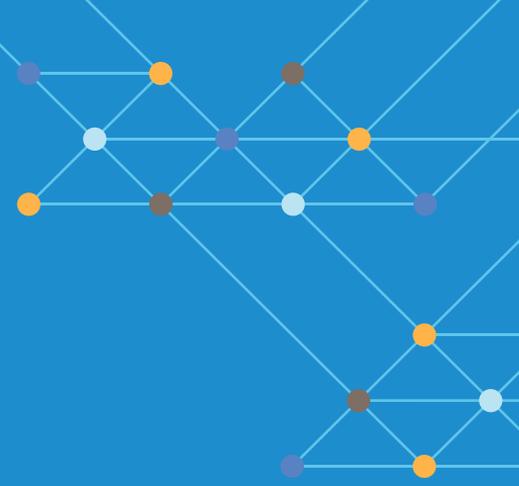




CFA Institute



# FINTECH 2018

THE ASIA  
PACIFIC EDITION







CFA Institute

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PACIFIC EDITION

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September 2018

*What will be the most interesting trends on Fintech going forward? This Fintech report provides insight, analysis and identifies trends on developments in blockchain, artificial intelligence and more. It is a comprehensive study designed to inform people in the industry about upcoming trends, and help them better understand and manage the issues, opportunities, and challenges ahead.*

*Nick Pollard, Managing Director, Asia Pacific, CFA Institute*

# Acknowledgement

In addition to the experts who contributed to this volume and spoke at our events, many colleagues at CFA Institute on both sides of the Pacific have worked tirelessly to make this happen. I would like to thank specifically Rob Gowen, Rhodri Preece, Brenda Hou, Oscar Tai, Joseph Wong, and Joyce Chan for their support. Nick Pollard kindly provided an endorsement for this volume. Go team!

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# PREFACE

Following the popularity of *FinTech 2017: China, Asia, and Beyond*, we have compiled this new report this year to provide our members, industry professionals, and other stakeholders an updated overview of the FinTech landscape in the Asia Pacific region.

As we stated in the introduction to last year's report, the reason we entered the field of FinTech research is to bring more clarity to the question of how FinTech will affect the prospects of financial institutions and careers of our members and other stakeholders. The goal remains the same in this year's *Asia Pacific FinTech Connect* initiative, although with an expanded scope.

For the Asia Pacific FinTech Connect initiative this year, we have expanded the scope from three perspectives: the "Fin" and "Tech" in FinTech plus the main financial markets in the region.

The first section of the report covers the various businesses under the "Fin" umbrella, including banking FinTech, robo advice, insurtech, and regtech. The second section reviews the progress in "Tech" that's relevant for financial institutions, namely artificial intelligence, big data, cloud computing, and blockchain. The last section covers major FinTech developments in key Asia Pacific financial markets, including Australia, Japan, India, Singapore, and Thailand, in addition to China and Hong Kong SAR (covered in last year's report).

Our approach remains largely the same as last year, that is [to avoid repetitive word usage] we identify key issues in Fintech's development in Asia and explore these issues with a group of experts, who we then invite to speak and/or write for us on the issues identified. We have also written summary articles based on common themes that emerged across various markets. In many cases, we include interview notes from conversations we had with the experts so that our readers get access to the first-hand information.

As in last year, we continued to focus on three types of profiles in our expert selection process: (1) generalists such as researchers, regulators, and VC investors, (2) financial institution representatives, either their technology or business leaders, and (3) technology innovator representatives, including both tech giants and FinTech start-ups. We believe this well-defined ecosystem was critical to achieving our objective and generating unique insights on the issues at hand.

Finally, I'd like to mention that this report is not intended to be read as a book from start to finish but is a compendium of articles, interviews, and conference content that can be read in any order. We wanted to provide you with comprehensive coverage of the issues that we believe are important in the development of FinTech in the Asia Pacific region, so that you can zoom in on any particular topic that interests you.

Larry Cao, CFA

# INTRODUCTION

Ever since CFA Institute began looking into FinTech, the question about FinTech's definition has never completely dropped by the wayside.

In many ways, the differing definitions of FinTech reflect differences in focus and purpose. Our own thinking and objectives in covering the topic for our members have shifted over the last few years, leading to an evolution in how we define FinTech.

## What did we learn in the early years of FinTech?

In business, people are constantly looking for an edge. The same was true when we entered the exciting and yet mysterious world of FinTech research in 2016.

