Identification and trust services
EMD	EU e-Money Directive
FCA	Financial Conduct Authority
FinCEN	Financial Crimes Enforcement Network
FinTech	Financial Technology
GDP	Gross Domestic Product
ICP	Internet Content Provider
KIIO	Key Information Infrastructure Operators
KYC	Know-Your-Customer
MIIT	Ministry of Industry and Information Technology
NFC	Near Field Communication
NSSF	China's National Social Security Fund
OCC	Office of Comptroller of the Currency
P2P	Peer-to-Peer
PBoC	People's Bank of China
PRC	People's Republic of China
PSD	EU Payment Services Directive
PSD2	EU Payment Services Directive 2
QR	Quick Response Code
RegTech	Regulatory Technology
RMB	Chinese renminbi
RRR	Reserve Requirement Ration
SME	Small and Medium-sized Enterprises
SOE	State Owned Enterprise
TPP	third party payment
VC	Venture Capital
WMP	Wealth Management Products
WTO	World Trade Organisation

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Abstract

This thesis addresses the following question: Is the Chinese FinTech Industry – currently and in the future – adequately regulated to bring consumer benefit in the financial services industry? FinTech is a fast-growing industry that has the potential of disrupting the entire traditional banking system, especially in China where a large customer base remains underserved by the current financial industry. Even though FinTechs could benefit from regulatory lacunas, legislation recently put in place is restricting FinTechs. It has the aim to both protect the consumer (sometimes rightly so) but also gives incumbent companies the privilege of high barriers to enter their market. This is not beneficial for the Chinese consumer and will in the long-term harm the opportunities for Chinese citizens to satisfy their financing needs. The problems are not isolated to China, as both in the US and EU regulators are struggling in working with FinTech, leading mostly to a reactive and fragmented approach. Future regulation should be guided by RegTech in order to be pro-active to ensure consumer benefit from FinTech developments. Important aspects for the regulator to pay attention to are to be found on the short and long term. To improve current regulation big data coming from regulatory sandboxes can be effective, as well as from consumer feedback, incubatees and citizen information. Long term solutions are much more drastic, blockchain (either public or consorted) and smart contracts can disrupt the regulatory system. These options are however inevitable as they lead to the most positive effect for Chinese citizens.

Table of Contents

INTRODUCTION

It is clear that the financial system is going through a transitionary phase that offers 'an opportunity to transform the entire banking system'[1] where technologically advanced companies are influencing the financial system. Start-ups find opportunities where traditional banks left them unused or have not even looked before. Consumers can more and more make use of technology in order to manage their financial affairs. This specific change is called FinTech: a contraction of finance and technology. Through these changes, the role of banks has been up for discussion for quite some time, especially the structure of a rigid financial system with a central bank at the top[2] and a traditional value chain.[3] Banks were until recently in a privileged position, partly created by the regulator. Regulations saw an increase post-crisis and are focussed on incumbent companies that use a top-down approach of doing business.[4] A high burden of regulation does put constraints on banks, but also leads to high barriers to entry in the industry.[5] The fact that in the last years (or last months[6]) some licenses are given

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[1] Annette Mackenzie, 'The Fintech Revolution' (2015) 26 London Business School Review 50 p. 50
[2] Thomas F. DappDeutsche Bank, *Fintech reloaded - Traditional banks as digital ecosystems* (Deutsche Bank Research: Current Issues Digital economy and structural change, 2015) p. 17
[3] Marcin Kotarba, 'New Factors Inducing Changes in the Retail Banking Customer Relationship Management (CRM) and Their Exploration by the Fintech Industry' (2017) 8 Foundations of Management 69 p. 74
[4] Thomas Philippon, 'The Fintech Opportunity' (2016) 22476 NBER Working papers p. 2
[5] Imran Gulamhuseinwala, Thomas Bull and Steven Lewis, 'FinTech is gaining traction and young, high-income users are the early adopters' (2015) 3 The Journal of Financial Perspectives 17 p. 23
[6] Rachel Witkowski, Telis Demos and Peter Rudegeair, 'Regulator Will Start Issuing Bank Charters for Fintech Firms' *The Wall Street Journal* (<https://www.wsj.com/articles/regulator-will-start-issuing-bank-charters-for-fintech-firms-1480691712> accessed 14 April 2017

out that finally allow FinTech Companies ('FinTechs') to legally expand into banking activities shows that the regulatory perspective until recently solely was focussed on traditional banks.

The idea of FinTech is not new by any measure. John Reed, at the time chairman of Citicorp, already defined it in 1993.[7] He mentioned the term regarding the establishment of the Smart Card Forum, a Citicorp initiative to have minds of the public and private sector meet to accelerate the implementation of the Smart Card for payment.[8] He already welcomed the combination of technological companies and the financial sector, further proven by Citicorp's early engagement in ATM technology.

Experts have diverging opinions concerning the plan of actions that banks and regulators need to take regarding FinTech. Some argue that even though banks need to partake in digitization, they 'have a realistic chance of remaining the contact partner for all money related matters'[9] and their comparative advantage should not be underestimated. This advantage would be based on the access to capital for a much lower price than FinTechs can offer and the expertise that human capital brings with it. Further, the current market of FinTech is small compared to the traditional banking industry in many countries. They therefore would struggle to gain a lot of traction. Next to that, scandals have plagued the FinTech world, leading to consumer distrust and weariness in investing or using alternative payment and funding means. Partly because of this, the financial sector is in many countries heavily regulated and therefore unattractive to new players who need to adhere to strict rules.[10] FinTechs would become, in the process of compliance, more like a bank than a software start-up. Many FinTechs are built upon the traditional infrastructure of payment and deposits. Without this infrastructure in place, they would never be able to flourish, therefore FinTechs are dependent on banks[11]: 'Banks (…) are required at some level to settle all (…) transactions so there is no scenario where banks aren't part of the picture'.[12] Experts also argue that while the FinTechs might want to disrupt the market, they will all disappear through bank acquisitions in order to stifle their innovation.[13]

I whole heartedly disagree with the above line of argumentation, and would argue that FinTechs will deeply disrupt the financial system in all of its activities. Even though some FinTech initiatives are now still dependent on banks, this will soon change as technology will advance and its adoption will increase further. Fortunately, the above seems not to be the majority view. The idea that FinTech will be able to disrupt the current financial system is very prevalent. Experts are seeing enormous opportunities for FinTechs, where especially the close relationship with the consumer, the reducing of costs and the regulatory environment have been named as factors enhancing this 'breath-taking pace'[14] of growth.[15] Further, FinTechs have been taking advantage of technological advancements in order to fuel their growth and optimization of digital distribution networks

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[7] Thomas Puschmann, 'Fintech – (R)evolution of the Swiss Financial Services Industry' *Finanz und Wirtschaft* (24 November 2016) <http://www.fuw.ch/article/fintech-revolution-of-the-swiss-financial-services-industry/> accessed 20 February 2017

[8] B.A. Good, *Changing Face of Money: Will Electric Money Be Adopted in the United States?* (Taylor & Francis 2014) p. 34

[9] Thomas F. DappDeutsche Bank, *Fintech – The digital (r)evolution in the financial sector* (Deutsche Bank Research: Current Issues Digital economy and structural change, 2014) p. 28

[10] Bryan Yurcan, 'What Banks and Fintech Need to Ponder Before They Partner' *American Banker* (23 May 2016) <https://www.americanbanker.com/news/what-banks-and-fintech-need-to-ponder-before-they-partner> accessed 14 April 2017

[11] S.P., 'Why fintech won't kill banks | The Economist' *The Economist*, (2015) <http://www.economist.com/blogs/economist-explains/2015/06/economist-explains-12> accessed 22 February 2017

[12] Simon Clark, ''Fintech' Will Mostly End in Tears, Christopher Flowers Says' *The Wall Street Journal* (25 February 2016) <https://www.wsj.com/articles/fintech-will-mostly-end-in-tears-christopher-flowers-says-1456411711> accessed 14 April 2017

[13] Andrew Ross Sorkin, 'Fintech Firms Are Taking On the Big Banks, but Can They Win?' *The New York Times* (6 April 2016) <https://www.nytimes.com/2016/04/07/business/dealbook/fintech-firms-are-taking-on-the-big-banks-but-can-they-win.html?_r=0> accessed 14 April 2017

[14] Deloitte, *Connecting Global FinTech: Hub Review 2016* (Deloitte in collaboration with All Street Research, 2016) p. 1

[15] Charles Teschner and others, *Fintech in Capital Markets: A Land of Opportunity* (The Boston Consulting Group: Expand Research, 2016) p. 6

independent of existing infrastructure and financial entities.[16] The financial data also backs up these claims, as global FinTech financing activity grew with an average of 65% every year for the last 7 years.[17]

This thesis will focus on the Chinese market because this market has shown extensive progress when it comes to FinTech development and bears some unique characteristics that provide fertile ground for FinTech innovation. The development of the FinTech industry has nowhere been as high paced and invasive as it has been in China in the last years. Here, FinTech industry has reached a 'tipping point of inflection' whereby FinTech is 'broadly accepted by the mass market'[18] and more than 54% of non-cash payments in the Chinese market are done through non-bank institutions. The development is not surprising: the Chinese government has put large emphasis on the regulation and promotion of innovation in the financial industry in their Five Year Plan starting in 2016.[19] This makes the Chinese market a forecasts of what might be in the future of markets in other countries, and therefore an interesting case to investigate thoroughly. Even though in all countries the financial markets and by extension FinTech markets have developed in their unique manner, it might be wise for others to look at the different steps the Chinese regulator has taken in their ever changing relationship with FinTechs. Other regulators might learn lessons for future; what to do and avoid to ensure consumers and Small and Medium Enterprises ('SMEs') will reap benefits from FinTech developments while still remaining within the limits of consumer protection.

The traditional structure of banking in China came under attack with the progression of, and broader access to, technology. This made many of the characteristics that helped physical money to its success diminish in value to consumers. This progress and the technological innovation it brings with it, is currently seen as the 'post-cash era', whereby cash and credit cards are disappearing while other sorts of payment methods take the upper hand.[20] The current bank skillset of performing investment for customers is rendered less relevant, and banks who resist change could be left stranded. In the financial industry, the payment sector is the most imminent under threat, but by no means the sole one in transition. Other activities such as lending, insurance and asset management are also dealing with drastic changes. Overall, one can distinguish a move away from banks and towards other forms of financing, often in the private sphere. More specifically, many consumers are moving towards companies that have more of a technological and ICT background than a financial background. Regulators are strained by current regulation, and are sometimes unwilling to undertake appropriate action to enhance consumer benefits. Technology companies are setting up business models with varying rates of success, thereby not always falling under current regulatory categories.

The change in the market necessitates an exploration of how all players in this field (banks, technology companies, regulators, etc.) are affecting each other and the consumers. Analysis of FinTech focussed on the Chinese market already exists in current literature.[21] However, the Chinese regulatory approach towards

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[16] Mariano Belinky, Emmet Rennick and Andrew Veitch, *Rebooting Financial Services* (The Fintech 20 Paper, 2015) p. 19

[17] Dennis Fortnum and others, *KPMG The Pulse of Fintech Q4 2016* (Global analysis of investment in fintech, 2017) p. 10; CB Insights, *The Global Fintech report Q1 '17* (CB Insights, 2017) p. 10; Warren Mead, Joe Cassidy and Matthew Wong, *Pulse of Fintech: 2015 in review* (CB Insights Pulse of Fintech Webinar, 2016) p. 12

[18] Sachin Mittal and James Lloyd, *The Rise of FinTech in China - Redefining Financial Service* (A collaborative report by DBS and EY, 2016) p. 10

[19] Moreno Bertoldi, Annika Eriksgård Melander and Peter WeissEuropean Commission, *Can Economic Transitions Be Planned? China and the 13th Five-Year Plan* (European Economy Economic Briefs, 2016) p. 4

[20] Somini Sengupta, 'The Post-Cash, Post-Credit-Card Economy' *The New York Times* (28 April 2012) <https://www.nytimes.com/2012/04/29/sunday-review/the-post-cash-post-credit-card-economy.html> accessed 20 February 2017

[21] Douglas W. Arner, Janos Nathan Barberis and Ross P. Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?' (2015) University of Hong Kong Faculty of Law Research Paper No 2015/047 p. 23; A history in Yongwoon Shim and Dong-Hee Shin, 'Analyzing China's Fintech Industry from the Perspective of Actor–Network Theory' (2016) 40 Telecommunications Policy 168 p. 171-177 A case-study of a FinTech company in China: Carmen Leong and others, 'Nurturing a FinTech ecosystem: The case of a

FinTech and its influence on consumer benefit that includes the last few years and presents initiatives towards successful applications in the future, is still lacking. This thesis fills this gap by analysing not only the current trends in the financial industry regarding the move towards private companies that use a technical approach to reach their customers, but also assess the challenges that all parties face from this trend. It will give some approaches the regulator can use in order to ensure that effective regulation is implemented. Through effective implementation the chance of obtaining the goal that the regulator intended while minimizing the unintended consequences will be more easily obtainable.

The best plan of action for both banks and regulators is, in my opinion, to drastically change their current working methods in order to stay relevant on the global playing field. Adequate regulation would ensure that FinTechs will 'enter the [banking] system through a clearly marked front gate, rather than in some back door, where risks may not be as thoughtfully assessed and managed'.[22] This would ensure that consumers can benefit optimally in terms of larger access to funds and protection against fraud. This thesis seeks to find solutions that achieve this goal.

It provides a case study concerning the regulatory approach the Chinese government has taken concerning the effect that FinTechs have on the banking system, and whether this approach is helpful or harmful to the end consumer. A case study type analysis is performed in order to allow for a detailed and in-depth investigation in the market and its imminent change. It allows for giving solutions that apply to the particular case of the Chinese regulator and the challenges they are facing. To my opinion, this is the most appropriate method because advantages and disadvantages of certain solutions are difficult to be generalised over various nations and regulatory systems.

The study aims to determine whether the Chinese government's current approach is the optimal solution in regulating the FinTech industry in order to ensure consumer benefits. This approach can either be executed with the aim of protecting the consumer against behaviour of these FinTechs, or making sure consumers can benefit as much as possible from the activities of these companies; unconstrained of any traditional banking regulation or an option in-between these two extremes.

In the first chapter this thesis elaborates on FinTech and its history, particularly in China. Chapter II identifies the current banking industry and the effect of FinTech, thereby researching on potential vulnerabilities for traditional banks. Chapter III discusses the regime of regulation that influences FinTech firms, after which it proceeds in identifying which current regulations benefit or hinder both traditional banks and FinTech firms, and in the end consumers. Further, a comparison is made between regulators around the world that need to deal with FinTech developments (Chapter IV). Markets show vastly different degrees of growth, how can this be explained? This thesis finds explanations for these discrepancies mostly related to the reactive or proactive stance of the regulator[23]. Chapter V, which takes a more predictive approach, proposes additions and changes not only in law but especially in law-making, while taking into account the characteristics of regulatory regimes. Consideration is given to the balancing act that governments need to make between encouraging innovations in the financial markets and to protect both consumers and incumbents in the market. Chapter VI concludes.

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youth microloan startup in China' (2017) 37 International Journal of Information Management 92 p. 93-97; focussed on the P2P lending: Qizhi Tao, Yizhe Dong and Ziming Lin, 'Who Can Get Money? Evidence from the Chinese Peer-to-Peer Lending Platform ' (Forthcoming) Information Systems Frontiers p. 10-12

[22] Rachel Witkowski, 'Regulator will start issuing bank charters for fintech firms' *Financial News London* (London 2 December 2016) <https://www.fnlondon.com/articles/regulator-will-start-issuing-bank-charters-for-fintech-firms-20161202> accessed 14 April 2017

[23] Erik P.M. Vermeulen, *What is the Best Regulatory Response to Fintech?* mediumcom/@erikpmvermeulen (1 March 2017) <https://medium.com/@erikpmvermeulen/what-is-the-best-regulatory-response-to-fintech-e3caa0ca003c> accessed

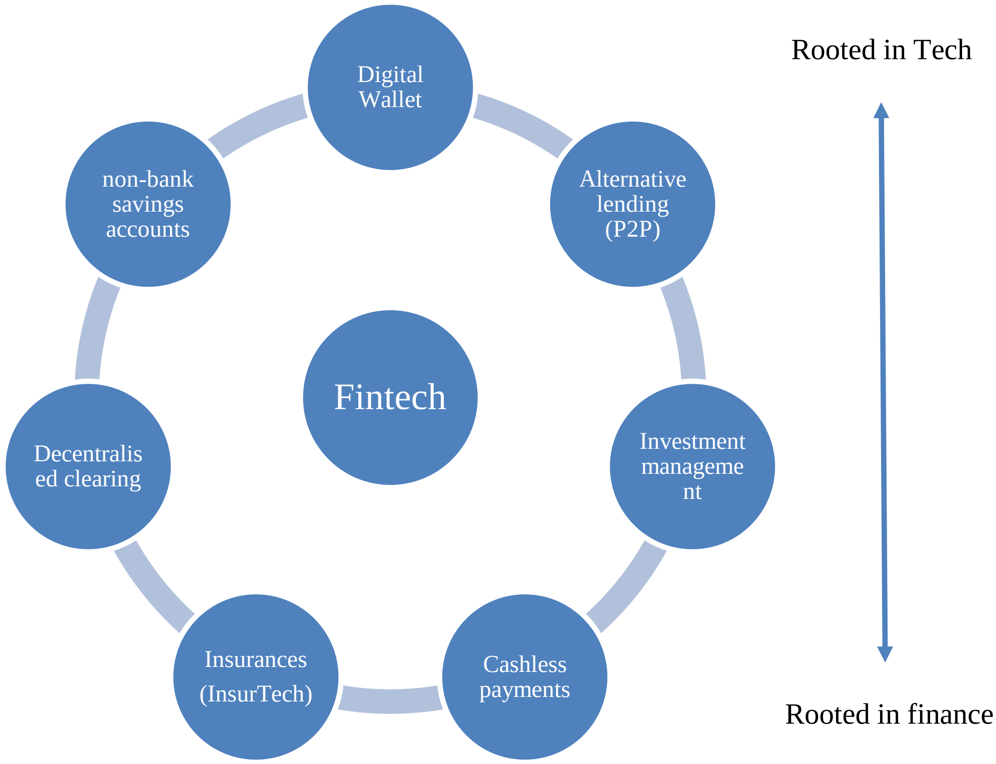
I. FINTECH AND ITS IMPLICATIONS

Globally we are seeing that FinTech has been developing, with varying degrees of sophistication per location. FinTech initiatives have been developing around different fields, mostly focused on consumer or SME services. The digital wallet as developed by different companies such as PayPal might be most familiar to the general audience. An amount of money can be deposited in order to pay for products that would be difficult to buy through traditional methods, such as overseas payments. However, payments are affected on a much broader scale by FinTech. In an increasing amount of countries FinTech is also integrated in offline payments, often through scanning of QR or the more advanced 2D codes with a smartphone or making use of NFC technology. Other FinTech initiatives concentrate not so much on payment, but more on providing financial resources. This can be seen in the emergence of Peer-to-Peer ('P2P') lending and crowdfunding. The companies provide a platform where the needs of individuals and SMEs to either invest or loan money can meet, the complete process, and security needed in order to have a system that works well and is transparent about the risks involved.

In the field of security the FinTechs can also play a large role, especially as more and more financial activities are performed digitally. Through various techniques such as blockchain, FinTechs can ensure that transaction will be performed securely without an additional burden to the consumer or sole reliance on a central institution such as a central bank. This form of decentralised procedures will be discussed in chapter III.

Additionally, technology companies are more involved in fields that were once purely for financial institutions. Examples are managing investments, where often an algorithm will decide on investment opportunities within split seconds; clearing payments, whereby a payment does not need to go through a central authority such as a bank anymore to be received by the merchant but can go through the systems of the FinTechs whereby they provide protection of sending and receiving; creating savings accounts, and even insurance. This list is all but exhaustive, but provides a compact overview of the different FinTech activities currently at play. Figure 1 shows what activities are categorised as FinTech in this thesis. The figure is based on different subjects that come up in literature as being relevant and able to disrupt the financial market. Different categories are sorted from more tech related towards more finance related. Tech related examples often stem from tech companies and also find their uses in the financial market, but are not solely focussed on this market. A digital wallet stems from tech companies wanting to enable payments for goods with digital currency, but this did not have the immediate focus of affecting banks. On the other extreme, digitization of insurances is a purely financial product, which did not have the aim of affecting the tech market initially. Now we see that all of the examples mentioned are affecting both the tech and the banking world.

Figure 1: important technological and financial developments categorised under FinTech



I.1. Development

But what has sparked the FinTech revolution? This differs per country as non-bank financial activities have developed in different manners around the globe. In Europe and the US, progress accelerated through the 2008 financial crisis.[24] It became painfully clear that the method of banking at the time and the associated risk could not stand the test of time. A major collapse in banking and investment industries followed. These events sparked several factors to align in order to create rapid developments in the FinTech industry post crisis.[25] First, the collapse of the economy and the events leading up to this crisis made citizens distrust banks to keep investments safe. The public perception of banks deteriorated as bankers violated protections that they were obliged to give consumers. It showed the public that banks often did not act in the public's interest at all. Second, the economic crisis did not only hit homeowners with a mortgage and other customers of banking products, but the bankruptcy of several banks and the overall diminishing economy left a lot of people jobless. The ex-banking employees were qualified to set up new opportunities for themselves and to see that the crisis also opened up opportunities for alternative investment companies to step in. This ensured that people with the right economic and financial skillset now contributed to the success of FinTech.

A last and major contributing factor for the FinTech industry was the post-crisis aim of regulators to make finance safer. Globally, the *Basel III* requirements were put in place in order to ensure that banks were regulated more stringent in order to prevent a next crisis from happening. The US fully implemented these capital requirements in July of 2013[26] the law is kept up to date with implementations in other final rules to improve the resilience of the US banking system through prudential rules, e.g. for total loss-absorbing capacity

[24] Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?' p. 15
[25] Ibid p. 17
[26] Board of Governors of the Federal Reserve, *Federal Reserve Board approves final rule to help ensure banks maintain strong capital positions* (2013)

requirements, debt requirements, barring a subset of financial companies from entering into certain financial liability, etc.[27] In Europe, directives and regulations ensure and oblige members to implementation of these financial requirements.[28] These restrictions in banking activities also invite criticism, especially claiming that they only impose more costs on financial institutions while not regulating other contributing factors to the crisis such as the credit rating agencies[29] and that they benefitted the large financial institution to the disadvantage of financial institutions that are smaller and have less ties to the regulatory committee.[30] The disadvantages for the banks remain; all of these extra regulations, while protecting the economy, do bring with them high additional costs of compliance. Further, they increase the need for banks to develop and innovate into other financial products. Restrictions on banks enabled a competitive advantage for FinTechs as not all regulations applied and regulation to combat the aforementioned unemployment (such as the 2012 JOBS Act) often made it easier to obtain the funds necessary to start up a business. These funds could be collected from a broader range of financing options, sparking the growth of P2P lending in the United States. These circumstances ensured that FinTechs could thrive in countries affected by the Global Financial Crisis.