Our objective then was to answer our members' questions: Will my job be replaced by FinTech? If so, how soon? We listened to those in the field, and all we heard was disruption, disruption, disruption.

We quickly realized why and how we could add value. FinTech was a very new concept back then so the "opinion leaders" were mostly FinTech start-ups. The disruption talk reflected their mission and was also their battle cry. What many of them were missing were two important stakeholders in the FinTech ecosystem: the financial services establishment and, perhaps more importantly, regulators.

With this enhanced understanding of the ecosystem, we wrote in an article<sup>4</sup> published in May 2016 that "the most ideal development for FinTech firms is to collaborate with banks." Our call to action embodied two messages:

1. Financial institutions and technology innovators both have skills that are difficult for the other to replicate, so their best chance is to work together, with each focusing on its strengths.
2. Business-to-consumer (B2C) has proven to be too costly for most FinTech start-ups, making business-to-business (B2B; i.e., partnering with financial institutions by providing technology solutions) the only chance many start-ups have.

Our ideas have been echoed numerous times in the ensuing two years, as we have learned in speaking with practitioners in the field. The most interesting case for us was the collaboration announced by Microsoft and ChinaAMC (one of the top mutual funds in China) in the summer of 2017, as the two partnered to work on investing and investment advice, fields that are very close to our heart. Subsequently, all major Chinese banks signed similar deals with major partners. In January 2018, Warren Buffett's Berkshire Hathaway announced a collaboration with Amazon and JP Morgan to enter the online health insurance field together.

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<sup>4</sup>Larry Cao, "FinTech and the Future of Financial Services," *Hong Kong Economic Journal*, May 2016. <http://startupbeat.hkej.com/?p=29681>

## What does the future hold?

Our definition of FinTech at the time was new technologies in finance and, by that, we mostly meant blockchain, robo advice, mobile payment, and peer-to-peer (P2P) lending.<sup>5</sup>

That definition has clearly evolved. Once we decided that the majority of these new businesses were not threatening the establishment but mostly complementing it, we decided to pursue technologies that the industry and our members could embrace for a competitive advantage.

Specifically, we set out about a year ago to study the potential impact of artificial intelligence, big data, cloud computing, and blockchain on financial services, especially lending, payments, robo advice, and insurance in major financial markets in the Asia Pacific region. Thus, our definition today has more granularity in terms of both the "Fin" and the "Tech" that comprise FinTech.

Over the past year, we sought out experts from financial institutions, technology innovators, regulators, investors, and research firms. This volume is the result of our collaborative efforts. Our main conclusions are as follows (spoiler alert!):

- Artificial intelligence, big data, and cloud computing have made it possible for teams armed with better technology resources to outperform those that are not.
- Blockchain may have profound implications for the way financial institutions operate in the future. The technology is not yet mature and will need to overcome hurdles with respect to developing a sustainable business model and gaining regulatory approval.
- China leads the Asia Pacific region in FinTech development with its focus on the new technologies mentioned above; in many other Asia Pacific markets FinTech is still defined by alternative lending, mobile payments, robo advice, etc.

## Looking forward

Just as this volume was going to print, we received PwC's *Unicorn CEO Survey 2018*.<sup>6</sup> Among other findings, it indicates that 54% of responding CEOs see collaboration as the key for success while only 23% think developing internal solutions is a better idea.

In another recently published PwC report,<sup>7</sup> researchers find the B2B model will be the dominant business model compared to the historically more popular B2C model.

Sound familiar? We are glad we have been on the right track and would like to thank all of you who have helped in the creation of this volume.

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<sup>5</sup> *FinTech 2017: China, Asia, and Beyond*, CFA Institute, May 2017, p. 3.

<sup>6</sup> <https://www.pwccn.com/en/research-and-insights/pwc-unicorn-ceo-survey-2018.html>

<sup>7</sup> <https://www.pwccn.com/en/services/consulting/publications/new-trends-technology-enabling-to-b-services-whitepaper.html>

# I. OVERVIEW

# THE ROADMAP FOR FINTECH DEVELOPMENT<sup>4</sup>

Larry Cao, CFA

FinTech has taken the financial services industry by storm.

According to Google Trends, current interest in FinTech globally is 10 times as high as that three years ago. There's been much talk about disruption, particularly earlier in this period. So how will FinTech develop? Will it replace or enhance the financial services industry? Hanging in the balance is far more than the future of FinTech start-ups.