Also in other parts of the world the banking system is losing the popularity it once had. The 2008 financial crisis might not have been the primary source of this negative spiral there[31], but other causes were just as effective. In the Asian market, the banking system largely established after World War II has introduced many forms of financing, but has left SMEs often short of credit, frustrating their expansion and innovation.[32] A main characteristic that sets the Chinese banking system apart from other systems such as in the EU and US is that the banking sector consists for the largest part out of State Owned Enterprises ('SOEs').[33] While these big, creditworthy, enterprises could receive loans in order to invest and grow business even further, others were excluded. Because of the demand for funds of this excluded group, other systems emerged to still satisfy the financial needs of SMEs, regular consumers and certain industries that banks are prohibited from lending to. Alongside the formal banking system an informal system emerged. This system has lower protections in place of financial and legal nature[34] and is generally called the 'shadow banking' system (as coined by McCulley of PIMCO in 2007[35]).

Shadow banking is defined as 'credit intermediation involving entities and activities (fully or partially) outside the regular banking system'[36]. Depending on the measuring method[37] the shadow banking system could entail

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[27] Board of Governors of the Federal Reserve, *Federal Register Volume 82, Issue 14 (January 24)* (2017) Office of the Federal Register

[28] Especially Capital Requirements Directive (2013/36/EU), (2013) and Capital Requirements Regulation (CRR) - 575/2013, (2013)

[29] Daniel Agyapong, 'The Eurozone Currency Crisis: A Lesson for the West Africa Monetary Zone' (2012) 1 Asian Journal of Business and Management Sciences 11 p. 15

[30] Ranjit Lall, 'From failure to failure: The politics of international banking regulation, Review of International Political Economy' (2011) 19 Review of International Political Economy 609 p. 626-628

[31] Hui Huang, 'Institutional Structure of Financial Regulation in China: Lessons from the Global Financial Crisis' (2010) 10 Journal of Corporate Law Studies 219 p. 228-230

[32] Moha Asri Abdullah, 'Small and Medium Enterprises (SMEs): Some Pertinent Issues' in Asri Abdullah and Isa Bin Bakar (eds), *Small and Medium Enterprises in Asian Pacific Countries: Roles and issues,* vol 1 (Nova Publishers 2000) p.

[33] Kumiko Okazaki, *Banking System Reform in China: The Challenges of Moving Toward a Market-Oriented Economy* (RAND National Security Research Division, 2007) p. 41

[34] Franklin Allen, Jun Qian and Meijun Qian, 'Law, Finance, and Economic Growth in China' (2002) 02 Wharton Financial Institutions Center Working Paper 44 p. 2

[35] A.A.K., 'How shadow banking works' *The Economist,* (2016) <http://www.economist.com/blogs/economist-explains/2016/02/economist-explains-0> accessed 18 February 2017

[36] Financial Stability Board, *Strengthening Oversight and Regulation of Shadow Banking: A Policy Framework for Strengthening Oversight and Regulation of Shadow Banking Entities* (FSB Consultative Documents, 2012) p. ii

[37] Andrew Sheng and Ng Chow Soon, *Shadow Banking in China: An Opportunity for Financial Reform* (1 edn, John Wiley & Sons Inc 2016) p. xxiii

anywhere from 14% to 70% of the Chinese GDP. The most basic definition of shadow banking includes a customer, be it a consumer or a company (often an SME) who invests their money in a non-bank investment vehicle. These investments are gathered in a (state-owned) trust. This trust invests in projects (often high risk / high pay-out). However, state owned does not mean state backed; when the trust would fail people will still lose their money. Traditional banks can play a role, but stay more at the side lines when it comes to generation of revenues on money deposited and risk that comes with the investments. Enterprises who provide such loans – often either non-bank enterprises, companies that are designated by banks to ensure profits (and avoid these loans showing on the balance sheet of the banks) or trusts – cannot guarantee the same amount of protection as banks can, e.g. in the forms of providing a safety net of state-guaranteed deposits or last resort funding from central banks. They therefore seem to invite a lot of risk in the financial market.[38] Adding to this, the regulatory burden on these lenders is also low when compared to the traditional financial system, allowing them to give out loans for lower costs and to a much larger spectrum of clients from different industries. This could therefore account for their popularity even though the investments will often attain a higher risk. The shadow banking system has expanded quickly in the last few years, expanding from $26 trillion dollar in 2004 to $80 trillion 10 years later.[39] Technological changes and developments have aided considerably towards its popularity. Many different initiatives have been started in the last few years, nearly all having the aim to increase the ease of depositing and lending for consumers and SMEs through the use of technology such as smartphone apps. This technological advancement of the shadow banking industry marks the key to success for FinTech.

FinTech is a growing phenomenon that has already changed many traditional forms of business in the financial sector. Four phases in the evolution of FinTech in China are distinguished by Shim and Shin, setting the point of considerable growth from 2003 onwards.[40] Others define the global beginning of FinTech much further before that,[41] as far back as 1866 when technological developments such as the telegraph were used for financial services.[42] While this period did lay the foundation for what would later be called FinTech, this thesis concentrates on the more contemporary history.

I.2. FinTech history

According to Shim and Shin, the FinTech progress in China started before 2003 in a timeframe they call Problematization. Before the 2nd millennium, nearly all FinTech initiatives came from abroad and the innovations on the Chinese market all needed to go through multiple levels of governmental oversight. China was a mostly cash based society[43]; 'Cash is King' was the maxim for China in the 20th Century.[44] This was hampering the growth of internet companies that often required the use of credit cards. For many FinTech start-ups before the turn of the century, clearing payments (ensuring a transaction between two parties as a trusted third party) was one of the biggest hurdles. In 2002 the state provided a solution through the clearinghouse UnionPay. During this time, FinTech was viewed as merely the digital equivalent of the traditional banking system with new risks created by, among others, the distance between a person withdrawing money and the bank (one did not have to be physically present to transfer cash anymore) and higher competition in the market leading to lower thresholds for giving out loans.

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[38] Douglas Elliott, Arthur Kroeber and Yu Qiao, 'Shadow banking in China: A primer' (2015) Economic Studies at Brookings p. 7-16
[39] A.A.K., 'How shadow banking works'
[40] Shim and Shin, 'Analyzing China's Fintech Industry from the Perspective of Actor–Network Theory' p. 172
[41] Thomas Puschmann, 'Fintech' (2017) 59 Business & Information Systems Engineering 69 p. 70
[42] Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?' p. 4
[43] Shim and Shin, 'Analyzing China's Fintech Industry from the Perspective of Actor–Network Theory' p. 176
[44] Karl Wilson, 'Banking on the end of cash' *Asia Weekly* (9 December 2016) <http://www.chinadailyasia.com/asiaweekly/2016-12/09/content_15539438.html> accessed 20 February 2017

The following period ('Interessement' (2003~2009)) saw the rise retail giants such as TaoBao, and the escrow payment method of Alipay. The popularity of Alipay (and through this: of TaoBao) established Alipay as an unavoidable passing point from online financial transactions. However, the state-owned UnionPay refused to work with Alipay, forcing it to negotiate with every bank separately. The growth of e-commerce in this period called for regulation, which came in the form of the *Electronic Signature Law,* China's first e-commerce law.

In 2010~2013, (the Enrolment period) the government first recognised the online payment procedures of these third-party financial services providers. Citizens changed their perspectives as to which party was able to legitimately handle financial services.[45] Licenses for online payment providers were granted to 27 enterprises, ensuring that their activities were under governmental regulation and were fully domestic owned. With China under obligations of the WTO, it needed to adhere to some strong regulations, e.g. breaking up the state owned clearing system from the purely state-owned monopoly it was before.[46] China promised to give up this position and allow foreign competition from August 2015 forward. Banks felt the competitive power of the tech companies diversifying in financial services, which triggered them to become more concentrated on wealth management products: these were less regulated and could therefore be more profitable to the consumer. UnionPay created their own settlement network with mobile operators that could expand their range of services to their already existing consumer base towards financial services.

Mobilization (2014~present): After the success of online and mobile payments, the innovation pace of FinTech only seemed to increase in China. Consumers had a crisis of trust towards the banking system and were therefore even more welcoming to alternative financing through non-banks.[47] The market transitioned towards mobile private banking, eroding the market of traditional banks. The Chinese governments had been keeping up with these development, and allowed private companies to create banks on a trial basis from 2013 onwards. In 2015, several tech companies had actually received permits for operation in this sector. These companies are working purely online and do not have any physical shops, thereby being able to cut costs. Some banks have responded by setting up their own competing branch of online bank, but are held back by the regulatory boundaries that they face. Others try to actively hinder the private banks e.g. by putting limits on the amounts their customers can transfer to certain FinTechs. It seems that the Chinese government wants to encourage FinTechs, but is facing a dilemma. On the one hand they want to encourage growth in the Chinese economy by removing the monopoly position of state-owned banks and leaving room for competition. On the other hand, the government wants to keep quality checks of these services in their own hands and does not want to see a decline in the revenues of state owned banks. A clear example concerns QR payment: the Chinese government halted this FinTech innovation under the pretence of privacy issues, but it was widely regarded as protectionism for its own UnionPay system that would not profit from this new type of decentralised payment.

I.3. Examples

As mentioned above, some Chinese enterprises have grown to become well known examples in the FinTech world. Several companies have obtained large market shares in these emerging industries. Prime examples are Ant Financial services: the financial affiliate of the commercial mogul Alibaba, and WeChat Pay, a feature of the all-encompassing WeChat mobile app owned by Tencent (also described as '(…) a portal, a platform, and even a mobile operating system depending on how you look at it'[48]). Both will be discussed hereunder, as well as the largest P2P platform currently in China: Lufax.

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[45] Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?', p. 15

[46] DS413: *China — Certain Measures Affecting Electronic Payment Services* (WTO Dispute Settlement Body) p. 191-194

[47] Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?', p. 21

[48] Charles Clover, 'Tencent's WeChat dominates China's lucrative messaging app market' *Financial Times* (18 March 2016) <https://www.ft.com/content/aadd256e-d0ef-11e5-831d-09f7778e7377> accessed 18 February 2017

I.3.1. Alibaba/Alipay/Ant Financial Services

Founded in 1999, the company has been quick to become the world's largest retailer[49], surpassing RMB 158.27 billion (€20.46 billion) in revenues in the fiscal year ending March 31st 2017[50] and generating a record RMB 120.7 billion (€16.2 billion) in sales on 11 November 2016, when the annual Single's Day was celebrated[51]. The requirements for obtaining third party payment ('TPP') licensing in 2010 under the *Measures for the Administration of Payment Services of Non-financial Institutions* lead Alibaba to spin off its financial branch Alipay. Alipay provides financial services in the form of an escrow account, holding the funds of a consumer and affording security between the buying and selling party. After the not uncontroversial[52] split from Alibaba, Alipay focussed on the SME market and extended its alliances with various Chinese banks. The relation between UnionPay (the governmental clearing service) and Alipay (essentially providing the same service without governmental interference) has been suboptimal. After the granting of licenses TPP providers such as Alibaba continued to grow rapidly, but Alipay was forced to stop its Point-of-Service products that the company provided to small brick-and-mortar companies as UnionPay demanded Alipay would use their system and pay the subsequent rates. Alipay was rebranded to Ant Financial group in 2014, but still owns the Alipay payment platform. The relationship between Alibaba and the Chinese government became somewhat better in the following years, with Ant Financial receiving approval to set up another financial branch in 2013 called Yu'e Bao. This money market fund is able to provide interests that are often tenfold higher than the 0.35% Chinese citizens would receive on a regular savings account at a traditional bank.[53]

I.3.2. Tencent

Tencent entered the financial services industry as part of a diversification strategy setting up various internet services such as a social network, mobile games, a chat app (WeChat), etc. The company is one of the biggest internet companies globally with revenues of RMB 102.9 billion (€17.83 billion).[54] Tencent introduced its financial services as an added feature to its widely used chat app WeChat. Of the large FinTechs, it was the first one to launch a bank. At 18 January 2015 Tencent founded WeBank, operating solely online. The success of the financial services can be attributed to many factors with two main contributors. First, the interconnectivity of all services ensures that people are embracing the whole Tencent ecosystem with an app that can do virtually everything (from communicating with your infant child and replacing email, to paying for taxis, book holidays or hospital appointments, etc.).[55] The second factor was the digitization of the 'Red Envelopes' in which Tencent has played a key role next to Alibaba.[56] This tradition of sending such envelopes dates back very far and is ingrain in Chinese society. Chinese people give each other these red envelopes during certain celebrations such as New Year. In 2014, Tencent enabled users to send the envelopes containing money through the WeChat app as an in-app functionality. It became an instant success, with over one billion envelopes sent during New Year's

[49] Meng Jing, 'Alibaba becomes the world's largest retailer' *China Daily* (6 April 2016) <http://www.chinadaily.com.cn/business/tech/2016-04/06/content_24315726.htm> accessed 24 March 2017

[50] Alibaba Group, *Alibaba Group Announces March Quarter 2017 and Full Fiscal Year 2017 Results* (Alibaba Group 2017)p. 2

[51] Louise Lucas, 'Alibaba's Singles Day sale worth record $17.8bn' *Financial Times* (Shenzhen 11 November 2016) <https://www.ft.com/content/8aa13ac6-a7b1-11e6-8b69-02899e8bd9d1> accessed 24 March 2017

[52] Kathrin Hille and Joseph Menn, 'Alibaba settles Alipay dispute with Yahoo' *Financial Times* (29 July 2011) <https://www.ft.com/content/40a66dd2-b9ec-11e0-8171-00144feabdc0> accessed 21 February 2017

[53] Trading Economics, 'China Deposit Interest Rate 1990-2017' (2017) <http://www.tradingeconomics.com/china/personal-savings> accessed 25 May 2017

[54] Tencent Holdings Limited, *Tencent Announces 2015 Fourth Quarter and Annual Results* (2016)

[55] The Economist Print Edition Business, 'WeChat's world' *The Economist* (Shanghai 6 August 2016) <http://www.economist.com/news/business/21703428-Chinas-wechat-shows-way-social-medias-future-wechats-world> accessed 24 March 2017

[56] Ronit Ghose and others, *Digital Disruption - Revisited* (Citigroup Global Perspectives & Solutions Report Series, 2017) p.

Eve, as compared to 240 million through Alibaba's competing app[57]. That year, Tencent clearly won the 'Red Envelope War'. This tradition of WeChat 'Lucky Money' has been continuing hereafter and only grew in size and geographical scope, e.g. expanding to Times Square during Chinese New Year.[58]

I.3.3. Lufax

These two are not the only firms that now engage in FinTech on the Chinese market. Enterprises such as Lufax are concentrating on other segments of the financial services, for instance P2P lending. Lufax has, in 6 years, managed to create the largest P2P platform in the world with a valuation of €17.1 billion after a series B investment round in January 2016.[59] The company provides an opportunity for supply and demand of investment to meet and safely be transacted. Lufax is backed by Ping An Group, one of China's largest civilian-run financial services companies. They are able to guarantee the loans, thereby easing the – sometimes justified – inherent scepticism that both Chinese citizens and others abroad have towards these platforms as the default rates tend to be considerable. Lufax surpasses its US based peers easily with at least double the valuation. Despite its success, it is diverting its resources towards other FinTech activities such as retail investing, where consumers can put their funds in the stock market, mutual funds, or products with a fixed income.[60] It now enters the terrain of aforementioned giants such as Alibaba and Tencent, where it can expect fierce competition.

These examples show that the emergence of FinTech comes from different angles, and companies cannot readily be compared when it comes to history and timeline. Banks should therefore be aware of a broad range of new FinTechs and act accordingly.

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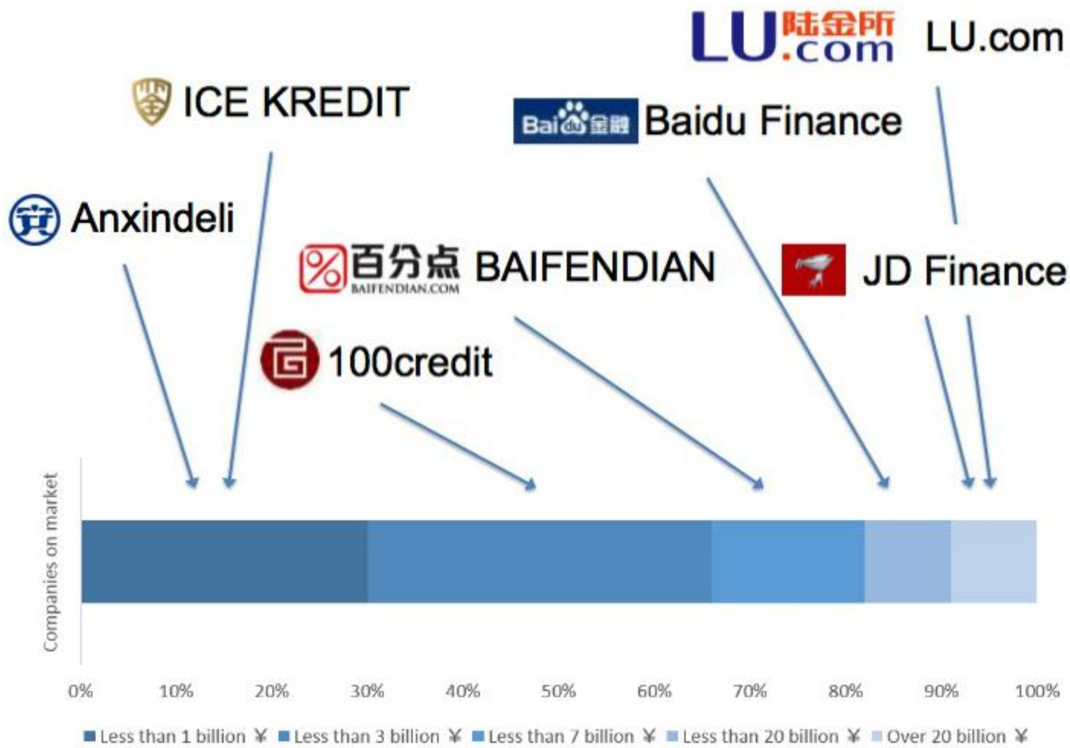
[57] Na Chen and Pei-Luen Patrick Rau, 'Group Participation Influence on Members' Gifting Behaviors in a Social Game' in Pei-Luen Patrick Rau (ed), *Cross-Cultural Design 8th International Conference, CCD 2016* (Springer International Publishing AG 2016) p.
[58]Robin Christie, 'WeChat cashes in on Chinese New Year' *Asia-Pacific Banking & Finance* (9 February 2016) <http://australianbankingfinance.com.au/asian-markets/wechat-cashes-in-on-chinese-new-year/> accessed 24 March 2017
[59] Liza Lin and Alec MacFarlane, 'China's Top P2P Lender Pivots Away From the Business' *The Wall Street Journal* (22 February 2017) <https://www.wsj.com/articles/chinas-top-p2p-lender-pivots-away-from-the-business-1487767790> accessed 24 March 2017
[60] Ibid

Figure 2: Market share of different categories of FinTechs and some examples



Source: Selina Yang and others, KPMG 2016 China Leading Fintech 50 (KPMG China, 2016), p. 9

What we can conclude from the above described developments is that the influence of the Chinese state on all financial activities is still considerable. Because of the lax attitude towards FinTech regulation, the government allowed the companies to grow to their too-big-to-fail status. However, the government has shown that it is willing to take drastic measures when the FinTechs are not behaving in the manner envisioned by the state and are threatening governmental revenues through taking away financial activities from incumbents. It seems that this manner of regulation does not really work for the FinTechs as they continue to grow, thereby not afraid to make full use of the space afforded to them through inappropriate and vague regulation. The problems seem clear, but how can they be solved? This will be discussed further.

II. Analysis of the Chinese Banking industry, FinTech effects and consumer Benefit

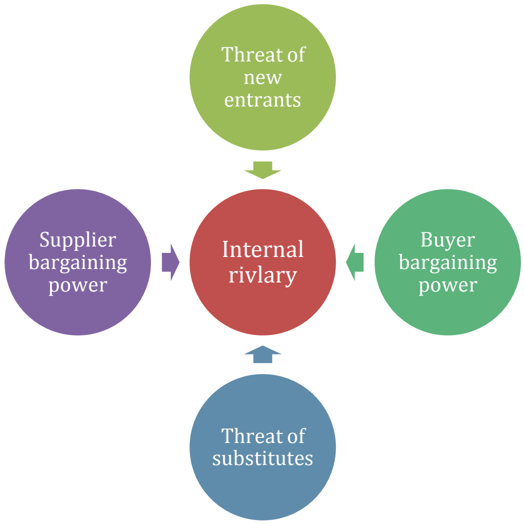
The government still tightly regulates the current banking system in China. The history of the emergence of the banks shows that governmental influences have been at the root of every major change. In the last three decades, the banking system has undergone some major changes coming from a mono-banking system as was the regular form in the Soviet area before 1978, to the more market oriented multi-bank system that it is now.[61] Still, the government owned banks command the lion's share of the banking sector with other small joint stock banks and non-state owned banks following very far behind with a minute market share.[62]

This chapter will assess different influences on the financial market, characteristics of both traditional banks and FinTechs, and their effect on the competitiveness of the market and ultimately on consumer benefit. To

[61] Okazaki, *Banking System Reform in China: The Challenges of Moving Toward a Market-Oriented Economy*, p. 7-8
[62] Huang, 'Institutional Structure of Financial Regulation in China: Lessons from the Global Financial Crisis', p. 232

analyse whether the market of financial services has become more competitive, we will look at how the amount of competition in this market has changed with the recent developments. To describe the forces that play a role on the market, Porter's five forces model will be used, as shown in Figure 3.

Figure 3: Porter's Five Forces Model



II.1. Threat of substitutes

One of the major ways in which the emergence of FinTech disturbs the financial market and increases competition is the fact that these companies can give alternatives to the traditional financial products in the market. FinTechs can therefore be seen as supplying substitutes that do not share the characteristics of regular financial products and are therefore better able to make use of market opportunities. The emergence and success of the substitutes in the market is due to several reasons.

The ease of use is one of the selling points of FinTechs. They use different techniques to make payment between consumer and merchant progresses as swift and secure as possible. It has already become evident that traditional banks are facing difficulties when it comes to customer relationship management because they fall behind to the FinTechs that provide much more tailored and easy to use services.[63] One of the initiatives is using QR codes to perform instant transactions. Through this technique, every phone equipped with a camera and the app of the payment provider is able to perform the transaction for the consumer. During the ban on this form of payment, FinTechs focussed more on NFC-techniques where payment only required holding the phone close to a payment terminal. The ease of use makes people more inclined to use the services. This only broadens the gap with traditional banks, who have an image of being bureaucratic and not focussed on quality for consumers and SMEs.

As the Chinese government has allowed the use of 2D payments (a pattern system that builds on the QR codes) again after halting this development for the risk of fraud and privacy, the industry will likely pick up again. Besides giving ease of use to both consumer and merchant, FinTechs also stand to benefit. Through this payment method they are able to cut out the middleman and avoid the use of a traditional clearing house. This will further the demise of any dependence on the state-owned UnionPay.

[63] Kotarba, 'New Factors Inducing Changes in the Retail Banking Customer Relationship Management (CRM) and Their Exploration by the Fintech Industry', p. 3

Giving customers more profitability on their investments and minimizing costs of lending through keeping interest low is another major selling points of the FinTechs and a prime reason for their competitive position. As they can offer more attractive investment opportunities, people will be more drawn to invest there and overcome the increased risk that such an investment may bring. These advantages in rates are caused largely through the governmental regulation that provides caps on both interest given out and charged for traditional banks. These and other regulations affecting the current and future financial market will be discussed in chapter III.

Traditional banks and the government tend to lend more to SOEs because of ownership bias: they value the enterprise higher based on owning it themselves. Usually risk is underestimated while performance is overestimated. Through the favouritism in funding the phenomenon becomes a self-fulfilling prophecy as SOEs get more opportunities and often will perform better than private firms who do not receive the same funding. It is estimated that 70 per cent of SMEs and individuals do not receive adequate financial services. This only leaves the opportunity to go to the informal funding markets, where the costs of funding are at least four times as high compared to the formal sector.[64] This leaves the private sector considerably underserved. FinTechs can provide larger legibility of customers for such loans and therefore might provide consumers with a lack of credit history or companies that are just starting up, or customers that are not able to provide the required collateral, to still receive funding. This can be a boost for the economy as it allows these companies to grow past their start-up phase and into a labour demanding business. Consumers are also able to spend more, thereby creating a higher consumption. This larger legibility of course also provides downsides, as there are reasons why these customers are not able to get a loan with a traditional bank. Often the risk is much higher and the rate of default is accordingly above average. Regulation tries to mitigate the losses that banks have to incur, but thereby do isolate a large part of Chinese citizens.

Another reason why consumers and SMEs choose for non-bank loans is the focus of traditional banks on short-term loans. Globally, banks are going in this direction because of the *Basel III net stable funding ratio* which will require banks to keep a stable balance between all financial activities, thus reducing the risk of one diminishing income source disrupting the entire bank.[65] Legitimate as this may sound, it requires banks to have the assets at hand in order to create balance which then cannot be invested long-term. Long-term loans are not very attractive for banks because it means that this money will be outside the company for an extended period of time, not to be used for the balancing of funds. Especially Chinese banks are getting the money they loan from deposits[66], thereby putting the consumers at risk in case of a major rise in non-performing loans. Their need to keep to the balance is even more urgent as they need to abide to the *1995 Commercial Banking Law* that caps the loan-to-deposit ratio to 75% for banks. This leaves customers that require long-term loans, e.g. for setting up a company, isolated. It further fuels shadow banking, as the banks try to circumvent rules by leaving loans off their balance sheet.

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[64]Yiping Huang and others, 'Can the Internet Revolutionise Finance in China?' in Ligang Song and others (eds), *China's New Sources of Economic Growth*, vol 1 (ANU Press 2016) p. 124

[65] Basel Committee on Banking Supervision, *Basel III: the net stable funding ratio* (Bank for International Settlements 2014) p. 7-8

[66] Christopher Langner, 'China's Maturity Problem' *Bloomberg Gadfly* (22 June 2016) <https://www.bloomberg.com/gadfly/articles/2016-06-22/china-s-maturity-problem> accessed 24 March 2017

II.2. Threat of new entrants

The Chinese financial market was historically populated by only a few big players. One could even argue that there is in fact only one big player in the form of the government because the biggest banks are all majority state-owned.[67]

Competition can increase in the future through new entrants. At the moment, the CBRC has given out five banking licenses to FinTechs in order to perform certain banking activities.[68] This started as a pilot project in 2014, where WeBank (the Tencent financed online-only bank) was the first to commence with the aim of providing individuals and SMEs with loans. In *the Notice of CBRC on the Guidelines for Promoting the Development of the Wholly Privately Owned Banks* the government set out the structure of receiving such license for an online-only banking license. The amount is steadily growing, as in 2016 12 banks were being reviewed that are privately owned and seek a banking license.[69]

Even though FinTech is hailed as the new form of doing finance for many consumers and SMEs, there are still some large hurdles to be taken in order for these companies to be able to directly compete with traditional banks. Already in the US market these companies face regulatory problems when trying to expand to other fields of business, which will only be emphasized in a more stringently regulated country such as China. Many FinTechs are currently only serving a very small part of the total financial services needed in a country. The large American FinTech company Lending Club can be taken as an example here. They arrange small debts totalling the equivalent of 1% of the total credit card debt in the US.[70] This problem is less prevalent in the Chinese market as the market penetration of FinTech is already much higher. It is estimated that consumer banking, fund transfer and payment will be emerging industries with a high growth potential for the coming years.[71] This can change the situation, but in the current market it is still the case that banks are larger than the FinTechs when it comes to the overall financial industry.

The other competitive problem with such large market shares for traditional banks is the network effect. These banks can use their large client base in order to retain their consumers. This can e.g. happen when people get some benefit of having friends and family also sign up and are penalized when switching. Also, the costs of operation will be divided under more customers through which the banks keep their costs low and will be able to compete closer to the price level of the FinTech company when this would be needed to compete with them in the future.

FinTechs are now especially focussing on the less regulated parts of financing, whereby the standards to which they will need to adhere are substantially lower than in other parts of the financing industry. Other markets that are more regulated, such as insurance and investment banking are predicted to be less affected by FinTechs in the coming years.[72] These activities are much more stringent in their regulation as they see the need of protecting the consumers and to see upon market transparency. One of the reasons for this focus on SME and consumer

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[67] Grant Turner, Nicholas Tan and Dena Sadeghian, 'The Chinese Banking System' (2012) September 2012 Reserve Bank of Australia Bulletin p. 54

[68] EY commissioned by HM Government, 'China and UK FinTech' (2016) p. 8

[69] Dongyue Chen and Xingyu Wu, 'China', *Banking Regulation 2016*, vol 3 (Global Legal Insights 2016) p. 3 <https://webcache.googleusercontent.com/search?q=cache:E754WmPeRL4J:https://www.globallegalinsights.com/practice-areas/banking-and-finance/global-legal-insights---banking-regulation-3rd-ed./china+&cd=1&hl=nl&ct=clnk&gl=nl> accessed 24 May 2017

[70] S.P., 'Why fintech won't kill banks | The Economist'

[71] Manoj Kashyap, Haskell Garfinkel and John Shipman, *Blurred lines: How FinTech is shaping Financial Services* (PwC Global FinTech Report, 2016) p. 7

[72] Ibid

markets is that it allows FinTechs to circumvent the regulation that have once been set in place to keep traditional banks at bay, but are often not able to regulate FinTechs in these fields. This lack of adequate regulation has left a regulatory vacuum in which FinTechs are under- or even unregulated, leading to different scandals and controversies surrounding FinTechs in the fields of consumer and SME financing. Examples of these are to be found in P2P lending initiatives, where in China one third of the lending programmes (approximately 1,000 platforms) have been categorised as problematic.[73] The definition of problematic is given as including cases where the platforms engaged in fraudulent behaviour or going bankrupt. Of these problematic platforms, more than 50% took advantages of lax regulation in their particular industry or loopholes that were exploited as to avoid regulation. The risk of platform default has a major backlash on SMEs, as their riskiness of not being able to acquire the necessary funding increases. Were the FinTechs to expand to markets with stricter regulation, their growth might not be as rapid as it has been in less regulated environments. They could potentially run into regulatory barriers that are strict enough to also regulate FinTechs.

To account for the abovementioned problems, some FinTechs are moving towards a business structure that does the opposite of most of the advantages that have been mentioned before about disrupting the traditional financial markets and forcing banks to either change or be eliminated in the long run. To be able to move into other financial markets and to regain a notion of trust from the consumers after the scandals, FinTechs are working together with banks in order to form collaborations to make the best use of the individual's strength.[74] These collaborations merge the existing industry with the new FinTech disruptions, whereby the banks can take care of the financial handling of certain transactions, and FinTechs are better suited to focus on the digital platform that can be created for the joint venture. An example of this is the collaboration between the Postal Savings Bank of China on one side and Ant Financial and Tencent on the other in order to make the process of opening a bank account more user friendly.[75] Companies from all over the globe indicate that the main manner in which they cooperate with a FinTech company is through a partnership (with 'not dealing at all' coming a close second, right before 'only buying and selling services').[76]

An example in Europe is the partnership of the Danish Danske Bank with crowdfunding company Invesdor to especially focus on the SME sector the latter is currently serving. Danske Bank is also creating its own FinTech Company by spinning off their mobile payment subsidiary into a separate business to allow other Nordic banks to implement the same software in their own systems to create a more uniform experience for the consumer.[77] We further see that in these Nordic countries investments have been made towards collaboration between banks and FinTechs where FinTechs provide a service for incumbent customers and rely on the banks to provide the core of the business. However, much more investments (4 times the amount in the 2014-2016 period) has been done in companies that aim for a co-opetition role. In this latter role the FinTechs do rely on the infrastructure that is already provided by the banks in terms of loans, savings accounts and transaction systems, and do work together with banks to create new knowledge and to research new products while retaining competitive elements in their relationship. Banks and FinTechs compete for the users of the products created by the knowledge generated from the partnership.[78] Other examples can be found in Japan, where the regulator allowing

[73] Sidney Leng, 'One third of China's 3,000 peer-to-peer lending platforms 'problematic': new report' *South China Morning Post* (24 September 2016) <http://www.scmp.com/news/hong-kong/economy/article/2022317/one-third-Chinas-3000-peer-peer-lending-platforms-problematic> accessed 24 March 2017

[74] Mittal and Lloyd, *The Rise of FinTech in China - Redefining Financial Service*, p. 25

[75] Ibid, p. 25

[76] Kashyap, Garfinkel and Shipman, *Blurred lines: How FinTech is shaping Financial Services* p. 26

[77] Frida Jonsdottir and others, *FinTech in the Nordics* (A Deloitte review, 2017) p. 25

[78] Bruce Weber, 'FinTech: Reshaping Banking with Co-opetition and Disruption' (Sibos 2016 by SWIFT, Geneva) p.7

partnerships between FinTechs and banks has sparked a rapid increase in such partnerships as the Japanese banks are trying to catch up with their western competitors.[79]

Benefits of this collaboration exist on two sides. On the one hand banks can benefit from the reach of FinTechs to individuals who do not yet have a bank account. Further, they will be able to use the extensive data gathering of FinTechs to better serve their clients or develop products that better align with customer needs. On the other hand, FinTechs also benefit from these collaborations. FinTech banks often lack physical branches where people can meet employees face-to-face. While this might often not be a problem and is even a contributing factor of the success of these companies as it keeps costs down, it can lead to some disadvantages. One of the major hurdles that FinTech banks need to overcome is the regulatory requirements that have been tightened after a crisis of trust in P2P programmes. Regulation, which will be discussed in chapter III, is in place to make sure that both investors and people providing investment opportunities are legitimate. The method through which this is achieved is by requiring personal verification to open a Class I bank deposit account, often needed to participate on the FinTech market. The FinTech banks will be able to use the traditional banks' offices in order to meet this requirement.[80] Further, traditional banks have in some cases a higher level of trust from the consumers, as they are established banks that have been around for quite some time and are government backed. New initiatives might become more popular as much of the threat of investing in something unknown is taken away because a trustworthy entity is willing to collaborate. This trend of collaboration is not only sparked by the willingness of FinTechs to become more trustworthy to consumers, but is in some cases also a requirement of Chinese regulation.

The difference between these partnerships in China and in the US or Europe is mainly that the banking systems of the latter already provided for all customers, while the Chinese system largely let the SME and consumer market without financial options. The motivations of banks might therefore be different, as EU and US banks will see the partnerships as a manner of cost savings and giving added consumer ease of use, the Chinese banks look more to new markets becoming profitable and secure, therefore more accessible to fund.[81]

Even though financing forms such as credit cards are not very popular in the Chinese market, it is predicted that comparative products will come to the Chinese market, together with consumer loans and other forms of financing consumers and companies of small and medium size.[82] Other expansions will likely happen in the market of business financing. At the moment, focus is on consumers and their financing needs, but businesses are also more willing to lend from FinTechs. These companies have the advantage of being able to customise a loan to the specific needs of an SME based, among other factors, on a large amount of data concerning this specific company and many alike. This market also seems to be underserved, as they currently only receive 20-25% of the loans provided by traditional banks, while they constitute up to 60% of Chinese GDP and employ 80% of the population in urban areas.[83]

II.3. Supplier bargaining power

Two different kinds of suppliers can be distinguished for banks, both supplying funds but on a different level. The first is the supplier of financial resources in order to provide loans to others: the investors in deposits. This

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[79] Asian Nikkei Review, 'In fintech push, Japan's megabanks eye overseas money transfers' *Asian Nikkei Review* (Tokyo 4 September 2016) <http://asia.nikkei.com/Business/Trends/In-fintech-push-Japan-s-megabanks-eye-overseas-money-transfers>
[80] Mittal and Lloyd, *The Rise of FinTech in China - Redefining Financial Service* p. 25
[81] Prof. Dr. Roger Kiem and others, *Global trends in fintech dealmaking* (White & Case Publications & Events, 2016) p. 1
[82] Joseph Luc Ngai, John Qu and Nicole Zhou, *Disruption and Connection: Cracking the Myths of China Internet Finance Innovation* (McKinsey Greater China FIG Practice, 2016) p. 17
[83] Mittal and Lloyd, *The Rise of FinTech in China - Redefining Financial Service*, p. 13

group, even though actually supplying money to the banks to give out other loans, are for this thesis seen as consumers (buyers) of financial products, such as either a mortgage or a deposit account. They will therefore be discussed under 'buyer bargaining power'. The other group consists of investors in the banks that take a stake in the company and search for a positive return on investment.

In the pre-1978 time period, China held onto a mono-banking structure, with the People's Bank of China ('PBoC') as the only bank. All banks were included in one state-led hierarchy.[84] Hereafter, the banking reform transformed SOE budgets into bank credit and created the state-owned banks we now know as the 'Big Four'. In the 1980s join-stock banks were set up which included foreign and domestic funds as well as governmental capital, after which in early the 1990s banks became listed on stock exchanges and therefore ownership became more dispersed. Later, many rural banks were set up that were often funded by the state or SOEs, but occasionally by private equity. The banks all suffered from a large amount of non-performing loans. To mitigate this, the government has invested large amounts of additional funds especially in the 'Big Four' banks as well as distributing the non-performing loans to other entities.

Government backed actors seem to move away from the ownership bias that has marked their historic investment decisions[85] and towards companies like Ant Financial. In order for FinTechs to grow, they need the funds to finance this expansion. Many Chinese FinTechs are raising money through funding rounds in exchange for equity. The unicorn Ant Financial has raised capital in a series A round of an undisclosed amount through investors such as China's National Social Security Fund ('NSSF'), China Development Bank Capital and major insurance companies in July 2015.[86] For NSSF this was the first direct investment; they disclosed to have a 5% share in Ant Financial. Less than a year later in April 2016, the company held a series B round worth $4.5 billion. The second round valued the entire company on around $60 billion. Large investors in this round were the China Construction Bank and the China Investment Corporation ('CIC'). Through these two rounds we can see that the traditional banking sector does want to merge into new markets with investments into new technologies. Next to that, Ant financial seems to be a good investment, raising in value from $45 billion in the first round to the aforementioned $60 billion in the second.

Large shareholder interests can combat shareholder dispersion and thereby the diminished controlling powers over the company. A large shareholder is in a better position to monitor management decisions and is incentivised to grow a firm's profitability as the benefits they reap from this are considerable.[87] Nonetheless, a strong governmental influence in a company could potentially lead to adverse consequences because the public interests could be divergent from business goals e.g. in the fields of job creation or political influences that lead to suboptimal acquisition of human capital.[88] As both the NSSF and the CIC are deemed governmental controlled Sovereign Wealth Fund (even though only the CIC is officially acknowledged as being owned by the Chinese state[89]), Ant financial could suffer from the adverse consequences a large government controlled shareholder could bring. Nonetheless, studies show that the CIC will not exert its influence in companies in

[84] Xiaochi Lin and Yi Zhang, 'Bank ownership reform and bank performance in China' (2009) 33 Journal of Banking & Finance 20 p. 21

[85] Allen, Qian and Qian, 'Law, Finance, and Economic Growth in China' p. 10 indicate that the credit-to-GDP-ratio of Chinese banks drops from 1.3 to 0.24 when excluding SOEs and collective-owned companies in the year 2000

[86] Charles Clover, 'Ant Financial valued at $45bn after fundraising' *Financial Times* (Beijing 19 June 2015) <https://www.ft.com/content/dcd9fc62-1638-11e5-a58d-00144feabdc0> accessed 24 March 2017

[87] Jing Li, 'State as an Entrepreneur: A Study of the Investment Contractual Terms and Level of Control of China's Sovereign Wealth Fund in Its Portfolio Firms' (2015) 3 Peking University Transnational Law Review 1 p. 18

[88] Ibid, p. 20

[89] Iacob N. Koch-Weser and Owen D. Haacke, 'China Investment Corporation: Recent Developments in Performance, Strategy, and Governance' (2013) US-China Economic and Security Review Commission p. 7

which it has a large share and refrain from shareholder activism. The CIC has, in line with its usual investments, not obtained a controlling stake in Ant financial. Often their voting rights are very restricted, ensuring low formal governmental interference.[90] In the field of informal control, the CIC often has much more influence because firms become dependent on the governmental investments and the CIC uses the long-term relationship that will be formed after the initial investment to further their own policies.[91] Whether this is the case for Ant Financial remains to be seen when the long-term results of the investments will surface.

These large investments give room to fuelling growth and expansion into other services. It seems that the Chinese government is here furthering their policy of creating a national champion. They are succeeding in their aim as Ant Financial is aiming for influence abroad. This can be seen through e.g. their acquisition of the U.S. based Moneygram, a company specializing in cross border payments, for $880 million.[92] The development can be seen from two different perspectives in relation to the level of competition, depending on the market perspective taken. At the FinTech market, the major players have been quick to obtain large market shares, whereby Alibaba and its subsidiaries seem to have won the race in many industries. These large market share enables the dominant firms to create barriers to enter the market.[93] This effect can potentially be amplified now that Alibaba can make use of public funds in order to grow faster, and the Chinese government has aligned interests with the company both on private (receiving return on their investments) as well as public (ensuring the growth of the Chinese economy through broader access to Alibaba's services and expansion abroad of its national champion) fields.

However, when we look at the broader picture, a different conclusion can be drawn. In the market of financial services, it is clear to see that the emergence of Ant Financial brings additional competition. The market was previously populated by state-owned banks and the rest of the financial demand was satisfied by the informal shadow banking system, the latter being suboptimal as the costs and risks are high. With the emergence of companies such as Ant Financial and their steady growth partially funded through state capital, they do create a force to be reckoned with for the incumbent players, and take a lot of the financial services in China from the shadow into the legitimate 'sunlight', thereby creating a less risk bearing environment and benefits for consumers.

The increase of investment opportunities has not only fuelled the FinTech growth, but has also lead to less stable supply in funds for the traditional banks. Their once so high bargaining power over all investors due to the limited investment allowed, has been decreasing fast. The banks now still seem a risk-free investment as government-backed entities usually are, but this could change in the future when banks that do not change will become less relevant. Therefore, the bargaining power of the suppliers is increasing, as their switching costs become much lower.

II.4. Buyer bargaining power

The increase of substitutions in the financial market also has its implications on the role that the consumer plays. The two extremes – choosing for safe, low yielding banks or the risky higher yielding shadow market – have

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[90] Li, 'State as an Entrepreneur: A Study of the Investment Contractual Terms and Level of Control of China's Sovereign Wealth Fund in Its Portfolio Firms' p. 9

[91] Ibid, p. 81

[92] Jon Russel, 'Alibaba's Ant Financial is buying MoneyGram for $880M to expand its global presence' *Techcrunch* (27 Jan 2017) <https://techcrunch.com/2017/01/27/alibaba-ant-financial-moneygram/> accessed 24 March 2017

[93] Philippe Gelis, 'The Oligopoly Defenders (banks) vs. the Monopoly Builders (fintech)'(12 August 2014) <https://www.linkedin.com/pulse/20140812072301-13393229-the-oligopoly-defenders-vs-the-monopoly-builders> accessed 24 March 2017

been complemented by different options. Larger availability makes switching much easier and therefore lowers switching costs considerably. Customers are less dependent on existing distribution channels and can now have access to the financial services provided through innovative means, in extension being less vulnerable to the will of the big banks.

With the burdens of switching to FinTech lowered, banks should react in order for them not to lose entire business segments to the new technology. The first signs of the loss of the consumer segment is already surfacing in China, where a subset of people get their full salary deposited on their AliPay account to use for all of their spending without any bank involvement.[94] Banks react by competing with the FinTechs on quality and price, which will increase consumer benefit drastically. Nevertheless, other options are also available. The banks could cooperate with or acquire FinTechs in order to reduce buyer power and increase the switching costs again. Then a few major players will be able to 'wall the garden'[95] again and make depositing the funds at a competitor very burdensome. Even though this does benefit the convenience for customers in the short run because working in a delimited environment allows for customization and can provide more security, the prime benefit for banks in this strategy is the monetization model of lock-in. This will hurt the consumer in the long run as they will pay the price of their lock-in, both when staying and willing to switch. Further, because the government is so involved in the banking sector, it is not very unlikely for the regulator to step in to order regulation that will decrease buyer power. The latter decrease can either be through forcing people to use the traditional banking system or by putting caps on the amount to be invested in FinTechs, among others. Both of the latter examples are already showing in China, as more banks and FinTechs are starting to work together, and the Chinese government capping investment amounts in FinTech platforms. If these decisions result in actual decrease of buyer bargaining power remains to be seen in the future.

However, the consumers of FinTech products also have become wearier in lending out money because of the P2P scandals that happened in the past. Next to risks of fraud, the investors also run the risk of the companies they invest in going bankrupt, their personal data being breached and published, etc. The regulatory protections that have been placed on the platforms as will be discussed in chapter III do work to mitigate the risks, but can overreach as they will stifle all innovation and sometimes even go as far as outright banning P2P platforms, as several local governments in China have done.[96] In terms of bargaining power these investors have minor influence, as the amounts that they pledge are usually so low and the number of investors is so high that the platforms are not willing to negotiate a separate deal with every investor. Nevertheless, an increasing amount of platforms does make switching costs for investors lower, therefore the threat of investing in another platform becomes more legitimate. This will increase the bargaining power for the buyer in the FinTech industry.