Over the last two years, CFA Institute has spoken with many financial institutions, FinTech entrepreneurs, regulators, researchers, technology companies, and venture capital investors across the Asia Pacific region. We believe clear patterns are emerging in FinTech's growth, both in terms of the popular areas of activities and in the stages of development.

## Stage 0: The Pre-FinTech Years

Recall how everything looked before FinTech came onto the stage?

The information technology (IT) departments at financial institutions have universally been big spenders. The money went to not only hardware vendors such as IBM and EMC and software vendors such as Fiserv and Oracle, but also to IT service vendors in addition to in-house teams.

Money could not buy happiness though, at least not in banking IT. The regulatory and security burden made it extraordinarily hard to update systems at a financial institution. Often management would have to sacrifice user friendliness out of concerns that putting in a new system could give rise to compatibility and system stability issues.

Financial institutions also were complacent. Because they reaped high margins when serving their top clients, they have not been aggressive as a group in serving the unbanked and underbanked.

Typical Stage 0 Companies: financial institutions. They purchase and develop technology solutions at will.

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<sup>4</sup> An earlier version of this article was published in ASEAN FinTech Census 2018, Ernst and Young, February 2018, p. 28.

## Stage 1: The Early Days

Some entrepreneurs smelled opportunities. They wanted to offer services with improved user friendliness. They also wanted to leverage low-cost technology solutions to reach out to the unserved and underserved segments that financial institutions were not able to cover profitably.

Peer-to-peer lending, mobile payment, and robo advice were the three areas with the most activity around the world in the early days of FinTech development. The United States was unequivocally the leader in this stage, with many pioneers entering the FinTech business before the term FinTech was even coined. PayPal, Betterment, Wealthfront, and Lending Club are examples of early movers.

By and large, major financial markets in the Asia Pacific region (APAC) entered Stage 1 around 2015–2016. China has clearly been the leader in the region, with current FinTech leaders such as CreditEase, Lufax, and Ant Financial (AliPay) opening doors for service largely around the same time as the US FinTech pioneers.

Typical Stage 1 Companies: FinTech start-ups and venture capitalists. Together they have created much buzz and disturbed the sweet dreams of a sleepy industry. The disruption talk was overblown though. In most markets, successful FinTech start-ups, such as the ones we mentioned, have chosen to serve the unserved and underserved. For example, CreditEase lends mostly to borrowers that banks would not lend to; AliPay entered the market only because lack of payment services became a hurdle for its e-commerce parent Alibaba to grow.

## Stage 2: The Power of Collaboration

The most significant development signaling the entry into Stage 2 for a market is the active collaboration between powerful players from both the financial services and technology sectors.

In May 2016<sup>5</sup>, we hypothesized that "the collaboration between powerful fin and powerful tech is the most promising path to powerful FinTech." Since then we have seen some high profile announcements, such as the closely-watched deal on AI (artificial intelligence) between ChinaAMC, a Chinese mutual fund, and Microsoft first announced in June 2017 and a similar one between Bank of China and Tencent.

Although such collaborations are still in their early stages, we believe they are promising for three reasons:

1. **Mutual respect.** Stage 1 is marked by the mutual "loathing" of financial service executives and technology innovators for each other. Start-ups can fall victim to their own disruption dreams. Financial institutions, on the other hand, do not believe start-ups know the first thing about finance. Even just starting down the collaboration path is significant, as it indicates that both parties have come to realize that they can help each other.
2. **Domain expertise.** Success in both finance and technology requires deep expertise built up over time and surmounting a variety of entry barriers or "moats." Equal partners may benefit from the balanced perspective and access to domain expertise that collaboration can bring.

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<sup>5</sup> <http://startupbeat.hkej.com/?p=29681> (article in Chinese).

3. Culture. Both fin and tech professionals agree that their corporate cultures are dramatically different. Partnerships allow them to work together without having to adopt each other's culture.

For anyone still harboring doubts, the announced joint venture in early 2018 between Amazon, Berkshire, and JPMorgan should put those doubts to rest.

Typical Stage 2 Companies: leaders in financial services and technology.

## Stage 3: Nirvana

Compared to the rapid changes we have been witnessing, Stage 3 will be marked by relative stability. The market positions of key players will remain stationary as the pace of progress in technology and financial markets slow down.