II.5. Internal rivalry

The internal rivalry in this market is fundamentally hampered as most of it is state-controlled. The banks have the same owner and therefore will not be inclined to compete with each other for fear of sparking a race to the bottom. Nevertheless, in the last years there has been some changes in the competitiveness of the Chinese internal financial market. To obtain accession to the WTO, China needed to abide to stringent and drastic reforms in multiple sectors, including banking. A more open attitude needed to be taken regarding foreign banks, even giving full access to all services in 2007. This meant that the Chinese banks were given a 5-year grace period in order to become competitive when outside competition really would start to affect the market.[97] After

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[94] Johan Nylander, 'China going cashless thanks to fintech boom' *Asia Times,* (2016) <http://www.atimes.com/article/china-going-cashless-thanks-fintech-boom/> accessed 24 February 2017

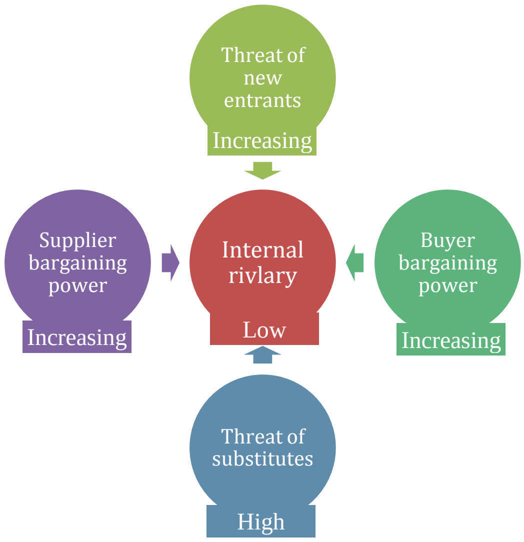
[95] DappDeutsche Bank, *Fintech reloaded - Traditional banks as digital ecosystems* p. 8

[96] Huang and others, 'Can the Internet Revolutionise Finance in China?' p. 116

[97] Javier Serrado and Banco Sabadell, *China's Entry into the WTO and the Financial Sector* (China's Chief representative, 2003) p. 1

this the market shares of foreign banks did increase, but did not have a major effect on competition as foreign banks remained below 1% of the total market share.[98] Also in the market for clearing payments the Chinese industry was forced to open up after WTO accession[99]. Before, the only payment handling company was UnionPay, but after 2001 also other companies such as Visa and MasterCard could enter the market. Yet, these companies have a hard time competing with an institution that has the regulators, its size and infrastructure on its side.[100] The new players that are allowed entry can therefore not increase internal rivalry very much. This shows that the internal market is not very competitive, hindering innovation and cost cutting. Regulatory burdens are in place to avoid players entering the market and increasing competitiveness, whereby the incumbents do not need to worry about their competitiveness at all.

Figure 4: Porter's Five Forces Model as applied to the Chinese financial market



II.6. Bank strategy for the future

What Figure 4 and the above chapter show is that even though the market for banks might be not so competitive at the moment with high barriers to entry, external forces will ensure large disruptions in the very near future. New entrants that focus on the same banking services enter the market who are able to drive prices down and level of services up. More disruptively, consumers find substitutes that aim to restructure the entire financial system. Many substitutes increase bargaining power for consumers; they have not had good options that could substitute the bank financial products as shadow banking brings with it too much risk. FinTech companies can legitimise these activities and therefore decrease risk, giving a viable option to change to. The suppliers of capital also have increased options now that FinTechs are viable investment opportunities, making switching easier and therefore leading to greater bargaining power.

What would the best plan of action be for banks? An option that has already been touched upon is working together in a partnership with a FinTech. Yet, this will to my opinion not be the ultimate solution. As long as the FinTechs need banks, they will be happy to create partnerships. But when this need falls away because the regulatory burdens attaching FinTechs to banks are removed and FinTechs are becoming more popular, banks

[98] Bing Xu, Adrian van Rixtel and Michiel van Leuvensteijn, 'Measuring bank competition under binding interest rate regulation: the case of China' (2016) 48 Applied Economics 4699 p. 4701
[99] World Trade Organization, *Accession of the People's Republic of China* (WT/L/432, 2001) p. 67
[100] Mittal and Lloyd, *The Rise of FinTech in China - Redefining Financial Service* p. 27

will face the consequences. The best plan of action is therefore not entering into a partnership nor try to ride the wave of innovation with others while focussing on the current prime tasks, but to have a major overhaul in strategy and vision for the future. Banks should realize that their role, as big as it has been in the past diminishes very rapidly when they are not able to change their business models.

What do the changes in the financial system do for consumer benefit? It seems that the financial market is getting more competitive, which helps innovation, services, lowering prices and thus consumers. The biggest hurdle seems the 'walled garden' created by the regulators for incumbents, leading to a competitive advantage. This advantage seems very solid at the moment, but can be removed by the stroke of a pen. We therefore now focus on the current regulation and whether it helps or hinders consumers.

III. FinTech regulation, adequate to increase consumer benefit?

Before July of 2015, the Chinese government did not regulate FinTechs very strictly (taking a 'hands-off'[101] approach) in the hope that SMEs would get a better access to their financing needs with these companies. This access would then lead to growth of the SMEs and therefore of the economy and consumer benefit. The hands-off approach entailed that until July 2015, the FinTech market was largely regulated by a combination of the *Measures and Guidelines on electronic banking* of the China Banking Regulatory Commission[102] and the *Administrative Measures for Payment Services by Non-Financial Institutions* as defined by the PBoC in 2010. This amounted to different regulatory institutions each having responsibility over a limited share of the financial services. In addition to this, there were general regulations overriding the powers of the regulatory bodies, exceptions flowing from several pilot programmes and specific regulation depending on whether the products traded or services provided contained foreign parts and whether or not financial companies were allowed to have foreign shareholders. This system was clearly lacking the adequate framework for both domestic companies and foreign FinTechs wanting to enter the Chinese market. Especially the regulating bodies under the China Securities Regulatory Commission did not have the adequate regulation for extending the regulation they provided for asset- and fund management and various different services towards the realm of FinTech firms.[103]

Due to, among others, losses of P2P lending platforms, FinTechs threatening the State Owned banks and increasing non-payment of private lenders, the Chinese government implemented a strict regulatory framework. One of the most important feats for FinTech in the legal field is the judicial interpretation *Provisions on Certain Issues concerning Application of Law in Trial of Cases involving Private Lending* of the Supreme People's Court that entered into force from 1 September 2015 onwards[104], which deemed lending between non-banks and individuals – so-called private lending – legal. Also, lending between non-banks was now seen as a legal act, while before it had been decided that such behaviour was illegal. Restrictions do apply, e.g. on interest rates and the actions that lenders may take. Concerning the latter, it has been made explicit that a lender is not allowed to simultaneously take on the role of guarantor.[105] This was a major step in legitimizing the shadow-banking system as it now deemed legal one of its key characteristics and by extension did the same for the FinTech services, but also allowed the government to set up clear restrictions.

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[101] Takeshi Jingu, *China set to step up regulation of internet finance from 2016* (Nomura Research Institute, 2016) p. 1

[102] Departamentos CCA Ontier, 'Fintech Regulation in China – Where are we going at the world's biggest market for mobile banking and paying services' *CCA Ontier* (23 June 2016) <http://ontier.i-am.pt/2016/06/23/fintech-regulation-in-China-where-are-we-going-at-the-worlds-biggest-market-for-mobile-banking-and-paying-services/> accessed 24 March 2017

[103] Ibid

[104] Brad Herrold, 'GC Agenda China: August 2015' (2015) Practical Law China Articles 0-618-3687 p. 9

[105] Chen and Wu, 'China' p. 3

In July of 2015 the *Guideline on the Promotion of the Healthy Development of Internet Finance* was issued. This guideline has the aim of increasing the development of FinTech services such as the taking over of traditional financial services and platforms that bring together demand and supply of FinTech. They have been put in place largely to promote the FinTech sector and to reform the financial sector. Innovation is highly encouraged on FinTech platforms to stimulate the vitality of the market. This can be done by supporting internet companies to create payment solutions and lending- and crowdfunding platforms. On the other hand, e-commerce companies are encouraged to improve their financial services and to bring them in compliance with existing regulation. The financing industry should create an inclusive environment in which different parties can receive the funding they need, especially paying attention to small loans to SMEs and individuals. The guidelines also encourage the movement of banks and non-banks working together in order to complement each other's businesses.[106]

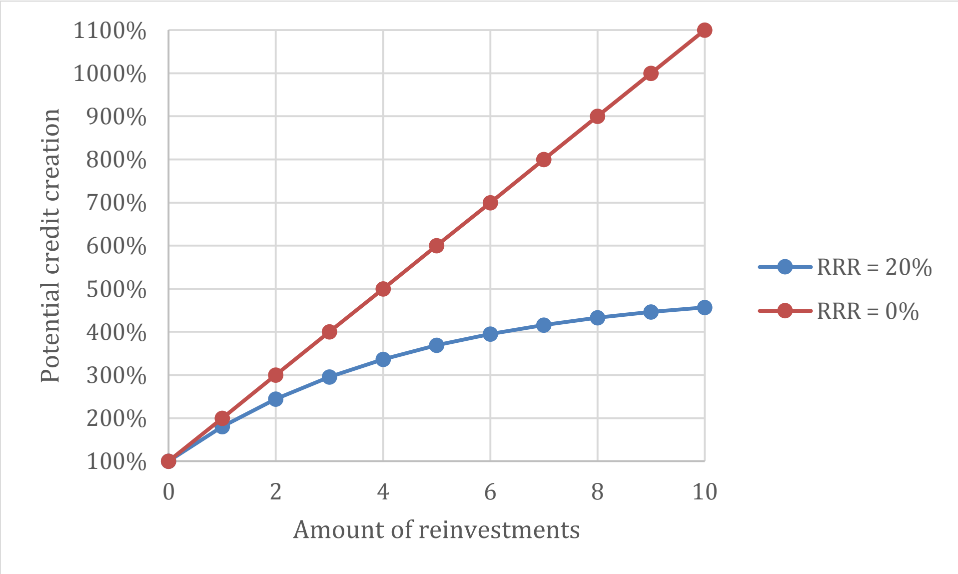
Regulatory oversight was also overhauled through these guidelines, which preserved the following division of responsibilities: (1) the PBoC is in charge of internet payment services, (2) the CBRC Commission concerning the regulation of banking will regulate lending services, trusts that function solely online, and financing of Chinese consumers. (3) The Chinese securities regulatory commission will take account of the investment fund management and the crowd funding or P2P platforms. They will also regulate the sale of financial products online. Further, the government has given various tasks to the Ministry of Industry and Information Technology, the telecommunication departments, and the State Council Internet Information Office.[107] These Guiding principles are a joint effort by these and other financial institutions, and are the first regulations focussed specifically on the FinTech industry and its implications for the financial industry at large.[108] The Guideline covers rules that entail mandatory compliance on different subjects such as online financial settlements, loans, insurances and P2P or crowd funding platforms.[109] This compliance entail mandatory disclosure of the company's business model, financial data, cash flows etc. Also mandatory safety measures to protect consumer data are required.[110]

Also regulation concerning the lending of money is in place for the traditional bank operated *Wealth Management Products* ('WMPs')[111]. These WMPs are offered to customers as an alternative to a deposit, but with a higher yield. This regulation states that the banks must hold a certain percentage of the money they receive and lend out again for the purpose of being able to pay back the original investor in cases of default, the so called reserve requirement ration ('RRR'). This rule, keeping the RRR at 20%, a very high level compared internationally, should bring more financial stability in the market and aims to keep Chinese banks healthy. At the same time, it does not apply to the companies in the shadow banking industry, FinTech and to shadow loans of the traditional banks, often held through intermediaries. This widens the gap between the regulated state-owned bank loans and the under-regulated shadow banking loans. The potential future consequences of this divide could be considerable, as this system of uncapped lending and reinvesting (and lending, reinvesting, etc.)

[106] Jun Wan, *China Issues the Long-Awaited Guidelines on Internet Finance* (Internet Finance Law - Han Kun Law Offices, 2015) p. 1
[107] Departamentos CCA Ontier, 'Fintech Regulation in China – Where are we going at the world's biggest market for mobile banking and paying services'
[108] Anna Gamvros, Stella Cramer and Barbara Li, 'FinTech regulation in China, Hong Kong, and Singapore' (2016) <http://www.nortonrosefulbright.com/knowledge/publications/139380/fintech-regulation-in-China-hong-kong-and-singapore> accessed 1 June 2017
[109] Ibid
[110] Wan, *China Issues the Long-Awaited Guidelines on Internet Finance* p. 3
[111] Emily Perry and Florian Weltewitz, 'Wealth Management Products in China' (2015) June Quarter 2015 Reserve Bank of Australia Bulletin p. 59

leads towards fast paced credit creation where the RRR is 0%[112] (see Graph 1). The low RRR leads to on the one hand creation of credit in order to satisfy a large demand, but on the other side brings a lot of risk when parties default on their loans. As the financial system of shadow banking is (by definition) opaque, it is hard to say whether the official and unofficial types of lending are being combined, or whether they remain two distinct fields and will not affect each other when the economy would go down and credit cannot be repaid. However, banks are lending out an increasing amount while the deposits remain quite stable. This could indicate that banks do use the 0% RRR option in order to meet the lending demand.[113] In 2015, the strict regulation concerning this loan-to-deposit ratio has been temporarily removed to help the some struggling banks, but this rule has helped the shadow banking activities rise to power in China.

Graph 1: Potential creadit creation after 10 reinvestments



Source: Guilford, 'Five charts to explain China's shadow banking system, and how it could make a slowdown even uglier'

III.1. Peer-2-Peer lending

The July 2015 *'Guideline on the Promotion of the Healthy Development of Internet Finance'* has been updated in December of 2015 through further guiding opinions covered in a consultation draft regulation that concerns P2P platforms specifically, which progressed into the *Interim Measures on Administration of the Business Activities of P2P Lending Information Intermediaries* that were published at 24 August 2016 ('2016 Interim Measures') by the CBRC, the MIIT and China's Cyber Administration. These regulations were published after some P2P platforms were unmasked as being elaborate schemes in order to deprive elderly Chinese citizens of

[112] Gwynn Guilford, 'Five charts to explain China's shadow banking system, and how it could make a slowdown even uglier' *Quartz Extra Credit* (20 March 2017) <https://qz.com/175590/five-charts-to-explain-chinas-shadow-banking-system-and-how-it-could-make-a-slowdown-even-uglier/>

[113] Lending boom in 2005-2006: Richard C. K. Burdekin and Pierre L. Siklos, 'What has driven Chinese monetary policy since 1990? Investigating the People's bank's policy rule' (2008) 27 Journal of International Money and Finance 847 p. 849-850For 2009-2013:Guilford, 'Five charts to explain China's shadow banking system, and how it could make a slowdown even uglier'. The current situation: Jun Luo and Helen Sun, 'Another Financial Warning Sign Is Flashing in China' *Bloomberg*, (2016) <https://www.bloomberg.com/news/articles/2016-11-15/another-china-red-flag-rises-with-loans-on-track-to-top-deposits> accessed 2 March 2017

their pension savings by using the invested funds for their own means[114], leading to losses and unrest in the Chinese general public, many of them lenders on such platforms. Also, the government is trying to mitigate the housing crisis in the bigger Chinese cities by ensuring people need to provide considerable equity instead of loaning everything. Even though this is undercut by many P2P platforms who lend out money regardless[115], this regulation is seen as a 'welcome regulatory development'[116] that aims to protect the consumer who participates on such platforms and also tries to ensure viable growth for P2P platforms.

Obligations for all companies that wish to set up a platform entail that they must notify the appropriate administrations that supervise these activities, no minimum caps are put up in terms of either size, revenues, etc. For the sake of transparency, platforms should apply for a so-called Internet Content Provider ('ICP') license with the MIIT. This license allows a company to host a website in mainland China.[117] Further, they should perform background checks on their customers, also assessing their creditworthiness and assess how genuine the information provided actually is. On top of this, a record should be kept from every transaction that has taken place and the associated communication logs from the parties for at least 5 years. All of this information needs to be securely stored and protected, and be processed in mainland China. It is forbidden to send the data overseas in order to process it, which might seriously hinder foreign players on the market but also Chinese companies who want to outsource the analysis of their data. Other regulation such as Anti-Money Laundering and measures to avoid the financing of terrorism further diminish the freedom these companies have. A lot of the information obtained they therefore have to share with the relevant authorities.[118] While these measures might have been implemented to ensure the safety of consumer and their data, one of the consequences is that it limits the competition on the market largely to solely Chinese companies.

In December 2015 the PBoC introduced further regulation, this time focussing on *non-bank providers of online payment services*. These non-banks need to be licensed with a permit as issued by the PBoC before they can provide their services. Further, they must comply with Know-Your-Customer ('KYC') guidelines that require the companies to have ensured the identity of customers through a customer identification system. There are also several industries from which the companies are banned, including 'securities, insurance, financing, trust, wealth management, [and] currency exchange or withdrawal services'[119] Specific disallowed activities are (in the insurance market) issuing guarantees of repayment for the members lending money by backing the borrowers (in the asset-backed-securities market) transferring debt, as well as performing activities that would expand their online existence in the offline world. Other barred activities include the creation of asset pools or storing funds of consumers and advertising P2P business activities through other than online means. Most of this regulation is in place to ensure that these platforms keep to their role of intermediary for information between lenders and borrowers, and not to engage in the activities now performed by banks. This does curtail competition on the financial markets. Figure 5 shows the oversight structure for these P2P platforms.

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[114] Xie Yu and Jennifer Li, 'China imposes cap on peer-to-peer loans to rein in runaway 'shadow banking' scams' *Sout China Morning Post* (24 August 2016) <http://www.scmp.com/business/banking-finance/article/2008552/china-imposes-cap-peer-peer-loans-rein-runaway-shadow> accessed 24 March 2017

[115] Don Weinland and Yuan Yang, 'China to crack down on P2P lenders' *Financial Times* (Hong Kong 14 March 2016) <https://www.ft.com/content/2cd149d0-e999-11e5-bb79-2303682345c8> accessed 14 April 2017

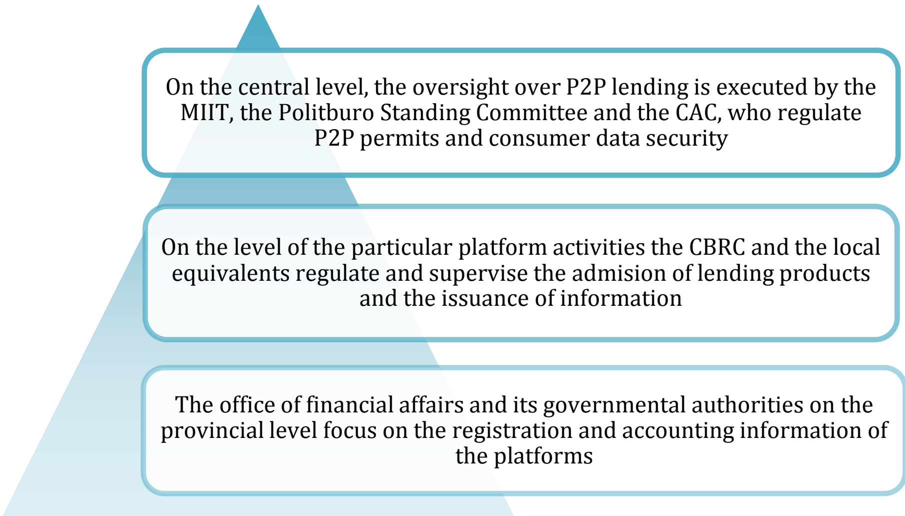
[116] Richard Gu and others, *P2P lending in China enters into a regulated era* (Linklaters, 2016) p. 1

[117] Cao Yin, 'Real names required for phone apps' *The Supreme People's Court of the People's Republic of China* (29 June 2016) <http://english.court.gov.cn/2016-06/29/content_25901207.htm> accessed 24 June 2017

[118] Gu and others, *P2P lending in China enters into a regulated era* p. 2-4

[119] Gamvros, Cramer and Li, 'FinTech regulation in China, Hong Kong, and Singapore'

Figure 5: Oversight structure of P2P platforms



Source: Richard Gu and others, P2P lending in China enters into a regulated era (Linklaters, 2016)

The *Business Guidelines for P2P Fund Custodians* published by the China Banking Regulatory Commission ('CBRC') set the stark requirements that, next to full disclosure, platforms need to have a custodian bank backing them up. These custodian banks hold securities of customers for safekeeping with the aim of decreasing risk; to ensure that chances of criminal behaviour or major losses through bankruptcies of the platforms will be avoided.[120] The platforms need those custodian banks in order to be allowed to perform their services. While some platforms have complied with the guidelines of finding a custodian bank, many have not. In January 2017 state media indicated that only 183 of more than 2,400 platforms in China (around 7.6%) have made such an agreement.[121] At the end of March 2017, this does not seem to have accelerated.[122] Hesitation in getting custodian banks comes from two sides, with platforms getting an extra regulatory burden when it comes to transparency and less influence over the funds they obtain, and banks being unsure about the potential risks such platforms bring to their activities and their balance sheet.

The *2016 Interim Measures* also set caps on the loan size that these platforms can issue towards their customers. For consumers, the cap is currently set to ¥ 200,000 on a single platform and ¥ 1 million across platforms, while companies can loan a maximum of ¥ 1 million and ¥ 5 million, respectively. The likely aim for these measures is to ensure that P2P lending is kept to a small scale, only concerning small amounts of money and aimed at the Chinese citizens instead of large companies with larger financial needs. At the moment, general oversight over all outstanding debts is lacking, leaving it almost impossible to see whether these caps are enforced over multiple platforms. However, these caps apply retroactively, forcing the platforms to recall the funds exceeding these caps and change the business models to only attract the appropriate borrowers. Nonetheless, when the demand for these larger amounts remains high, it is quite probable that these platforms will not change their business model to only cater to smaller loans, but will find a way around the current legislation in order to also provide that part of the market and receive the profits this extra business brings with it.

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[120] Maggie Zhang, 'China's 'Big Four' banks still keeping a safe distance from burgeoning peer-to-peer lending sector' *South China Morning Post* (14 December 2016) <http://www.scmp.com/business/companies/article/2054472/Chinas-big-four-banks-still-keeping-safe-distance-burgeoning-peer> accessed 24 March 2017

[121] Don Weinland, 'China P2P lenders braced for regulatory crackdown' *Financial Times* (9 January 2017) <https://www.ft.com/content/41e706f4-d631-11e6-944b-e7eb37a6aa8e> accessed 14 April 2017

[122] Jonathan Nieh, 'Chinese P2P Lenders Are Still Having Trouble Finding Bank Custodians' *Crowdfund Insider* (29 March 2017) <https://www.crowdfundinsider.com/2017/03/97901-chinese-p2p-lenders-still-trouble-finding-bank-custodians/> accessed 24 May 2017

III.2. Payment settlement ('clearing') challenges for FinTechs

King, an economics professor and deputy governor of the Bank of England, already stated 18 years ago that 'There is no reason, in principle, why final settlements could not be carried out by the private sector without the need for clearing through a central bank'[123]. He further points out that at even though at the time of writing this might not have been feasible as 'practical implementation of such a system would require much greater computing power than is at present available'[124], there are no 'conceptual obstacles' that would prevent this activity. King mentioned this in a speech in 1999. Even though others criticised King and argued that alternative settlement mechanisms would not come to fruition[125], in the time since King's speech the amount of computing power has risen with such a degree that this should not lead to any major capacity issues, thereby removing the main bottleneck in King's argumentation.

The current financial market provided a solution for clearing payments used in large parts of the world that has become the market-standard is the Continuous Linked Settlement ('CLS') system. While the CLS currently covers 18 currencies, the Chinese Renminbi is not one of them.[126] Even though the PBoC has become shareholder in CLS[127], it will be some time before the currency will be part of the CLS[128]. The future will show whether China is willing to allow the Renminbi to join in the services of CLS, or CLS will open an Asian branch to give China more control.[129] Chances of that happening do however seem small, as the Chinese state has planned the introduction of a state directed ('PBoC') clearing house where FinTech transactions will be cleared. At the moment this is a task that the third-party payment services have done themselves. When this clearing house will be established, the state will be responsible for clearing all of the transactions, thereby minimizing the settlement risk (the risk that A does pay but B does not deliver). The shareholders of this clearing house will be the third-party payment providers. Though in the distribution of shares there still remain some problems. Even though many want to avoid having shareholders with a major influence in the company, other distributions than on market share might give small companies a major advantage in pursuing their own incentives. When there would be a distribution according to market share, again the two big players (Alibaba and Tencent) will be able to dictate the rules.