We believe that, in Stage 3, the industry will be dominated by successful Stage 2 companies, i.e. linkups between powerful financial institutions and powerful technology innovators. They have an edge in resources and expertise compared to the average firm in their respective industry. We believe collectively they could control about two-thirds of the FinTech market.

The remaining market share will largely be taken up by successful Stage 1 companies. The first-mover advantage they gained over the Stage 2 companies secured a customer base for them and allowed them to build up their brands despite their otherwise smaller size and fewer resources compared to successful Stage 2 companies. The competitive landscape has become far more challenging since Stage 2 companies entered the game, though. Aside from the inhibitive customer acquisition cost and heavy regulation, gaining a customer's trust that she'd allow you access to her money is far more challenging than, say, getting her to surf your online store.

Stage 0 companies will likely be largely phased out if they resist change and hold on to the legacy systems, although the precise timing is uncertain. A likely scenario is that customers will move their businesses to successful Stage 2 and Stage 1 companies over time, so that eventually firms running the legacy systems will become unprofitable. This trend will accelerate as customers from the more tech-savvy younger generations become the main customer base for financial services.

Typical Stage 3 Companies: A small number of successful Stage 2 companies will dominate the market with a larger number of successful Stage 1 companies taking up the remaining market share.

American futurologist Roy Amara once said, "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run." We believe this applies to the case at hand. Although collaboration is the name of the game at this point, the risk of long-term disruption is real. FinTech players worldwide will serve their shareholders, clients, and employees well by actively planning and executing a strategy that will improve their chance of success through the three stages of FinTech development.

# THE FUTURE OF FINTECH IN BANKING

Tian Jiang, CFA

Banks need to reposition themselves and find suitable development strategies to revolutionize their business with the help of FinTech. Because the financial/banking industry tends to be very traditional, however, technology companies should focus on the integration of technology innovation and scenario application to achieve success in the finance sector.

## Artificial Intelligence

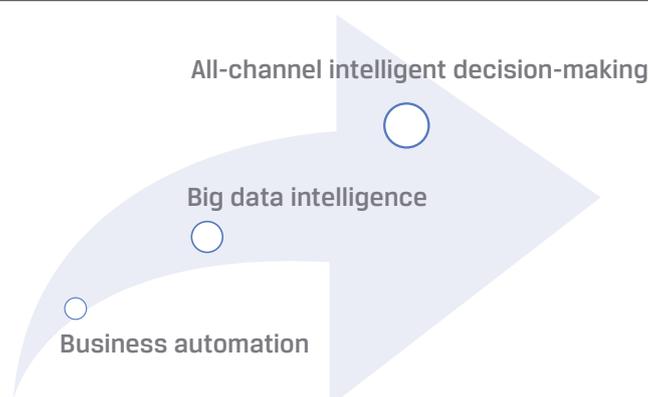
Artificial intelligence had a huge impact on the banking industry in 2017. From a technical point of view, artificial intelligence application can be divided into two categories: basic AI and industry AI. Basic AI can be integrated into application systems, such as facial recognition, speech recognition, etc. Industry AI has more application in business, such as anti-fraud, robo-advice, and so on. At present, mainstream artificial intelligence technology is data-driven machine intelligence. The difference between the two categories mainly lies in who takes control of the data or who uses the data to produce the AI models.

Based on the level of technical development at a company, we divide the application of artificial intelligence into three phases, as shown in Figure 1.1):

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**Figure 1.1 Application of Artificial Intelligence**