Further, the Chinese government is planning on taking away the main source of revenue from the small payment service providers, namely the interest on money when it is in the hands of these companies when transitioning from one party to the other. Even though the timeframe in which the money is held is quite short, the large amounts will for most providers ensure their main stream of income. The reasoning behind the measures is that this can potentially lead to illegitimate incentives for these companies, as they are inclined to keep the money on their account as long as possible. Further, because companies often spread the money over a large number of accounts, the financial streams remain opaque to others, thereby enabling these companies to hide illegal money streams such as money laundering. Therefore, the plan is announced to prohibit this activity and force

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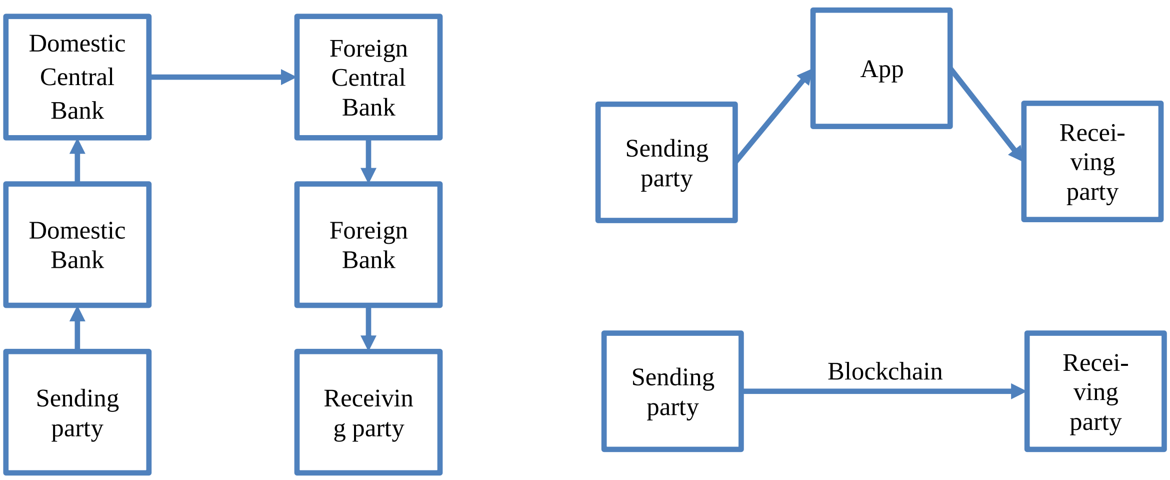
[123] Mervyn KingBank of England, *Deputi Governor - Challenges for Monetary Policy: New and Old (Speech)* (Symposium on "New Challenges for Monetary Policy", 1999) p. 26
[124] Ibid
[125] Freedman, 'Monetary Policy Implementation: Past, Present and Future – Will Electronic Money Lead to the Eventual Demise of Central Banking?' (2000) 3 International Finance 211 p. 221
[126] CLS Group, 'Currencies' (2017) <https://www.cls-group.com/About/Pages/Currencies.aspx> accessed 24 May 2017
[127] CLS Group, 'Bank of China becomes CLS shareholder' *Finextra* (<https://www.finextra.com/pressarticle/11661/bank-of-china-becomes-cls-shareholder> for a full list of shareholders see CLS Group, 'Shareholders' (2017) <https://www.cls-group.com/About/Pages/Shareholders.aspx> accessed 24 May 2017
[128] Patrick Graham, 'Exclusive: Adding China to FX settlement system will take years - CLS' *Reuters* (London <http://www.reuters.com/article/us-China-forex-cls-idUSKCN0XV1DK> accessed 24 May 2017
[129] Galen Stops, 'As RMB Internationalises, Questions Arise Around Settlement' *Profit & Loss Magazine via R5* (<http://r5fx.co.uk/uncategorized/as-rmb-internationalises-questions-arise-around-settlement/> accessed 24 May 2017

these companies to put the money on a specifically assigned account that gives no interest. This will align the incentives of the consumer more with the banks as both of them are now helped by a transaction that happens as fast as possible.

However, will this help the consumer in the long run? The fees that these third-party payment companies charge is very low with 0,1% for withdrawing over ￥20,000 being charged from October 2016 onwards (before that no charges were added at all)[130], especially compared with an equivalent company such as PayPal, who charges currently 3.4% and an additional fee of €0.35 per transaction for business sales.[131] In order to charge these low amounts for the services provided, revenue streams need to come from other sources. When the Chinese government will regulate this income stream and in time will reduce it to 0%, many providers will either need to raise their prices or go bankrupt. Especially the small providers, who cannot differentiate and invest like the big players on the market can, will feel the negative consequences that these new policy changes will bring. Furthermore, the barriers to entering this market will be heightened, both for domestic as well as foreign potential participants. As these new players do not have the means to diversify and often need to have an immediate income stream in order to grow, deterrence is placed on entering the market.

This leads to a further disadvantage for the consumer, namely the strengthening of the market position for the big players in the market, Alibaba and Tencent. As their position will get more and more oligopolistic, they will be able to increase the prices for the services provided. These disadvantaged should be weighed against the added protection that these measures give the consumer. Protections here comprise the shielding against companies that invest the money of the transaction in to high-risk high-profit projects, thereby endangering their ability to complete the transaction afterwards.

Figure 6: Traditional international settlement, a FinTech settlement Blockchain settlement



All of this is still a short-term solution, as the structure difference in figure 6 shows that a settling a payment will be something of the past. Through decentralised settlement the need for one central party to form the authority over such a payment as well as to check its validity and ensure its completion, will entirely vanish. This will bring a lot of benefit to the consumer, as they will not be dependent anymore on one single party. Eventually, also the lock-in effect of certain apps can be eliminated by creating an open standard for sending and receiving payments that works independently of the programme in use by either party.

[130] Zhang Shuai, 'Alipay to start charging fees for cash withdrawal services' *China Radio International China* (11 October 2016) <http://english.cri.cn/12394/2016/10/11/3821s942330.htm> accessed 31 May 2017
[131] PayPal, 'Fees' (2017) <https://www.paypal.com/nl/webapps/mpp/paypal-fees> accessed 24 May 2017

III.3. KIIO

More recently, the Cyberspace Administration of China has issued a *Draft rules on the national security review of online products and services used by PRC information systems*.[132] This 4 February 2017 consultation draft upon which the new *Cyber Security Law* (due to go into force at 1 June 2017) is based[133] designates the financial sector as one of the 'key industries' which must go through thorough inspection for the benefit of national security. This Cybersecurity law (art. 35[134]) designates 'important Internet application systems'[135] also as a key information infrastructure operators ('KIIO'). This designation means that the Chinese government would like to also categorize apps like WeChat and TaoBao under the notion of KIIO. As these apps and many other online services whose purpose entails (also) financial services process personal information of millions of Chinese consumers every day, these consumers might be seriously harmed in case of a data breach or a leak. Most, if not all, of the FinTechs shall therefore fall under this new regulation.

A national framework is put in place to ensure all designated online products and services are under constant supervision of the CAC, where no distinct circumstances under which these reviews are allowed or disallowed to take place are mentioned. The products and services under review will be inspected upon their 'security and controllability' where the risk of hacking, leaking of personal information, and the loss through unfair competition will be given extra attention. The draft is not concrete on the amount of information that the companies need to share with the government, leading to uncertainty both with domestic and foreign FinTechs. Other uncertainties are the amount and the manners of inspection of the various governmental entities, and the ways in which FinTechs might be hindered in performing their services. Regulation in this new law concerning the prohibition of sending data abroad might have far-fetching problems not only for foreign FinTechs but for domestic alike, especially when it comes to blockchain technology. This technique (further explained in chapter V) requires that data is being shared among many computers in order to guarantee safety. The location of these computers is often irrelevant and can be all around the world. It is therefore nearly impossible to guarantee that such data will stay within the country. This could potentially hinder the development of blockchain and similar technology in the financial sector, leaving the consumer out of all of the advantages it can bring.

Many domestic and international companies who will (or would when starting activities in China) fall under the category of a KIIO are uncertain of what these developments will mean for their business. Authorities are reassuring that the new framework will not hinder product entering the Chinese market and will only boost the markets as it will restore and increase confidence of the Chinese citizens in the online products and services. Further, there will be no distinction between services provided from within China and from abroad.[136] However, as the rules still need to be supplemented with additional details, none of the assurances work very well for

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[132] Fang Jian, Richard Gu and Annabella Fu, *China publishes draft rules on enhanced security review of online products and services* (Linklaters Cyber Security Review Rules, 2017) p. 1

[133] Kirstin McCracken, Sarina Keung and Sam Chen, 'Getting prepared for the new Cybersecurity Law' *Eversheds Sutherland (International) LLP* (China 12 April 2017) <http://www.eversheds-sutherland.com/global/en/what/articles/index.page?ArticleID=en/global/Hong-Kong/Getting-prepared-for-the-new-Cybersecurity-Law> accessed 24 May 2017

[134] Clarice Yue and others, 'China Cyber Security Law Update (2) – Will Network Products and Network Services Pass the Test?' *Bird&Bird* (Hong Kong 15 February 2017) <https://www.twobirds.com/news/articles/2017/china/china-cyber-security-law-update-will-network-products-and-network-services-pass-the-test> accessed 24 May 2017

[135] Scott Thiel, Carolyn Bigg and Paula Cao, 'China Data Protection Update (January 2017)' *DLA Piper Publications* (Hong Kong 27 January 2017) <https://www.dlapiper.com/en/australia/insights/publications/2017/01/china-data-protection-update/> accessed 24 May 2017

[136] Xinhua, 'China to introduce review commission on cyber security' *China Daily* (Beijing 8 February 2017) <http://www.chinadaily.com.cn/business/tech/2017-02/08/content_28135358.htm> accessed 24 May 2017

businesses. For FinTechs multiple problems will surface when they would fall under this regulation. Even though transparency can only be encouraged, checks with vague delineated objectives, duration and frequency can seriously burden the companies in their day-to-day activities. Further, the competitive advantage that these companies have will immediately be clear to the government, whereby their service can efficiently be blocked or copied for governmental gain and destruction of threats. Lastly, next to protecting citizens from companies, FinTechs and other companies could decide that they have a duty to afford protection vice versa. Through this regulation, shielding citizens from governmental interference in their personal information stored by the company will become impossible. This can become a problem when companies want to guarantee their user's privacy. This draft regulation is part of a larger strategy of the Chinese government concerning cybersecurity: the aim is to guarantee 'cyberspace sovereignty and national security'.[137]

Table 1: a schematic overview of the effect of FinTech regulations on consumer protection

Name of regulation/guideline	**Effect consumers**			**Comment**
	Bad	Average	Good	
Measures and Guidelines on electronic banking	X			Brought a lot of regulatory uncertainty. Succeeded in 2015.
Administrative Measures for Payment Services by Non-Financial Institutions	X			No clear FinTech regulation, patchwork. Succeeded in 2015.
Judicial interpretation legitimizing non-bank lending		X	X	This legitimizes shadow banking and the whole FinTech industry, gave opportunities for regulation of shadow banking. Did enable (too) strict regulations.
Guideline on the Promotion of the Healthy Development of Internet Finance		X	X	First regulation to address FinTech specifically.
Wealth Management Product Regulation		X		Keeps banks safer with providing a buffer against a potential crisis, but FinTech activities are not protected.
Interim Measures on Administration of the Business Activities of P2P Lending Information Intermediaries		X		Protects consumers, but also hampers (international) competition in the market.
Gives banks mandatory caps on interest for deposits and floors for loan interest		X		Made banking expensive for consumers, but helped FinTech flourish.
PBoC regulation on non-bank providers of online payment services.	X	X		Includes KYC regulation, protecting from fraud but hindering ease of use.
Business Guidelines for P2P Fund Custodians	X			Ties FinTechs with banks, hindering innovation that could be achieved without banks slowing FinTech down
Mandatory clearing through UnionPay	X			Puts a burden on FinTech, increases state control and burden on market entry. Consumers lack ease of use and have bear extra costs that companies make.
Draft rules on the national security review of online products and services used by PRC information systems	X			Overregulates and puts up thresholds for new companies.

[137] http://www.Chinadaily.com.cn/business/tech/2017-02/08/content_28135358.htm

Overall aim to guarantee 'cyberspace sovereignty and national security'		X		Protects consumers but only leads to benefits when done correctly
Guidelines for Promoting the Development of the Wholly Privately Owned Banks		X		Makes the banking services of FinTechs more legitimate, but entails that FinTechs need to adhere to strict banking rules

All of this is making for a more level playing field, but I would argue not on the level that is best for the consumer. By restricting FinTechs it is indeed fairer to established banks in terms of competition, but it would be much better for them to feel the need to innovate, which is now largely reduced. Even though innovation does occur, it is reasonable to assume this would go much faster when the FinTechs would be able to extend their place ahead in the race even further. Therefore, I do think that the current regulation reaches its goal of consumer protection, but that there are (un)intended consequences that stifle the market.

So where does this regulation leave us in answering the question whether the current regulation will be adequate to lead to consumer benefits on the FinTech market? The rationale for regulating the FinTech industry seems clear; under- or light regulation did help the industry grow at a very fast pace, but also left room for abuse of the system and criminal activities. The regulation discussed shows that the Chinese government performs a balancing act between protecting the consumer and giving FinTechs leeway to grow. Consumer protection is often performed through one particular method: governmental interference in businesses to ensure that the commercial incentives align with those of the state. Apart from the regulation that has a clear protectionist aim such as the mandatory state settlement regime, even rules that have the aim of helping the industry will only be effective from a short-term perspective. It will not so much help to prevent the next scandal in FinTech. The regulation is created after the fact and therefore will only make it more difficult to prevent crimes that adhere to the same method as the previous ones did. People abusing the new technologies will find a way around current regulation in order to enrich themselves illegitimately. This reactionary stance will therefore not be able to keep up with the fast changing technological environment and the chances this brings for criminality and fraud.

Regulation has not really reduced the pace of development in the FinTech sector, but is putting up large barriers to entry for new start-ups with innovative ideas.[138] The costs of compliance to all regulation and the restrictions on new industries to cover can lead to stifling competition. The large incumbent players are therefore helped by this strict regulation to ensure their powerful position even more. This can lead to an oligopolistic system where only large companies will be able to operate, therefore harming the competitive forces that are beneficial to the general population. Further, the FinTech industry's unique selling point is the ease of use of the services. Governmental regulation is currently hindering this trend, be it for legitimate reasons. Consumer protection is something really important and should be pursued by the state, but as this directly goes against one of the primary reasons an emerging industry exists, the FinTech businesses will find ways to circumvent the regulation and still give their customers the quality of services they have grown used to.

To conclude, one can see that while the aims of the current legislation seem for the majority well-intended, the execution of it will in the end hurt consumers more than it will help them. When we turn to our question: 'is the financial market adequately regulated to bring consumer benefit in the financial services industry?' we can say that it is not. While the aim of protecting consumers is somewhat achieved but leaves room for circumvention,

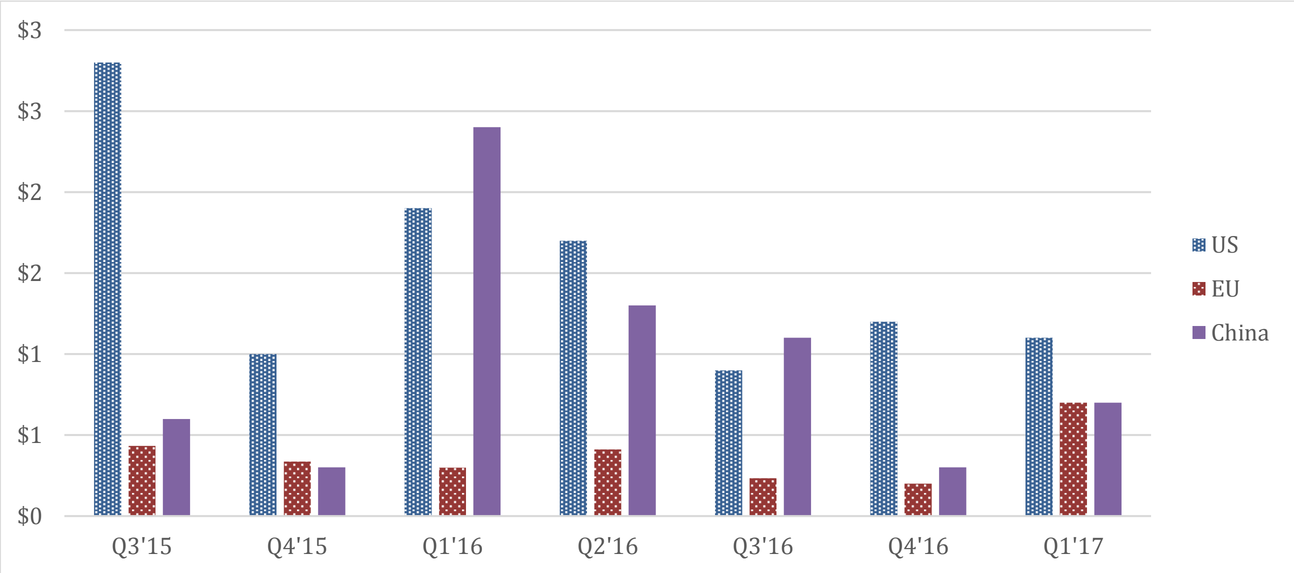
[138] David Porteous, 'The "golden age" of digital finance in China' *Digital Frontiers Institute* (Boston 9 February 2017) <https://digitalfrontiersinstitute.org/switch/component/easyblog/entry/2017/02/the-golden-age-of-digital-finance-in-China?Itemid=thought-leadership> accessed 24 May 2017; comparing 64 countries (US, China, Many EU-member states, etc.) on FinTech efforts Christian Haddad and Lars Hornuf, 'The Emergence of the Global Fintech Market: Economic and Technological Determinants' (2016) No. 6131 CESifo Working Paper Series p. 21; covering developed countries and developing countries in Asia and Africa Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?'

innovation on the financial market is stifled and new entrants have less options to disrupt the market and provide the customer the best experience in order to gain market share. Pro-active regulation can provide solutions here.

IV. A COMPARISON BETWEEN THE ASIAN, US AND EU FINTECH MARKET

The banking systems of China on the one hand and the US and Europe on the other have already been compared on a plethora of different variables,[139] but what is of interest in this thesis is the difference in VC investment in the FinTechs. VC investment is taken as an indicator for future growth in the market as it both gives a good indication of the quality and growth potential of start-up companies and economic growth of these start-ups after investment. The start-ups that grow and show profitability are more likely to attract VC funding, from which one can conclude that the lack of such funding will indicates companies with less opportunity for growth. Further, VC investment provides a signalling role for other resource holders[140], indicating that the VC has vetted the firms and examined where they invest in as having growth potential. Lastly, the fact that VC investors are closely paying attention to the market they invest in (as opposed to more passive investors), they are the first to see when it is less viable to invest. A decrease of VC investment, while other investment might not decrease that much yet, therefore is a good indicator of future growth stagnation in the market. A shift away from certain markets might indicate that many of the start-ups did not get through the vetting and therefore were not of the potential growth likeliness that the VCs wanted who then invested somewhere else. VC investment is therefore a good indication in the (potential) growth and overall quality of the market.

Graph 2: VC Investment in the FinTech industry per quarter in billions



Sources: Fortnum, Mead, Pollari, Hughes and Speier, *KPMG The Pulse of Fintech Q3 2016* (Global analysis of investment in fintech, 2016) and Fortnum, Pollari, Mead, Hughes and Speier, *KPMG The Pulse of Fintech Q1 2017* (Global analysis of investment in fintech, 2017)

Even though global FinTech investments have increased rapidly in the last years (a surge from 1.8 billion to 19 billion dollars in the 2010-2015 period[141]) reports identify diverging trends among the US, EU and China; three

[139] An example based regulatory structure and to enhance future growth: Huang, 'Institutional Structure of Financial Regulation in China: Lessons from the Global Financial Crisis'

[140] Antonio Davila, George Foster and Mahendra Gupta, 'Venture capital financing and the growth of startup firms' (2003) 18 Journal of Business Venturing 689 p. 706

[141] Ronit Ghose and others, *Digital Disruption* (Citigroup Global Perspectives & Solutions Report Series, 2016) p. 15

major markets in FinTech development.[142] Citigroup observed in March 2016 that 'Chinese dragons roared and some previously feted Western FinTech leaders wilted'.[143] In 2017, the outlook seems a bit different. While the US could make up for the decline of investment mid-2016, 2017 does not yet look very positive and investment is not nearly back to the heights that it has been before. The Chinese market also suffered from a decline after a successful Q1 2016, but increased in VC investment in 2016 by 104% when compared to 2015.[144] In contrast to the US China is seeing major increase in Q1 2017. The European market is getting a sudden surge in investment putting the number on par with that of China, but has majorly lagged behind in the past, with a decline in investment year-over-year of 27% when looking at 2015-2016[145] (see Graph 2). How can these differences be explained? To answer this question this thesis looks at different factors. Geographical characteristics can lead to opportunities for FinTechs, e.g. the smartphone penetration is high in both China and Europe[146] while the access to local banking is low in China[147]. As well, the manner of growth of the FinTech market and can give investors a (lack of) confidence to invest in start-ups. Further, the regulatory viewpoint taken by regulators is of major concern, as this can help or hinder FinTechs. In addition to the thorough overview of Chinese regulation in Chapter III this chapter elaborates on the markets and regulations of the EU and US FinTech ecosystems, after a discussion of the differences found between developing and developed markets in general.

IV.1. Developed v. developing countries

When discussing differences in economic growth between developing and developed countries, often arguments for growth are found in the foundational and strict institutions in developed countries. These would provide for strict regulation and would lead to less uncertainty. However, Allen and others find that in countries where the legal and financial instruments are underdeveloped (as is often the case in developing countries), growth can still be attained. The source of this growth is often the 'informal' sector consisting of privately owned companies that also includes the shadow banking activities, as opposed to the 'formal' sector that covers SOEs and public companies.[148] In the research, they conclude that the informal sector can make use of other mechanisms for governance based on implicit obligations derived from contracts and the reputation of all players. This is a worthy substitute for the governance instruments in the formal sector, and in other developed countries for that matter. Therefore, economic growth has had a vastly different path of growth in developing countries such as China when compared to developed countries with strong legal and financial institutions such as countries that have a system based on English common law.