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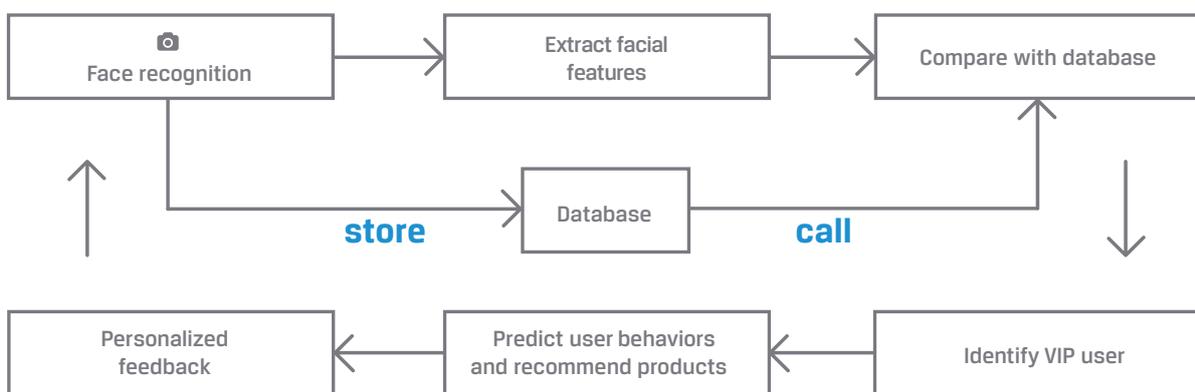
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The first stage is business automation, that is, banks revolutionize their products and processes and replace repetitive work with AI. In the first stage, production efficiency can be continuously improved (e.g., through the use of smart contracts and robo-advice). In addition, the introduction of basic artificial intelligence applications such as biometrics in mobile banking, smart counters, and other scenarios can solve the key problem of customer verification. AI not only can optimize business processes but also can greatly enhance the user experience and pave the way for the next stage of development.

Big data intelligence is the next stage of AI development. Technological innovation will bring more use cases, which in turn are supported and driven by big data. In fact, the research and application of big data in banks started before the application of artificial intelligence. The current emphasis is on the integration of basic AI and industry AI so as to provide better services for customers.

The combination of big data and basic AI can improve the intelligence level of system products and business processes. Key technologies, however, need to develop independently, including customer profiling, product profiling, behavior analysis, personalized recommendation engines, etc. Banks need to form their own AI R&D capability, which is also the key to using big data in its core competencies (Figure 1.2).

**Figure 1.2 Big Data and AI**



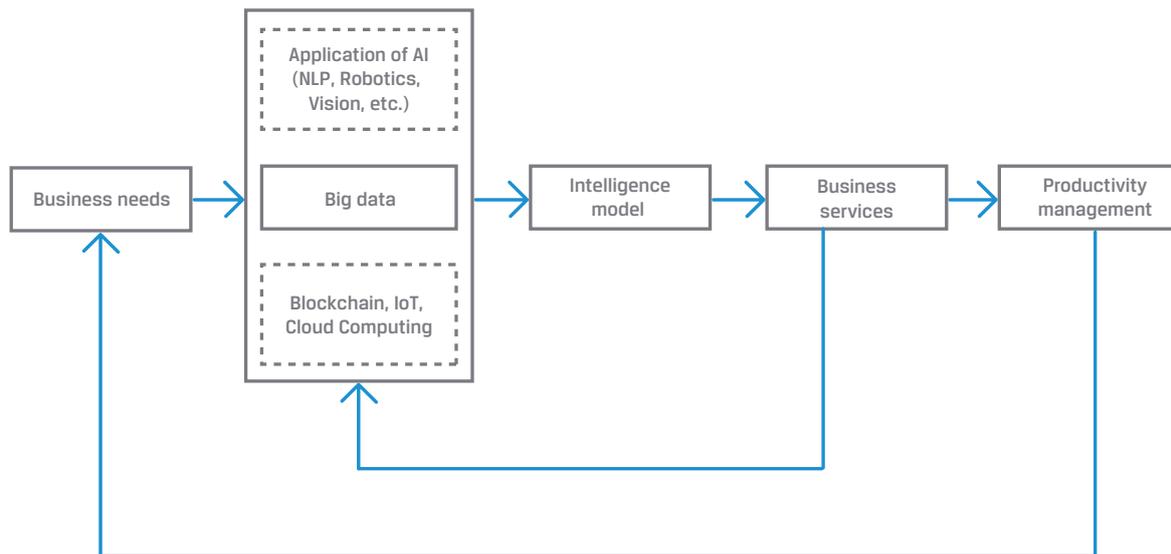
The third stage in AI development is to fulfill all-channel intelligent decision making, seamlessly connecting customer identification, behavior prediction, and all other channels and updating dynamic optimization based on customer response. The bank should build internal consensus and establish an effective cooperation mechanism from business process to system development, from product design to marketing support, and from data analysis to data mining.

## Big Data Applications

In recent years, big data has been widely used in many fields of banking, progressing from data analysis reports to data mining models and then to data products.