FinTech has had a different timeline in developed and developing countries. In developed countries, the digitization of financial services started in the 1960s with the invention of the ATM machine.[149] The markets became more globalized when systems such as SWIFT could provide ease of use for cross-border payments. These systems can already be labelled as FinTech, even though this label had not been defined yet. This also sparked the beginning of RegTech (which will be elaborated on in chapter V), as cross-border banks needed to craft contracts with their foreign equivalents in order to reduce the riskiness of these payments. Banks first

[142] The major researcher reports all focus on these areas for FinTech: Dennis Fortnum and others, *KPMG The Pulse of Fintech Q3 2016* (Global analysis of investment in fintech, 2016) p. 3; Fortnum and others, *KPMG The Pulse of Fintech Q4 2016*; CB Insights, *The Global Fintech report Q1 '17*
[143] Ghose and others, *Digital Disruption - Revisited* p. 7
[144] Ibid p. 7
[145] Ibid p. 7
[146] Ibid p. 13
[147] Ibid p. 19
[148] Allen, Qian and Qian, 'Law, Finance, and Economic Growth in China' p. 4
[149] Douglas W. Arner, Janos N. Barberis and Ross P. Buckley, 'FinTech, RegTech and the Reconceptualization of Financial Regulation' (2016) Forthcoming Northwestern Journal of International Law & Business p. 10

concentrated on the digitization of their internal processes, after which they standardized services in order to be able to outsource services. After this, the focus came on consumers who demanded technological advancement.[150] The regulators were much stricter in developed countries, thereby eliminating a regulatory grey zone in which FinTechs thrive.[151]

In developing countries such as China, the adoption rate of mobile applications for payment and banking is much higher than in developed countries. The European average adoption rate for mobile banking services is 38%, while developing countries see adoption rates of 60%-70%.[152] This has a vast effect on the course that FinTech will take in the different nations. In developed countries it is often the innovation of banks that leads customers to use the mobile banking applications and other FinTech products. These banks were initially service oriented in the use of the technology instead of sales oriented, which meant that only for a very limited amount of activities (such as only checking current balance) customers could use their apps, while still being dependent on non-mobile activities for other products such as loans and payment. Banks are afraid that the sales messages through the app will agitate the customer and that the rapid addition of services will bring risk of error and the unwanted invasion of 'device intimacy' between the customer and their mobile phone.[153] This approach is vastly different and much more conservative than in many developing countries, where a plethora of services are offered and this 'device intimacy' seems to play a much more insignificant role.

In contrast with, and even thanks to, the gradual development of FinTech in developed markets, developing markets can make quick leaps forward. Building on existing technologies but also skipping many of the minor steps that other countries needed to take, developing countries are catching up and even surpassing developing countries when it comes to technological innovation. India is a good example where through governmental action aiming to have a FinTech sector as open and unhindered as possible, the FinTech industry is growing rapidly with many successful product able to change the market. One of the major players is Paytm with a user base over 100 million, providing a payment environment for the many unbanked citizens in India.[154] In Kenya, M-Pesa performs similar activities, but this company is launched by the big telecom operators instead of from a start-up structure. This lead to its large popularity as it was available widely from the start of the FinTech wave in 2007.[155]

IV.2. Europe

The European Union has been eager to acknowledge the effect FinTech can have on the integrated EU market: 'digitalisation should in principle foster cross-border activity'[156]. The EU predicts that further FinTech development will help to bring down national barriers and offer the EU citizen a wider choice of services. Their actions aim to ensure that companies can interact with the customers irrespective of location within the EU. FinTechs are drastically affected by current EU regulations, which can both advance and restrict their activities. Even though no specific FinTech regulation exists, different directives are focussed on the FinTech industry,

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[150] Puschmann, 'Fintech' p. 71
[151] Markus Gnirck, 'What's the Difference Between Asian and European FinTech?' *fintechnews.sg,* (2016) <http://fintechnews.sg/2017/fintech/difference-between-asian-fintech-vs-european-fintech/> accessed 24 May 2017
[152] David Hodgkinson, *KPMG Mobile Banking 2015* (KPMG 2015) p. 11
[153] Ibid, p. 14
[154] Neha Punater and Vidhya Shankar, *Fintech in India* (KPMG, 2016) p. 12
[155] Kieron Monks and Anastasia Beltyukova, 'M-Pesa: Kenya's mobile money success story turns 10' *CNN Africa* (Africa 24 February 2017) <http://edition.cnn.com/2017/02/21/africa/mpesa-10th-anniversary/> accessed 24 May 2017
[156] European Commission, *Green paper on retail financial services Better products, more choice, and greater opportunities for consumers and businesses (COM/2015/0630 final)*, 2015) p. 11, section 2.2

leading to FinTechs needing to comply with a 'Broad palate of rules and regulations'[157]. Notable are the (1) e-Money directive ('EMD'), (2) the Payment Services Directive ('PSD' and 'PSD2') and (3) the Anti Money Laundering Directive ('AMLD'), of which the specifics on digital identification can be found in (4) the Regulation on Electronic Identification and trust services ('eIDAS'). This regulation helps citizens, companies and public authorities within the EU to verify their identity and create more trust in cross-border transactions.

EMD forbids all FinTechs that receive money from customers to redistribute or store (e.g. through a mobile wallet) to operate without a license obtained from the Financial Supervisory Authority in the member state. This requirement, while upholding quality control, will increase the barriers to entry on the FinTech market and can therefore be detrimental to FinTech success in the EU. PSD aims through standardization to ensure that payment within the EU is on the same level as national payments when it concerns ease of use, protection, and costs. It further wants to open up the payments market to new players, providing opportunities for FinTechs and other tech companies. Similar to other regulations the PSD2 also focusses on security, requiring financial entities to secure payments with 'Secure Customer Authentication'.[158] It also requires financial institutions to allow third parties access to their database upon permission of the consumer whose data it concerns through an open API. The AMLD also adds to verification regulation, with the focus of combating fraud by obliging companies to know who their clients are. This often creates 'media discontinuity' where the online process a FinTech provides is interrupted for an offline and physical check of identity.[159] The eIDAS provides a toolkit to be used by the member states where different KYC techniques can be chosen.[160] This approach leads to EU members having vastly diverging standards concerning customer identification. Sometimes the customer needs to be physically present at a location to ensure the identity, while for others only checking official identity card through sending a picture is enough. This adds drastically to compliance costs of companies wanting to cater the entire EU market. However, improvements can be seen whereby both FinTechs and banks alike use advanced techniques such as biometric identification in order to ensure a customer's identity.[161]

Even though the second Payment Services Directive goes a long way in allowing non-banks in the field of financial services in Europe, it seems that the European Union is hesitant in allowing non-banks to have access to the clearing and settlement mechanisms. To increase the understanding of the impact of FinTech on the financial industry, the EU has set up a public consultation.[162] The objectives are: to see whether the regulation currently in place is adequate to support new developments; increase access to financial services; increase efficiency and reducing costs; lowering barriers to entry to the EU single market; and find a balance between data sharing and citizen privacy.[163] Experts, though, argue that consultation is not going far enough and there should be a two-way conversation between the EU and the FinTech innovators in order to enable adequate regulation, and where necessary exceptions in enforcement of current rules. The call for input on RegTech problems and solutions of the Financial Conduct Authority ('FCA') is mentioned as an example of such an inclusive discussion[164], further discussed in Chapter IV.4.

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[157] Louis Jonker, 'Invading the Financial Ecosystem with Technological Innovations: Navigating the EU Legal Framework' (ITechLaw European Conference, Amsterdam) p.12

[158] Steve Cook, 'Feature - Selfie banking: is it a reality?' (2017) 2017 Biometric Technology Today 9 p. 10

[159] Financial Market Authority Lichtenstein, *Overview – FinTech regulation*, 2016) p. 2

[160] Andrea Servida, *eIDAS & 4th Anti-Money Laundering Directive - a short update* European Commission Futurium (23 August 2016) <https://ec.europa.eu/futurium/en/content/eidas-and-proposal-amendment-4th-anti-money-laundering-directive> accessed

[161] Cook, 'Feature - Selfie banking: is it a reality?' p. 10

[162] European Commission, *Consumer Financial Services Action Plan MEMO/17/670* (European Commission 2017)

[163] Ibid

[164] Pēteris Zilgalvis, 'The Need for an Innovation Principle in Regulatory Impact Assessment: The Case of Finance and Innovation in Europe' (2014) 6 Policy & Internet 377 p. 384-387

An example of FinTech implementation initiatives comes from the Netherlands, where the Van Lanschot bank decided to outsource its entire payment system to a FinTech company.[165] The option for outsourcing to FinTech was the preferred alternative to closing down its entire payment system, because the bank's customers indicated that they saw value in having a payment account at Van Lanschot.[166] Fidor, the FinTech of choice, will process all of the payment traffic and provide the customers with a digital-first experience, giving the customers more influence and oversight over their payments.

The Van Lanschot example shows that traditional banks in Europe do see the need to change their banking activities in order to stay relevant. A first step is made by Van Lanschot, however this is quite dissimilar from the Chinese partnerships. Those partnerships have the aim of both parties to grow and reach customers they otherwise would not have reached that often had no access to banking services at all, instead of cost saving because of less service that needs to be provided (one of the reasons for the Van Lanschot partnership is 'saving costs by being able to power down [a] mainframe'). Van Lanschot is outsourcing a small branch of its activities which will allow them to focus on their main task of giving investment advice to the more affluent customer. This also imposes a risk to Van Lanschot because as they keep concentrating on their traditional core competences without inviting IT solutions there, soon Van Lanschot will also face competition from FinTechs. I argue that merely outsourcing one branch for the sake of cost reduction is not the right direction to go, but merely a short-term solution to ever growing costs and to satisfy the current customer needs without looking too far to the future. An action like this can even be seen as window dressing, where is seems that the bank is doing something in FinTech and tries to get a reputation as a technologically advanced bank, while in reality just spinning off some activities while remaining in the same traditional state of mind. An internalization of FinTech still lacks, leading to negative consequences for the bank in the future.

A much more integrated example is the Dutch Bunq bank, a FinTech company with a Dutch banking license. This company is currently opening up its IT software in order for third parties to have access to the information, already complying with the future implementation of the PSD2 regulation. Bunq takes a much more integrated approach where FinTech is playing a leading role in every aspect of banking activity. The Dutch government, though, is criticised for its strict regulation for FinTechs, as different FinTech start-ups claim that the Dutch National Bank is unaware of the innovations in the financial system and that the regulations for obtaining a banking license are much too costly and burdensome thereby hindering innovation.[167]

So why has investment lagged behind in Europe the last years? Long-term differences are coming from the lack of a major VC market in the EU, so companies need to find other sources of funding. Also, the technology giants that are prevalent in the US and China are lacking in the EU. Further, the recently growing unrest by the members regarding the structure of the EU increases uncertainty, leading risk avoidant investors to withholding their spending. Even though the eventual actions might not hinder investment so much (e.g. VC investment has not slowed down after Brexit[168]), the uncertainty that these potentially destabilizing events bring with them before actually happening can do serious harm.[169] In the long term, the switch away from the EU by some

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[165] Maarten van Poll and Rutger Betlem, 'Van Lanschot besteedt betalingsverkeer uit' *Het Financieele Dagblad* (9 March 2017) Ondernemen

[166] Ibid

[167] Rutger Betlem, 'Toezichthouder stevig aangepakt in debat over financiële innovati' *Het Financieele Dagblad* (Amsterdam 22 January 2016) Economie en Politiek

[168] Dennis Fortnum and others, *KPMG The Pulse of Fintech Q1 2017* (Global analysis of investment in fintech, 2017) p. 47

[169] Kadhim Shubber, 'Brexit trouble for British venture capital' *FT Alphaville* (10 May 2017) <https://ftalphaville.ft.com/2017/05/10/2188575/brexit-trouble-for-british-venture-capital/>; Peter S. Goodman, 'Turbulence and Uncertainty for the Market After 'Brexit'' *The New York Times* (New York 23 June 2016) <https://www.nytimes.com/2016/06/25/business/international/brexit-financial-economic-impact-leave.html?_r=1>

member states could have a major influence on regulation and opportunities of cross-border growth as the playing field is less levelled. Furthermore, the stance that the regulator takes concerning FinTech also influences the growth of VC investment. A more reactive approach is taken in many (but certainly not all) European countries, which leads to a slowdown in VC investment.[170] Through a reactive approach, the regulator invites a lot of regulatory uncertainty without many safe harbour guidelines under which the FinTechs can operate. This leads to a very unstable and uncertain environment, hindering investment from risk averse investors.

The sudden growth in Q1 2017 ending the VC 'drought'[171] can be related to the FinTech market reaching a more mature phase in Europe where investors have confidence in investing in proven business models. The investments are seen as more safe and able to provide a safe harbour for when potential further uncertainty unfolds in the EU through the changing political climate in some member states. As the deadline for mandatory implementation of PSD2 is coming closer, more investment will be done in FinTechs that facilitate this compliance. Q1 2017 has shown the start of this increased investment.

IV.3. United States

The United States seems to show a decline in 2017, in contrast to China and Europe. The regulatory system of governments and state autonomy and the uncertainty and confusion this brings, seem to be a major contributing factor. The system for awarding licenses to companies providing bank like services has shown a great variety on the state level. On the federal level many regulations are in place for the purpose of consumer protection, anti-money laundering and bank supervision that also have an effect on FinTechs. Consumer protection is enforced by multiple public authorities that all have their own responsibilities towards US citizens and have varying degrees of positivity towards FinTechs. The main authorities for regulating FinTech are the following. First, the Consumer Financial Protection Bureau ('CFPB') announced Project Catalyst in October 2012 to enhance consumer friendly innovation in general, but with a focus on digital companies.[172] The CFPB comments that they do not believe that FinTechs do and should receive any other treatment than other more traditional companies. Both banks and non-banks need to be held to the same standards when it comes to compliance and oversight.[173] Second, the Federal Trade Commission uses their authority under the *1914 FTC act*[174] in order to bring judicial action against companies that disadvantage their clients[175] and aims to be the leading regulator concerning data protection and privacy concerns by focusing on new FinTech technologies.[176] And third, the Department of Justice investigates companies that have misled their customers or other criminal activity, e.g. in the internal reporting failures of Lending Club, a US-based P2P lending platform.[177]

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[170] Vermeulen, *What is the Best Regulatory Response to Fintech?*
[171] CB Insights, *The Global Fintech report Q1 '17* p. 20
[172] Richard Cordray, *Project Catalyst report: Promoting consumerfriendly innovation* (Consumer FInancial Protection Bureau, 2016) p. 15
[173] Richard Cordray, 'Prepared Remarks of CFPB Director Richard Cordray at Money 20/20' (2016) <https://www.consumerfinance.gov/about-us/newsroom/prepared-remarks-cfpb-director-richard-cordray-money-2020/> accessed 23 October 2016
[174] 1914 Federal Trade Commission Act, 15 USC §§ 41-58, as amended (2006)
[175] Federal Trade Commission, 'Protecting Consumers on the Cutting Edge of Financial Transactions' *Federal Trade Commission,* (2017) <https://www.ftc.gov/news-events/media-resources/consumer-finance/financial-technology> accessed 24 May 2017
[176] Kari S. Larsen and Michael Selig, 'Federal Trade Commission Considers the Implications of AI and Blockchain Technologies' *ReedSmith Client Alerts* (15 March 2017) <https://www.reedsmith.com/en/perspectives/2017/03/federal-trade-commission-considers-the-implication>
[177] Richard Waters, 'Lending Club given grand jury subpoena' *Financial Times* (San Francisco 17 May 2016) <https://www.ft.com/content/4732ce90-1bc9-11e6-b286-cddde55ca122>

Concerning money laundering, FinTechs must abide to regulation that is applicable to all financial institutions, as they qualify as a money service businesses.[178] The case of the Financial Crimes Enforcement Network ('FinCEN') against Ripple Labs[179], a payments settlement and clearing platform, shows that FinTechs must comply with the existing regulation of federal Anti-Money Laundering even though this regulation was enacted far before any of the FinTech innovations were envisioned, or pay the price for non-compliance (in this case a $700,000 fine).

Even though state level regulators have major influence over the operations of FinTechs, a centralization initiative is being put in place by the Office of Comptroller of the Currency ('OCC') (A US Treasury Department agency), which proposes a 'special purpose national bank charter'[180] that becomes available to FinTechs. The regulator remarked that regulation stemming from the previous century will need a major overhaul to remain relevant presently.[181] The envisioned national bank can potentially relieve some of the compliance problems and costs that FinTechs are facing. However, this initiative will not remove all of the influence that states have, as they will still be responsible for granting licenses and enforcing compliance with state regulation in the meantime. As well, the Department of Financial Services announced that the federalization of these state activities will strongly be opposed and that the states are in the best position to regulate FinTechs.[182] The idea has also received criticism regarding the OCC overstepping their authority and lack of consistency of regulation across the financial industry.[183] It seems that FinTech friendly initiatives are being actively pushed back by incumbent forces.

The option of VC funding has been popular in the US for a long time, and contributes to the large amounts of VC funding in FinTechs nowadays as this is a popular way of receiving finance for a growing company. VC companies rely heavily on their reputation in order to receive the required funds to invest[184], which is amplified by the close proximity that VC companies have in US locations where VC funding is prevalent such as Silicon Valley. Yet, as funding gets more digitised (e.g. through blockchain, see chapter V) this kind of reputations matters less. Further, the abovementioned stringent regulations cannot help the regulatory uncertainty that also plays a role in the US. The presidential election has had a major influence on the regulatory path which the US is taking[185], so many investors are holding off large deals in order to see what the effect would be after the autumn election. Further, the aforementioned scandal with lending club has made investors weary of investing in new FinTechs, because they now see that the lack of investor knowledge can lead to large scandals and a considerable decline in company value when the US authorities strike down on a company, in the extremes even causing bankruptcy.

It lately shows that the US has taken the perspective comparative to many European countries when it comes to FinTech; a reactive and more specifically a fragmented approach.[186] This is evidenced by the lack of a well-

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[178] John Graetz and others, *The evolving Fintech regulatory environment: Preparing for the inevitable* (Deloitte Center for Regulatory Strategies, 2017) p. 2

[179] 2015-05 *In the Matter of Ripple Labs Inc. and XRP II, LLC*, (Financial Crimes Enforcement Network) p. 2-4

[180] Office of the Comptroller of the CurrencyOffice of the Comptroller of the Currency, *Exploring Special Purpose National Bank Charters for Fintech Companies*, 2016) p. 3

[181] Thomas J. Curry, *Remarks by Thomas J. Curry Comptroller of the Currency Before the Institute of International Bankers* (Comptroller of the Currency Speeches, 2015) p. 5

[182] Graetz and others, *The evolving Fintech regulatory environment: Preparing for the inevitable* p. 2

[183] Tara Jeffries, 'OCC Chief Pushes Back on Criticisms of Fintech Charter Plan' *Morning Consult* (6 March 2017) <https://morningconsult.com/2017/03/06/occ-chief-pushes-back-criticisms-fintech-charter-plan/> accessed 25 May 2017

[184]Douglas Cumming, *Venture Capital: Investment Strategies, Structures, and Policies* (Robert W Kolb series in Finance, John WIley & Sons 2010) p. 376

[185] Fortnum and others, *KPMG The Pulse of Fintech Q4 2016* p. 45

[186] Vermeulen, *What is the Best Regulatory Response to Fintech?*

considered plan for regulating and stimulating FinTech in the US. The innovation is being met with positive and negative reactions of various degrees by different authorities and in politics, but no all-embracing effort to either welcome or deny FinTech has been taken. While the welcoming approach would be better than an unwelcome one, the uncertain situation that is currently created is even more damaging, as many potentially positive opportunities are not dared to be taken.

IV.4. Regulatory Sandboxes: the way (back) to growth?

Many developed countries have taken measures to allow FinTechs, more specifically often start-ups, as much leeway as possible in order to carry out their FinTech solutions and to see how these solutions would work in the 'real world' through so-called regulatory sandboxes. These can be found in the United States, Australia, Singapore, the United Kingdom, and other countries. For the EU and US there is also some positive development that may change their behaviour from reactive to more pro-active, potentially leading the way towards growth again. Both in the US and in the EU the notion of a regulatory sandbox is a topic of discussion. In the EU the call for such a sandbox becomes stronger, with the European Banking Federation ('EBF') urging the European Union to establish a similar model to the US and the UK.[187]

Sandbox initiatives have been sprouting up in many places around the globe. The concept encompasses legislation that will give companies with certain ideas the space to develop and test their products or services without having to adhere to certain traditional regulations that prohibit these developments. This cluster of rules and exceptions will give companies the opportunity to test in a live environment so they can see how the real-world implications of their idea unfold. As the exceptions or additional legal requirements are closely monitored, consumers do not run the risk of being unprotected when using this new product or service. For companies, the benefits are clear; they minimize the difference between ideas in theory and real life implementation. This will ensure that their products are better received and will lead to less risk of implementation.

The UK's FCA is one of the frontrunners mitigating risk for start-ups and gathering info for regulatory change.[188] This governmental organisation is creating an attractive environment for FinTechs through their innovation hub and the regulatory sandbox. It has already successfully two cohorts of companies, with the deadline for the second closing in January 2017.[189] The main aim of the FCA is to reduce the time-to-market for many innovations in the financial industry. The sandbox participants range from start-up companies launching their first idea, to financial giants aiming to be at the front of the pack. Another example is the Monetary Authority of Singapore that set up a sandbox in November 2016. Their approach differs from the FCA as they do not accept companies in cohorts ('akin to a FinTech "accelerator" programme'[190]) but amending law on a case-to-case basis depending on the needs of a company.

How do the other markets compare in adequately regulating the financial system in order to bring consumer benefit? We see that while FinTech growth in the US has been persistent for a long time, the regulation is giving off a fragmented signal introducing a lot of uncertainty for all players in the market. This hurts consumers as innovation comes to a halt and thereby competition in the market is reduced. In the EU this fragmented and

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[187] Financial Conduct Authority, 'Financial Conduct Authority unveils successful sandbox firms on the second anniversary of Project Innovate' (2016) <https://www.fca.org.uk/news/press-releases/financial-conduct-authority-unveils-successful-sandbox-firms-second-anniversary> accessed 25 May 2017

[188] Mark Fenwick, Wulf A. Kaal and Erik P.M. Vermeulen, 'Regulation Tomorrow: What Happens When Technology is Faster than the Law?' (2016) 2016 TILEC Discussion Paper 24 p. 25

[189] Authority, 'Financial Conduct Authority unveils successful sandbox firms on the second anniversary of Project Innovate'

[190] Linklaters, *Singapore's "regulatory sandbox" – new consultation*, 2016) p. 2

reactive approach has been prevalent for quite some time, but it seems that the pro-active approach that the EU regulator takes and different EU level entities try to encourage, looks very promising for the future. When we look at the Chinese market for comparison, one can argue that the regulatory perspective the government takes is somewhat more geared towards FinTech than in the US, but the all-encompassing regulations and guidelines also lead to uncertainty as it is not really clear whether FinTechs will or will not fall under certain regulation. Though not taken into consideration in aforementioned research, this behaviour will likely be categorised as reactive. Regardless, the FinTech industry is still growing, as is VC investment. This can come as a surprise but '[Even though] regulation matters, […] we have to realize that there are other components that make up an attractive ecosystem for Fintech.'[191]

V. REGTECH: A SOLUTION TO FINTECH PROBLEMS?

As discussed above, the fit between the Chinese regulator and the rise of FinTechs is far from ideal. Regulators claim that FinTechs are obliged to 'follow the existing rules'[192], while they are not aligned with the objective to protect consumers and enhance innovation. It would be much more efficient for both sides to ensure that regulations are transparent, up-to-date, and tailored for changing circumstances. This makes it less burdensome for FinTechs to follow regulations, and therefore ensures a higher compliance rate. One of the options for creating this perfect – or at least better fitting – regulation is to use the same technologically induced methods that have made the FinTech industry so successful, and to learn from the mistakes that this industry has made on their path to growth.

V.1.Definition of RegTech

The use of technology in the field of regulation is often called to according to the same nomenclature as its financial peer: RegTech. RegTech is often defined as a subset of FinTech but with a focus on increasing efficiency of regulatory compliance compared to the current capabilities[193]. However, I agree with the dissenting opinion that RegTech is 'more than just an efficiency tool'[194] because it does not just focus on compliance and does not just focus solely on banks. Its scope is much broader, covering different fields such as governmental and FinTech actions, and activities such as creating new legislation. This chapter proposes different initiatives for the use of RegTech that could help the Chinese government strike a balance between a hands-off and a too strict regulatory approach. It makes a distinction between short-term and long-term initiatives. The short-term initiatives can, even though being disruptive, lead to fast solutions and aim to continue the head start that China has in the FinTech wave. Long-term initiatives take a longer timeframe and look at how the idea of finance will change and how the government can play a role in this.

RegTech has the aim to make most use of technological advancements in creating and amending regulation for the regulator, and enforcing compliance of all players. Arner and others define two distinct market sectors where RegTech is in use at the moment and will be able to create rapid development. (1) The financial markets[195], where financial institutions are using the techniques to keep up with regulatory compliance demands that come

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[191] Vermeulen, *What is the Best Regulatory Response to Fintech?*

[192] Tim Culpan and Nisha Gopalan, 'China's Fintech Party Crasher' *Bloomberg* (27 June 2016) <https://www.bloomberg.com/gadfly/articles/2016-06-28/drink-up-quick-alibaba-the-pboc-wants-your-punch-bowl> accessed 25 May 2017

[193]Financial Conduct AuthorityFinancial Conduct Authority, *Call for input on supporting the development and adopters of RegTech* (Feedback Statement, 2016) p. 3

[194]Arner, Barberis and Buckley, 'FinTech, RegTech and the Reconceptualization of Financial Regulation', p. 14

[195] Ibid, p. 18

from the government. This has become all the more important with the increasing regulatory burdens after the 2008 financial crisis consisting of among others, KYC and Anti Money Laundering rules. Next to this advantage, financial companies also use RegTech in their own main sources of income and risk mitigation through using big data analysis to better select and review customers taking on products that entail some degree of risk.[196] (2) Regulators[197]: the regulatory system has, even with a lot of experience, often largely consisted of trial and error. As an increasing amount of information becomes available to the regulator, this can be used for automated oversight of industries, protecting the customers of FinTech products, and create legislation that provisionally can reduce risk instead of only penalizing after-the-fact.

V.2. RegTech for Banks and FinTechs

The aftermath of the economic crisis brought with it increased regulation on the banking sector all over the world. Even though China has been relatively isolated from its effects[198], it still was exposed to the negative effects as other trading partners were hit harder and decreased trading. Regulatory response of the Chinese government was needed to mitigate the economic downturn it faced. Different measures were taken in different fields, such as minimal financial reserves regulation, caps on exchange rates, etc.[199] In addition to this, the government has been coming back from its path towards trade liberation on the financial market, and has taken the stance of more regulation and more stringent requirements on the financial sector, mostly in protection of incumbent SOEs. These extra regulations bring with it extra costs, for the financial industry, regulators, as well as for FinTechs.

The Chinese financial services companies have increased costs as they need to adhere to capital requirements (e.g. through the *Regulation Governing Capital of Commercial Banks* (in which *Basel III* was implemented) as promulgated by the CBRC in 2012), operations (e.g. human capital as compliance becomes more and more burdensome), and penalties (for non-compliance).[200] Through this additional cost the extra regulation has put on the sector, the call for RegTech became louder. Especially real-time compliance could bring a major advantage to these companies.

RegTech can mitigate the abovementioned problems. Examples of this can be found around the globe, for example the British FCA conducted a call-for-input in whereby companies could provide feedback regarding their views of RegTech, its implications, the future, etc. Three categories of functions emerged that were all focussed on short-term RegTech evolution. The largest category where RegTech could be of use is in forecasting and prediction of likely scenarios.

Models can be created to predict what the consequences – both intended and unintended – are of different measures. This function did receive some criticism, as some argue that historic information is by definition not suitable for the prediction of the future, and that RegTech will not be able to extract future info from a database when only past data is available.[201] However, this view seems not to be shared widely and the majority of experts

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[196] Kristen Silverberg and others, *RegTech in Financial Services: Technology Solutions for Compliance and Reporting* (Institute of International Finance, 2016) p. 17
[197] Arner, Barberis and Buckley, 'FinTech, RegTech and the Reconceptualization of Financial Regulation', p. 32
[198] Huang, 'Institutional Structure of Financial Regulation in China: Lessons from the Global Financial Crisis' p. 228
[199] John Whalley and others, *China and the Financial Crisis* (The Centre for International Governance Innovation/Chinese Academy of Social Sciences Task Force, 2009) p. 8-10
[200] Arner, Barberis and Buckley, 'The Evolution of Fintech: A New Post-Crisis Paradigm?' p. 40
[201] Larry D. Wall, 'Prudential Regulation, Big Data, and Machine Learning' *Federal Reserve Bank of Atlanta - Center for Financial Innovation and Stability* (November 2016) <https://www.frbatlanta.org/cenfis/publications/notesfromthevault/11-prudential-regulation-bigdata-and-machine-learning-2016-11-21> accessed 26 May 2017

and news agencies are of the opinion that this modelling can be used to (to a certain degree) predict likely future scenarios.

A second function is that of risk data aggregation, which makes used of large databases containing financial information of companies or customers, including the capital and liquidity. This can then be used in internal assessment systems that can analyse the risk a certain investment will bring or a change in the risk of existing investments. Information can also be send to regulators, so through this system less discrepancy will persist between the regulations and the knowledge of the companies about these regulations. On a template basis all data can then be delivered, giving the government what they want and keeping the companies free of fines for not supplying the correct information. A system like this will also reduce or even diminish the need for a large legal department whose job it is only to take care of compliance with regulation. Through these innovations, smaller companies can enter a market that was previously inaccessible through the large legal costs.[202]

Customer identity is the third big function of RegTech and will start playing a larger role as the enforcement in China of KYC rules will get stricter. The better this technology becomes, less and less physical contact is needed between the customer and the client. This gives practical benefits, such as ease of use of the service for the consumer, no media-discontinuity and a much more sped up process for administrative actions that would usually require face-to-face contact between the parties. An example is a customer opening a bank account without the need to go to an office of a brick-and-mortar bank.

V.3. RegTech for Regulators

It has become quite clear from the above that RegTech is a movement that cannot easily be stopped and neither should be stopped in order to give consumers the freedom of spending and lending they want while still protecting them, and giving companies a competitive advantage but also making sure they keep the consumers in mind. 'The RegTech train has left the station and is building up momentum.'[203] Therefore many experts show ways in which the state can accommodate the RegTech initiatives to make sure that they can come to fruition on the commercial market.[204] This chapter takes a different angle by investigation whether the Chinese government should not merely accommodate RegTech initiatives but itself can use RegTech in order to create the ideal regulatory field for technology companies, especially in the financial sector. The main idea in current academia is that the burden for compliance only lies with the commercial institutions, and that the regulator should try its best to encourage these activities. What often happens in these situations is that the regulators step in quite early with stringent regulation in order to stifle all innovation in a certain field, or the regulator is paralysed and does nothing to ensure protection of what needs to be protected.[205]

This thesis proposes that the government now has the means to ensure their own RegTech based measures on regulating the financial sector, and therefore does not solely have to depend on technology companies developing technical solutions to regulation. The Chinese government should take an active role in this and also make use of technology to create regulation that will in the end benefit the consumers most. This will require

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[202] Martin Arnold, 'Market grows for 'regtech', or AI for regulation' *Financial Times* (14 October 2016) <https://www.ft.com/content/fd80ac50-7383-11e6-bf48-b372cdb1043a> accessed 26 May 2017

[203] Jason Boud, 'Welcome to RegTech: the age of disrupting the status quo is here' *Finextra* (4 February 2017) <https://www.finextra.com/blogposting/13641/welcome-to-regtech-the-age-of-disrupting-the-status-quo-is-here> accessed 26 May 2017

[204] Using RegTech for better reports that banks can create concerning compliance: Kevin Petrasic, Benjamin Saul and Helen Lee, *Regtech rising: automating regulation for financial institutions* (White & Case Publications, 2016) p. 3; Using RegTech so businesses can better save governmental documents: Kari S. Larsen and Shariq Gilani, 'RegTech is the New Black – The Growth of RegTech Demand and Investment' (2017) 54 The Capco Institute Journal of Financial Transformation 22 p. 26

[205] Fenwick, Kaal and Vermeulen, 'Regulation Tomorrow: What Happens When Technology is Faster than the Law?' p. 16

that the government take a more proactive position instead of the oft-treaded path of providing reactive solutions to imminent problems. In what follows some examples will be discussed in which the Chinese government can take this proactive position, proving that this is what is expected from good regulation currently and what is needed to be able to specialize in the governance of tomorrow. The options are selected because of their applicability to the Chinese regulatory system in terms of state-, financial-, and political structure, among others. Other countries with less regulatory oversight or a more 'flat' public system might choose other options to implement RegTech, e.g. projects to create demand for technological solutions in different industries for countries with a low penetration of tech companies, and on the other extreme RegTech options to replace the entire government.

V.4. Short term solutions

These solutions mentioned hereunder are able to give solutions for the regulator to engage in RegTech in the short term. They should be regarded as quick fixes: effective in the short run but not as drastic as the long-term solutions mentioned thereunder.

V.4.1. Sandbox

Vermeulen and others introduce three principles that create a foundation for this new form of regulation in which the regulator makes use of alternative law making methods in order to have a proactive policy instead of being reactive. Their first principle concerns data driven regulatory intervention where regulators depend on data to know 'what, when and, to a certain extent, how to regulate'[206]. It can be implemented by various public bodies, e.g. by making use of the data coming from company activities in the market, from consumers, and other sources that can better inform the regulator about the consequences of created policy.

The second principle of Vermeulen and others covers one of the solutions that can contribute to a more pro-active regulatory regime: a principle-based approach to regulation, in which the government will leave policy more open ended and less detailed. It also leaves room to change regulation after-the-fact, to be flexible to changing circumstances. It seems that the Chinese government is stepping away from this approach, and is implementing stricter regulation to be able to mould the innovative FinTechs into precise regulatory regimes, often still based on a variety of the regulation for the traditional banking system. The new guidelines can potentially lead towards very strict requirements to which innovative companies need to adhere in the financial sector, but the details of the regime still remain unclear. The authors point out that companies can be critical of this approach because principle based approach would lead to uncertainty in doing business as details of laws can be unclear through the possibility of amendments after their implementation. Already in China there are problems with the proposed guideline that do not include enough detail regarding who exactly the law applies to, what certain terms will entail and how this regulation could be changed afterwards. The criticism of such an approach is thus likely to be widely shared in China when this principle would be implemented into the system. Criticism can be mitigated when FinTechs have close contact with the regulator. Then principles can be explained further and applied accurately, giving a clearer view of how to abide to the law and what to expect of future legislation concerning their individual case.

To mitigate principles-based problems, the aforementioned regulatory sandbox is introduced as a last principle. Next to the clear benefits that such a sandbox gives the companies, the information coming from these experiments form a goldmine of real world data upon which decision making of the government can be based. As the regulator sees that many innovative products are held back through the same legal burden, the regulator may be inclined to change the law in favour of these companies. This is also where the benefits of the

[206] Ibid p. 15

government come in. As the new innovative FinTechs operate in a more or less controlled environment, a lot of information can be extracted from this. It can show how products operate for actual consumers and what unintended legal risks and opportunities this gives. A considerable amount of companies is willing to join such a programme, thereby providing a lot of data from different angles for the state. This can be used to form models in which regulation can be tested that defines the balance between business success and consumer protection in a very precise way. This will be especially effective in China as the guidelines often invite a lot of opaqueness concerning scope and other details. A case-by-case analysis would provide the certainty companies need to progress.

A sandbox initiative like this does bring with it a flipside when it would be implemented in a state-centred system such as China. The amount of data FinTechs produce in this system also provides the government with a better and up-to-date understanding of the new technologies. As mentioned before, this could help to make regulation which will help innovation, but the same info can be used to stifle it. Protectionist views will aim to find ways to ensure that the status quo of the traditional banks having large influences, will stay intact. This will be easier to accomplish when the government is one of the first to know about a technology and immediately can find the most rigorous means to hinder it. However, this view will likely decrease the success of a regulatory sandbox, as companies will then conclude that the benefits of such programme do not outweigh the disadvantageous situation it will put them in later. This could lead to the same path that most FinTechs have used currently in China, profiting from unregulated fields and becoming too-big-to-fail in such a short timespan that the government does not have the opportunity to implement protectionist measures. Also, the sandboxes can be used to include only certain companies with the required leeway to innovate, while excluding other that still need to abide by strict regulation. This could incentivise a monopolistic environment in the FinTech industry populated with companies that are willing to operate by the rules of the government and under close supervision. Therefore, a regulatory sandbox can only exist and provide the data the government needs for more effective law-making when the interests are aligned with the participating companies.

The chance of adaptation of this solution is quite feasible, as it only requires minimal changes in the regulatory system and will also benefit the regulator. My prediction is that China will follow the innovation minded countries around the world as well as in Asia and implement this in the near future.

V.4.2. Consumer Feedback

A second manner in which the Chinese government can use RegTech in order to benefit their citizens is by gathering and analysing large amounts of data that have been provided by the population itself about company conduct. Before actually fining and otherwise penalizing companies, first actual misconduct of companies needs to be detected. This could come from a detailed analysis of the company's administration, but this manner of crime detection might not always be so effective. Here the citizens of a country play a crucial role. As they are interacting with the companies as consumer quite often, their feedback should be heard, not only to detect crime but also to ensure that public bodies can discourage conduct that is technically lawful but does entail consumers being harmed. When this information is dispersed, it is nearly impossible to find patterns and reoccurrences in the feedback of consumers. Therefore the state could act as a hub in which all of this data is centralized in order to get the most comprehensive overview of the service quality that companies deliver. This is an example of the data driven approach discussed earlier which will be helpful in reducing the gap between consumer and regulator, a problem that is big in China because of the power distance between the two and a power imbalance between citizens and the government. Digitised consumer feedback solutions will provide an anonymous outlet so the consumer can freely complain which enables the regulator to know what is important for its citizens.

An example of this use of big data analysis can be found at the American Consumer Financial Protection Bureau. This public body is gathering data on user complaints in different categories, ranging from housing mortgages to payday loans and student credit. The organisation has put a lot of effort in the method of setting up their database and anonymizing the data to enable other consumer advocacy organisations or journalists to use APIs to extract the relevant data to stay up-to-date of major changes in the particular field they serve.[207] This form of data gathering breaks with the methods of traditional information gathering on which new regulation is based. The regulators do not receive data about company performance from companies, but directly from the company's consumers. This extends the amount of information a regulator possesses to create policy, ensuring that more parties benefit from newly enforced or amended rules.

V.4.3. Incubators

In order to bridge the gap between established companies and start-ups, corporate-founded incubators can play a major role.[208] These incubators offer start-ups resources and knowledge to enhance growth. In China, incubators have historically been founded by the government as part of a state strategy to continue growth of the economy in the transition phase towards a market economy in the 1990s.[209] Even though the aim is to make incubators (both governmentally owned and with mixed ownership) financially viable, China still subsidizes both incubators and incubatees heavily, partly due to the barriers to financing for these SMEs.[210] State owned incubators have disadvantages: they do not help the start-up become independent (companies refuse to exit incubation) and focus on land and infrastructure investments[211], even though the latter does not positively correlate with SME performance.[212] Further, the advantages that these government-owned incubators have (better access to governmental contacts and access to capital[213]), are increasingly taken over by FinTech initiatives. The access to governmental services is less needed because FinTechs take over this task. Further, the increased access to capital makes for less reliance on the state.

Even though incubators are often seen as helping innovation and creating disruption, China has taken a reactive approach in incubating companies that will likely neither bring new FinTech or RegTech innovation nor does disrupt the incumbent banks. The method in which these incubators are used should therefore change drastically. The ownership of these incubators is currently in the hands of the government, which as history has shown value company growth of incubatees but does not foster innovative ideas. Therefore it will be best if more voices have a say in the incubators, thereby ensuring that outside interests are also represented and not only the profitability of the government through leaving state-owned banks in charge is taken into account. The government owned incubators can make room for incubators that are for the majority or even wholly corporate owned. FinTechs and RegTechs can play a major role here: they will be able to share the latest technological solutions with start-ups in order to comply with regulation and make them skyrocket. The information that

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[207] David Porteous, 'What is regtech and why does it matter?' (2016) <https://www.youtube.com/watch?v=YOzPC8yFs1U&feature=youtu.be> accessed 26 May 2017

[208] Erik P.M. Vermeulen, *How To Prepare for Automation? Or, Why We Need More "Artificial Intelligence Ecosystems" Now!* Hackernoon (5 APril 2017) <https://hackernoon.com/how-to-prepare-for-automation-or-why-we-need-more-artificial-intelligence-ecosystems-now-4a4a767e733b> accessed 26 May 2017

[209] Aruna Chandra, Wei He and Tim Fealey, 'Business Incubators in China: A Financial Services Perspective' (2007) 13 Asia Pacific Business Review 79 p. 79

[210] Ibid p.81

[211] Yunhao Zhu, 'Inter-Incubator Relationships and New Venture Perfomance in China's Technology Business Incubators between 2008 and 2012' in Phillip H Phan, Sarfraz A Mian and Wadid Lamine (eds), *Technology Entrepreneurship and Business Incubation: Theory, Practice, Lessons Learned* (Imperial College Press 2016) p. 92

[212] Jin Hong and Jinfeng Lu, 'Assessing the effectiveness of business incubators in fostering SMEs: evidence from China' (2016) 20 Int J Entrepreneurship and Innovation Management p. 57

[213] Ibid p. 57

governments and private owners receive from start-ups can now be used by both entities in order to cater to their own and incubatee growth, and to enable an attractive regulatory environment.

Legitimacy concerns could surface as legitimisation methods currently run by the government would lose their authority when civilian run incubators emerge. There is a list of 'National Technology Business Incubators' approved by the Ministry of Science and Technology which would become less important. However, as part of FinTech, technology based quality assessment is becoming more prevalent. Here incubators, incubatees, and all other parties involved can assess each other's quality (the 'eBay assessment structure'). This ensures that all parties will be safe in working with each other and also unknown parties, whereby the governmental oversight of quality assessment is no longer needed. Blockchain can also substitute the trust needed for a financial transaction, as will be discussed in Chapter V.5.

Feasibility of this initiative is quite large because the demand for governmental incubators will likely drop when alternatives are available. The Chinese government will presumably encourage this change when it leads to less investments in companies that have trouble becoming independent. However, when the government will find the influence they have over innovation is worth the costs, transition to private incubators will be harder. The government also has the opportunity to keep ownership for themselves, but will then have to ensure that RegTech initiatives will be soon implemented in incubators for them to not be surpassed by 'shadow incubators' that work outside the regulation as has happened with shadow banking. The choice of incubatees should also be focussed on RegTech and FinTech initiatives in order to be aware of and make use of the latest technologies.

The RegTech innovations mentioned as examples from other countries are all based upon one notion that the financial industry works in a capitalistic and competitive economy where the regulator does influence companies in order to protect consumers, but economic factors such as supply and demand and profit maximisation account for much of the behaviour of financial institutions. This situation does not apply to the Chinese banking system, as the majority of banks is state-owned. It is therefore hard for any one bank to develop RegTech initiatives based upon economic forces and independent of state influence and interference. One can look at this influence as hampering the entire Chinese economy, and in some ways one might be correct, but this is not necessarily the case.[214] Some advantages of the centralised and hierarchical structure of the Chinese regulatory system will be discussed below.

V.4.4. Credit scores

The structure of the Chinese government can also have other benefits, e.g. in the situation of credit scores. Parties that have no access to bank-backed financing will have a second disadvantage of not having enough data upon which a credit score can be based. Their credit score is often based on past lending and repayment, as well as mortgage, income, and other factors. If these credit scores are readily available, banks could open up their markets more to these clients with less risk of loans not performing. Currently, the information is incomplete as the financial institutions solely rely on the China Credit Reference Centre for credit info, where only 2 in 5 Chinese citizens are represented.[215] Additional information to establish or refine credit scores can come from two factors. The first is all of the information that the government has about a person being centralised in one database, as to get a complete as possible profile of a lender and his or her relation with the government. The Chinese system is especially adequate for this technique, as many services are centralised and the government has a large influence over people's day-to-day activities. A profile like this can therefore lead to banking customers receiving a more fair assessment of risk and the adequate costs tied to the risk. A second approach can be to have a third party gather this information for the authority. Perfectly situated for this task are the

[214] Allen, Qian and Qian, 'Law, Finance, and Economic Growth in China' p. 41
[215] Mittal and Lloyd, *The Rise of FinTech in China - Redefining Financial Service* p. 34

FinTechs. The Chinese government also recognised this, and assigned credit scoring permits to several FinTechs for the 2020 national Social Credit System.[216] Consumers that lend and repay small amounts of money from a FinTech or pay their bills through their online wallet do build up a 'private' credit score[217]. Other factors can be taken into account as well, such as online (shopping) behaviour, location or contacts. Therefore, an overall governmental credit score can ultimately lead to consumer benefit because of better information, timeliness, lower costs, better service and better access to capital. FinTechs are already using this information[218] to base their affordance of credit on, so it is only logical for the government to create a mix between private and public information and to become the intermediary in the information available.

Disadvantages can be seen in terms of privacy, incomplete or inaccurate information, unintended conclusions from certain types of information, and potential for discrimination.[219] To mitigate the disadvantages, to ensure no such failure as in previous governmental efforts[220], and to ensure that the information is used for legitimate aims, close attention should be given to what information can and cannot be included with the appropriate independent arbiters supervising the process. Further, an opt-out option for this additional information gathering should be included. This might negatively affect a credit score (because it invites more risk through bigger information asymmetry) but should be provided as an option nonetheless for people who do not wish to partake.

Feasibility of future implementation of such an initiative is lower because while in theory this image of connecting all information can lead to consumer benefit, it does invite criticism as it would lead to a government that forces itself in the private lives of citizens thereby creating a 'totalitarian state'[221]. Pressures from outside will therefore try to hinder this initiative as much as possible, even though it could in theory lead to more access to capital.

V.5. Long-term RegTech solutions for banks, FinTechs and regulators

The following initiatives can be of use for all players in the field, but here the focus will be on the benefits and drawbacks for the Chinese government and in the end the Chinese consumer.

V.5.1. Blockchain

When looking on a longer timeline, one cannot deny the upcoming popularity in China[222] of blockchain as a disintermediating force that will closely follow and bring to demise the emergence of financial services platforms. Blockchain technique entails that a transaction of any sort will be recorded in a database that acts as a register and is duplicated in large amounts to ensure that changing one register will always stand out and therefore will not be possible (a distributed public ledger). Both parties can check whether the transactions and

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[216] Ibid p. 34

[217] Brian Kreiswirth, Peter Schoenrock and Pavneet Singh, *Using alternative data to evaluate creditworthiness* Consumer Financial Protection Bureau (16 February 2017) <https://www.consumerfinance.gov/about-us/blog/using-alternative-data-evaluate-creditworthiness/> accessed 26 May 2017

[218] The Economist, 'China invents the digital totalitarian state' *The Economist* (Beijing `17 Dacember 2016) <http://www.economist.com/news/briefing/21711902-worrying-implications-its-social-credit-project-china-invents-digital-totalitarian>

[219] Kreiswirth, Schoenrock and Singh, *Using alternative data to evaluate creditworthiness*

[220] The Economist, 'China invents the digital totalitarian state'

[221] Ibid

[222] From the side of regulators in financing Blockchain start-ups: Jamie Redman, 'Local Chinese Government Helps Fund Blockchain Startup' *Bitcoin News* (1 December 2016) <https://news.bitcoin.com/local-chinese-government-blockchain/> accessed 26 May 2017, from the side of state-owned banks Engen Tham, 'China turns to blockchain to make markets clearer and cleaner' *Reuters* (Shanghai 26 January 2017) <http://www.reuters.com/article/us-china-fintech-blockchain-idUSKBN15A368> accessed 26 May 2017, in the 13th 5 year plan Alex Hamilton, 'China hot on blockchain in latest Five Year Plan' *INB Intelligence* (3 January 2017) <https://ibsintelligence.com/ibs-journal/ibs-news/china-hot-on-blockchain-in-latest-five-year-plan/> accessed 26 May 2017

all past transactions with this unit of monetary value has been legitimate. This can therefore easily filter out illegitimate activities of companies or individuals, which creates an entire market of data driven corporate governance and oversight by governmental authorities. They will be able to analyse the origin of all monetary units and therefore filter out the potentially illegitimate transactions for further investigation.[223]

The most well-known blockchain example is Bitcoin, which has a mixed reputation because of volatility and questionable users.[224] Though, when picked up thoroughly and backed by legitimate authorities, the blockchain technology on which bitcoin is rooted can be of value in any sector. While some argue that this technology and the disintermediation it brings can replace the entire government[225], in this thesis we concentrate on what disruption it can bring to regulating the financial markets. One of the first applications for the financial sector will be the disintermediation of payment settlement through blockchain. The challenges for Asian FinTechs when it comes to clearing payments have been thoroughly discussed above. However, blockchain technique could erase their intermediary role altogether (intermediaries (such as Uber) are actually central authorities of their own platform, being just as risky and costly as regular authorities)[226], as the system takes care of security itself. On the governmental side, one will see the power of UnionPay as a centralised settlement provider even further under threat than it already is. Keeping this model of mandatory state settlement in place will not be beneficial for the government nor for emerging FinTechs. Therefore, a different model is required where less centralisation is necessary and that can cater to the needs of both openness and transparency on the one hand, and control on the other. Experts argue that such a system will be as secure as the current system, but will eliminate the risk of having a central figurehead.[227]

The disintermediating role of blockchain will need action from the government in order to keep the balance between security and risk elimination. The role of UnionPay as a regular settlement controller will fade, and instead the government needs to focus on facilitating settlements done though blockchain instead.[228] The regulation should concentrate on keeping the blockchain market transparent, on facilitating and encouraging investment in the infrastructure needed to facilitate a large scale decentralised settlement system, and on creating a good user interface for the blockchain use of the citizens. Credible candidates to fulfil this task are UnionPay or the newly established clearing house backed by, among others, FinTechs.

In other uses of blockchain, especially identity verification, the government could play a role in streamlining the KYC rules. A governmental entity can then check the identity of a person thoroughly once, and after that 'endorse' it with other entities that need identification, similar to signing in with a Facebook account on another website[229] or the Estonian e-residency authentication[230]. The problem with these two examples is the ease of

[223] Petrasic, Saul and Lee, *Regtech rising: automating regulation for financial institutions* p. 2
[224] Sam Kessler, 'The Future of Bitcoin: A Rocky Path to Currency' *Harvard Political Review* (19 January 2016) <http://harvardpolitics.com/covers/covers-winter-2015/future-bitcoin-rocky-path-currency/> accessed 26 May 2017
[225] Blocho, *Can Blockchains Replace Governments?* Steemit Blockchain (July 2016) <https://steemit.com/blockchain/@blocho/can-blockchains-replace-governments> accessed 26 May 2017; Marcella Atzori, 'Blockchain technology and decentralized governance: Is the state still necessary?' (2015) p. 8
[226] Don Tapscott and Alex Tapscott, *Here's Why the Blockchain Powers Prosperity* Fortune (22 May 2016) <http://fortune.com/2016/05/22/why-blockchain-powers-prosperity/> accessed 31 May 2017
[227] Eva Micheler and Luke von der Heyde, 'Holding, Clearing and Settling Securities Through Blockchain Technology Creating an Efficient System by Empowering Asset Owners' (Blockchain and financial markets technology: Perspectives from Law, Finance and Computer Science, London) p.4
[228] Ibid p. 11
[229] Antony Lewis, *On KYC and blockchains* Bits on blocks - Thoughts on blockchain technology (10 December 2015) <https://bitsonblocks.net/2015/12/10/on-kyc-and-blockchains/> accessed 26 May 2017
[230] Garry Gabison, 'Policy Considerations for the Blockchain Technology Public and Private Applications ' (2016) 19 SMU Science and Technology Law Review 327 p. 329; Ian Allison, 'Bitnation and Estonian government start spreading sovereign jurisdiction on the

fraud. Even though the Estonian government does check identity, this process is very light in order to increase ease of use, thus inviting fraud.[231] The Chinese government with its central authority and large amounts of information about citizens through owning many of the basic services and therefore having a large database of authentication checks, can provide that last point on control. Also, they can be the 'guardian' over a blockchain, allowing certain authorities and companies access while disallowing others (based on consumer permissions). Blockchain is also used in the Estonian initiative in order to create trust, but the problem remains of initial identification in which the Chinese government has an advantage. These changes will directly create consumer benefit as they provide added security and ease of use. They will also indirectly increase consumer benefit by enhancing the growth of FinTech and thereby competition in the financial market, leading to further innovation and cost cutting.

Currently, the PBoC is creating a blockchain cryptocurrency for the RMB, seeing advantages in terms of volatility, creditworthiness and acceptance in comparison with a privately held currency. This preference can be seen in the crackdown of Chinese regulators on Bitcoin, all but eliminating trade in the virtual currency in China.[232] The centralised issued crypto RMB will likely enjoy the same privilege as the physical variety under *The Regulation on the Administration of RMB*, in that it is forbidden to reject payment with the currency. Going through with the issuance of digital RMB by the state is an option, while the other is leaving the issuance to banks and FinTechs, and keeping to a supervising role. I would argue that the later variety will mitigate the risk for the government because the crypto RMB will then become the default currency for both banks and FinTechs, without the competition that different cryptocurrencies on the same market can bring with it, and is therefore the correct method to choose. But before the implementation, it is for the regulator to implement clear rules about how the digital RMB will be used and the position of competing digital currencies.

In order for any of these techniques to work, a major overhaul of current regulation is needed, especially in the Chinese characteristics of the law. The blockchain is by its essence a global technique that does keep into account national borders; it is irrelevant where a node in the network is located, as long as it is part of the network. Regulation that tries to keep information of certain companies within its borders (such as with the aforementioned *Cyber Security Law*) will not stand the test of time. In order for these laws to ensure some kind of protection, an object-oriented approach might be more resilient to the changes in information storage. This would then concentrate on different kinds of information and how to handle these, instead of concentrating on geography.

V.5.2. Smart Contracts

Distributed Ledger Technology can be used for more than the mere recording of identities and transactions. More elaborate logic ('computer programmes') can be implemented and distributed to many nodes, creating a smart contract. The notion was already envisioned in 1994 by Nick Szabo but regained popularity through the advancement of technology.[233] The logic in a smart contract can contain an if-this-than-that statement similar to what we find in a contract. While a regular contract can often be interpreted in many ways, the logic will execute (e.g. money will be transferred from a custodian to a party, a fine will be awarded) based on certain

blockchain' *International Business Times* (8 February 2016) <http://www.ibtimes.co.uk/bitnation-estonian-government-start-spreading-sovereign-jurisdiction-blockchain-1530923> accessed 1 June 2017

[231] Clare Sullivan and Eric Burger, 'E-residency and blockchain' (2017) Computer Law & Security Review p. 7

[232] Rocky Lee, Stanley Zhou and Andrew Fei, 'RMB as a digital currency? China successfully completes its blockchain-based digital currency trial' *King & Wood Mallesons* (6 February 2017) <http://www.kwm.com/en/knowledge/insights/rmb-digitisation-blockchain-prototype-system-china-pboc-20170206> accessed 26 May 2017

[233] Nick Szabo, 'Smart Contracts: Building Blocks for Digital Markets' (1996) <http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html> accessed 26 May 2017

factors being fulfilled (e.g. an asset transferred, a deadline missed). This is then verifiable by anyone because the contract is duplicated in all nodes. The output of a contract like this can be data, automatically checked by the regulator for regulatory compliance, relieving financial companies from the burden of actively showing their compliance with regulation. Further, amendments to contracts can be made much more easily, either because parties would want a change in their contract and have left parts amendable to later date, or legal requirements have changed that would then automatically override part of the code/contract.[234] To put this idea in more practical terms, this can be a state-owned overriding API that would change all contracts based on a certain law once an amendment is made to ensure direct compliance.[235]

A real-world example of a smart contract is a car that refuses to drive when the payments are not made in time.[236] The governmental system, however, does need to be adequately designed for these sorts of smart contracts. For the regulator this is a chance to ensure cost minimization in the financial sector for both banks and FinTechs such as P2P's that conclude many transactions per day. Nonetheless, as with any innovation, also disadvantages surface.[237] The legality of the smart-contract is still uncertain in many countries, therefore the regulator should ensure that clear guidelines are in place for such contracts. The Chinese regulator has shown signs of regulating these contracts in its 2016 Blockchain Technology and Application Development Whitepaper, outlining several uses for blockchains especially for the financial sector.[238] The whitepaper calls for international standards to be created for blockchain in the financial sector, as the industry is taking off and different initiatives propose different rules. Even though efforts are made in regulation of smart contracts around the world[239] consensus is therefore still far away, as is the enforceability of these smart contracts in court[240].

The last drawback is that the contractual secrecy upon which many transactions rely will be eliminated to ensure validity of the contract. The distributed ledger system works because the logic will be shared with anyone, but many companies want to keep certain contracts secret from competitors. A solution could be to establish a blockchain over which a governmental entity has authority to ensure a balance between validity and secrecy. But the more people are allowed to validate a contract, the stronger the contract is. This can then be accounted for in the structure and logic of said contract. There are initiatives that could store private data on a public network and still have it verifiable, often making use of zero-knowledge proofs[241]; a method that allows others to verify whether data is legitimate (as in: not tampered with) without knowing the actual contents. Any of these solutions do need a protocol with infrastructure upon which can be contracted. The task for the regulator is

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[234] Max Raskin, 'The Law and Legality of Smart Contracts' (2017) 1 The Georgetown Law Technology Review 305 p. 326
[235] Ibid p. 327
[236] Erik P.M. Vermeulen, *The Future of Law, Lawyers and Law Professors… And the Exponential Growth of Disruptive Technology* Chatbot's Life (29 March 2017) <https://chatbotslife.com/the-future-of-law-lawyers-and-law-professors-and-the-exponential-growth-of-disruptive-technology-b5c979608c9c> accessed 26 May 2017
[237] Bart Cant and others, *Smart Contracts in Financial Services: Getting from Hype to Reality* (Capgemini Digital Transformation Institute, 2016) p. 8
[238] Ye Guo and Chen Liang, 'Blockchain application and outlook in the banking industry' (2016) 2 Financial Innovation 24 p. 6-8; Bitkan, 'Chinese MIIT Publishes Blockchain Whitepaper, Focusing on Financial Applications' (2016) <https://bitkan.com/news/topic/24411> accessed 26 May 2017; Samburaj Das, 'The Chinese Government Publishes an Official Blockchain Whitepaper' *Cryptocoins News* (20 October 2016) <https://www.cryptocoinsnews.com/chinese-government-publishes-official-blockchain-whitepaper/>; Oriental Fortune Network, 'The Ministry of Industry and the chain of white paper out of the world as the primary application ' *Eastmoney* (18 October 2016) <http://finance.eastmoney.com/news/1350,20161018674306331.html> accessed 26 May 2017 (translated)
[239] E.g. Arizona State, legislature. House Bill 2417 Chapter 97 (6 Feb. 2017). Introduced by Representative Weninger; Vermont State, legislature. H.868 Act 157 (2 June 2016). An act relating to miscellaneous economic development provisions; In Singapore the Electronic Transactions Act (31 December 2011) *Chapter 88* allows electronic offer and acceptance.
[240] Cant and others, *Smart Contracts in Financial Services: Getting from Hype to Reality* p. 8
[241] A. Kosba and others, 'Hawk: The Blockchain Model of Cryptography and Privacy-Preserving Smart Contracts' (2016) 2016 IEEE Symposium on Security and Privacy (SP) 839 p. 2

therefore to perform a leading role in the standardization of blockchain technology, especially in smart-contracts.

The public blockchain is not the only form in which it can exist, Vitalik Buterin (founder of Ethereum) said already in 2015 that '[i]n general, the idea that there is "one true way" to be blockchaining is completely wrong headed, and both categories have their own advantages and disadvantages'[242]. Many blockchain purists are of the opinion that a private blockchain cannot work as it perverts the notion of having a decentralised system. Furthermore problems could arise concerning lack of transparency that would otherwise create trust[243] and protection of the user (consumer) against the administrator. However, when compared to the public alternative the ease of changing rules, the known identity of validators and increased privacy are advantages. As both private and public systems do have their drawbacks, a compromise between the two might be more useful to implement by the Chinese government in order to, among others, regulate and oversee payment and investment. A consortium blockchain would enable the government to be a node and gatekeeper in a blockchain system regulating payments between consumers in order to have control and oversight, but share this responsibility with other well-regarded nodes in the system (of which a subset needs to sign a block to ensure its validity). These other nodes can be financial institutions, other governmental authorities, FinTechs, etc.: any entity that instils trust of the consumer in the system. On this blockchain investors, SMEs and consumers can find a trading partner in order to fulfil the investment needs and contract with them without the use of an intermediary but with governmental oversight and state regulation applying to all smart contracts executed. A program does not need to be developed, merely a protocol on which the contracts can be executed with governmental oversight. The interfaces can be created by other developers[244] with an open standard underlying all programmes[245], like the e-mail and internet protocol currently in use.

Even though this does lead to an extensive switch in the regulatory system that goes much further than mere modifications, the Chinese regulator will not have much choice as to adopt this technology. There is clearly demand for these decentralised techniques and in order to stay a front-runner with influence over the economy and society at large, they will be forced to apply blockchain techniques. It is advisable to do this as fast as possible, while no others have set up blockchains of a national scale which would then need to be competed against.

V.5.3. DAO

Even though Decentralised Autonomous Organisations (DAOs) have had a controversial start where the foundations upon which a blockchain is built were violated[246], my opinion is that in the future this form of organisational structure will prevail. DAOs are essentially 'long-term smart contracts that contain the assets and encode the bylaws of an entire organization'.[247] All participants in such an organisation obtain a 'share' in the company (often denoted as crypto coins in a digital wallet) and can vote on every decision that the company makes. Applications for this can be seen in disintermediation of investment banking, but also – as Buterin

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[242] Vitalik Buterin, *On Public and Private Blockchains* Ethereum Blog (7 August 2015) <https://blog.ethereum.org/2015/08/07/on-public-and-private-blockchains/> accessed 26 May 2017

[243] Aaron Wright and Primavera De Filippi, 'Decentralized Blockchain Technology and the Rise of Lex Cryptographia' (2015) Social Science Research Network 58 p. 38

[244] James Overden, *Blockchain Will Enable A Real Sharing Economy: Disrupting the disruptors* Innovation Enterprise (21 July 2016) <https://channels.theinnovationenterprise.com/articles/blockchain-will-enable-a-real-sharing-economy> accessed 31 May 2017

[245] Mihaela Ulieru, 'Blockchain Enhances Privacy, Security and Conveyance of Data' *Scientific American*, (2016) <https://www.scientificamerican.com/article/blockchain-enhances-privacy-security-and-conveyance-of-data/> accessed 5 June 2017

[246] David Yermack, 'Corporate Governance and Blockchains' (2017) 21 Review of Finance 7 p. 28

[247] Vitalik Buterin, *A Next Generation Smart Contract & Decentralized Application Platform* (Ethereum White Paper, 2014) p. 1

proposes – in other fields where it consists of a 'decentralized autonomous community'[248], e.g. where all members can decide upon lending money to SMEs or consumers. This technique has not been implemented very much yet and it seems that the big FinTechs have not taken up this opportunity in China. It would undermine their intermediary role, but provide opportunities in creating infrastructure for these DAOs.

Even though the technique is upcoming, the Chinese government should already ensure that adequate regulation exists for companies that are structured around code instead of people. To avoid becoming the hindering factor in this innovation, the government could set up standards for such companies, and create a safe environment in which DAOs can be developed. Further, DAOs can also be used by the government itself for governmental tasks e.g. speeding up the decision process when amending and implementing new law or, concerning the State-owned banks, so many experts in different fields can decide over giving loans to certain enterprises.

With the above examples the regulator can come much closer towards adequately regulating the Chinese FinTechs to bring consumer benefit in the financial services industry. Short-term solutions ensure that FinTech will be able to disrupt the market, but in a controlled manner. The balance between consumer protection and enhancing innovation can be held much more nuanced than has been in the past. It is inevitable that the Chinese regulators will want to hold influence and not leave consumers protection up to market forces. Therefore, the proposed long-term solution of a consorted blockchain will be most viable, as well as developing standards upon which blockchain transactions can take place in a safe and controlled manner. DAOs might not be in use very much yet, but the government should be aware of these developments and see the public opportunities this brings.

VI. CONCLUSION

There can be no doubt that the Chinese banking system is influenced by FinTechs, an effect that only will increase in the future. Though FinTech is not a completely new phenomenon, current companies can form real threats to incumbent financial institutions by giving access to parties that did not have access to finance and therefore had to resort to shadow banking. The once closed financial market that could benefit from regulatory burdens to entry is becoming more attractive to new innovations, and bargaining power is growing from all sides. Due to a 'hands-off' approach from the regulator FinTechs were allowed to grow and innovate nearly unconstrained, which majorly contributes to their success. Next to increased growth and benefits to consumers through lower costs and ease of use, lack of regulation also lead to scandals and misbehaviour that hurt consumers.

Therefore, the Chinese regulator stepped in and set up a stringent regulatory system that includes the FinTechs and constrains them on many different factors. Some of this regulation is well-needed to ensure a healthy evolution of the FinTech industry, while other regulation puts an undue burden on new companies. The regulator tries to find a fair balance between consumer protection and helping innovation, but also seems to be influenced by interests of incumbent banks and other financial institutions. These incumbents are often (formerly) state owned through which their interests of continuing to exist and persisting in current business models are aligned with the regulator. This, among other factors, has resulted in the regulator enforcing legislation that is too strict and hinders innovation, thereby giving consumers the disadvantage of not being able to profit from digitization of financial products.

[248] Ibid, p. 23

The EU and US FinTech markets are growing quite differently from the Chinese market. While the manner in which these markets came into existence is quite different in terms consumers having access to finance and the development of banks, one of the major factors driving the discrepancies is the manner in which the regulators have dealt with the FinTech revolution. Contrasting to China, both regulatory systems have more closely regulated FinTechs from the start (either with specialized regulation or with broad regulation that also covers FinTechs). However, the reactive and fragmented approach of the US leads to uncertainty and therefore less VC investment. The EU, on the other hand, sees growth partially because of a more proactive approach that leaves room for FinTechs to manoeuvre within the current system.

We can answer the question of whether the Chinese FinTech Industry – currently and in the future – is adequately regulated to bring consumer benefit in the financial services industry, with a resounding no. While the regulation is (mostly) good intended it will not provide enough room for innovation, nor will it be able to handle disruption in the financial market.

Solutions to China's balancing act between protection and innovation can be achieved by taking a pro-active approach in regulating. A major contributor for adequate regulation is technological advancements that can help analyse and predict the behaviour of FinTechs under current and new laws. RegTech can help both in the short- and long term. In the short term a regulatory sandbox can enable both innovation for FinTechs and certainty for regulators, direct consumer feedback through digitized means will ensure that good intentions actually lead to beneficial regulation, the combination of large amounts of information can lead to less financial risk for FinTechs, banks and consumers, and private incubators can kick-start innovation. In the long term the idea of intermediaries will become less relevant because these services can be executed through smart contracts on a blockchain network. In order to stay relevant and in control of consumer protection, the Chinese regulator should actively engage in this technique and set up its own consortium blockchain on which consumers can interact with private and public entities, where they can ensure consumer safety as well as create transparency and aiding innovation. By creating a protocol on which contracts can be executed, they remain in control while still giving consumers the freedom to directly contract with companies and authorities. This will be a win for consumers, as they do not have to choose between being protected and being able to use the latest financial innovation.

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	2015	Administrative Measures on Online Payment Business of Non-Bank Payment Organisations; *People's Bank of China*	27
	2016	Interim Measures on Administration of the Business Activities of P2P Lending Information Intermediaries; *CBRC, MIIT, the Ministry of Public Security of the People's Republic of China and CAC*	26, 27
	2016	Business Guidelines for P2P Fund Custodians; *China Banking Regulatory Commission*	27
	2017	Draft rules on the national security review of online products and services used by PRC information systems; *Cyberspace Administration of China*	31
US	1914	Federal Trade Commission Act (15 U.S.C. §§ 41-58, as amended); *Federal Trade Commission*	39
	2012	US Jumpstart Our Business Start-ups (JOBS) Act (5 April 2012)	9
	2015	*In the Matter of Ripple Labs Inc. and XRP II, LLC*, 2015-05 (Financial Crimes Enforcement Network, 5 May 2015)	40
	2016	Vermont State, legislature. H.868 Act 157 (2 June 2016). An act relating to miscellaneous economic development provisions	52
	2017	Arizona State, legislature. House Bill 2417 Chapter 97 (6 Feb. 2017). Introduced by Representative Weninger	52
EU	2009	E-Money directive ('EMD'); Directive 2009/110/EC	37
	2007	The Payment Services Directive ('PSD'); Directive 2007/64/EC	37
	2013	Capital Requirements Directive ('CRD'); Directive 2013/36/EU	9
	2013	Capital Requirements Regulation ('CRR'); Regulation No. 575/2013	9
	2014	Regulation on Electronic Identification and trust services ('eIDAS'); Regulation No. 910/2014/EU	37
	2015	The Payment Services Directive 2 ('PSD2'); Directive 2015/2366/EU	37
	2015	The Anti Money Laundering Directive ('AMLD'), Directive 2015/849/EU	37
Singapore	2011	Electronic Transactions Act Chapter 88; *Parliament*	52
Basel	2018	Basel III; *Basel Committee on Banking Supervision*	8, 43
	2018	Basel III net stable funding ratio ('NSFR'); *Basel Committee on Banking Supervision*	15
WTO	2001	Accession of the People's Republic of China; *World Trade Organization*, (WT/L/432)	22
	2013	DS413: China — Certain Measures Affecting Electronic Payment Services (WTO Dispute Settlement Body)	11