Data, use cases, and modeling are the three basic elements for banks in applying big data. Actually, it is possible to start data-led product development in any of the three ways. For example, transforming the business into one that uses big data applications might begin with the data analysis used in the bank's traditional business. Finding the application direction or use from the internal and external data in the bank might relate to big data risk management and marketing. Finally, businesses need innovative models and technologies to solve new problems. According to the 80/20 rule, most big data applications must be derived from business analysis and do not necessarily require "huge" data and "esoteric" technology, which is a major concern in practice (Figure 1.3).

**Figure 1.3**



The widespread use of big data in banks is accompanied by a strong, two-part demand for data asset management: 1) the sharing and application of the internal and external data, and 2) data mining, intelligent model management, and knowledge transfer. The first part lays the foundation for the big data application and provides the raw data material; the second part represents the derivative asset, which provides the added value of the big data but also holds the potential to be exported. The management mechanism of these two parts is also a relatively new topic in the industry and is still in its infancy.

Banks that achieve breakthroughs in multiple domains can try to set larger goals (e.g., establishing an efficient data value chain in the field of risk management marketing and other fields) and gradually establish the initial AI framework so as to connect the needs of many fields. A pragmatic AI-brain prototype needs to include customer profiles, product profiles, data mining models, and decision engines. Data mining models are the core of this kind of intelligence. Customer profiles and product profiles provide continuous input to the modeling process. The decision engine transforms model output into actual business actions. The big data process capabilities are primarily reflected in three aspects: improved customer perception, more intelligent algorithms, and faster decision support.

## Cloud Computing

Cloud computing is the use of the internet to access applications, data, or services that are stored or run on a remote server. Typically, cloud computing exists at one of three levels: Infrastructure-as-a-Service (IaaS) at the bottom, Platform-as-a-Service (PaaS) in the middle, and Software-as-a-Service (SaaS) at the top. The infrastructure layer aims at releasing the productivity of underlying resources while PaaS serves as the core platform hosting applications.

The development of the infrastructure layer is constrained by many objective conditions in the bank, including technical barriers, computer facilities, electricity, and other problems. In business and application expansion planning, consideration of how to solve these

problems should happen first. Considering the platform layer of bank cloud computing from the FinTech perspective, besides the standard development middleware, we try to make it the platform of other three major technologies (ABD). Based on the in-depth development of open source technology, it is possible for the bank to build a platform with independent intellectual property rights. For small and medium-sized financial institutions, it is more economical to use the PaaS platform provided by large institutions than to pour money into innovative applications.

Finally, the software layer directly provides the application corresponding to the business scenarios. It can be cloud banking services, such as cloud payments, or cloud FinTech services, such as risk management, marketing, operations, and other intelligent data products, or even more basic data services.

## Blockchain

Two factors are limiting the adoption of blockchain:

1. The technology is not mature. Its performance, privacy issues, operation, and maintenance are not up to standards for enterprise use.
2. The business model is not ready. In a multi-center scenario, it is difficult for different parties to reach consensus.

To be sure, this doesn't mean that blockchain is not good enough, but rather, that good projects are lacking in the blockchain space. Blockchain 1.0 is the digital currency represented by bitcoin; blockchain 2.0 is the smart contract platform represented by Ethereum. Blockchain 3.0 is moving forward in the fields of cryptography, consensus algorithms, cross-chain fusion, performance optimization, and so on.

In addition, the development of fiat digital currency may become a breakthrough point for blockchain. Although there is no direct connection between them, it can be expected that the emergence of fiat digital currency will provide great potential for the development of existing blockchain applications. Finally, compared with AI, big data, and cloud computing, blockchain applications are entirely technology-driven. Applying such "pure" technology is well worth our effort in my opinion.

This article discussed FinTech development in the banking industry. Big data will be fully integrated in the other financial sectors in 2018. Banks can only develop a global perspective by building their foundation on big data.

# WHY ROBO-ADVISERS ARE ON THE RISE IN ASIA\*

Larry Cao, CFA

2016 underlined the slow but steady rise of robots across Asia. The region witnessed the launch of several robo-advice services, such as Acorns, Clover, and Sixpark in Australia, Xuanji in China, Theo and Wealth Navi in Japan, and Bambu and Mesitis in Singapore. This is just the beginning.

Independent robo-advisers have been around for a few years in the United States, after launching amid the doldrums following the global financial crisis. Betterment, the first and largest independent such platform, launched in 2010 and currently manages over \$7 billion in client assets.

Robo-advisers use algorithms to build exchange-traded fund (ETF) portfolios that broadly meet the risk appetite of each investor. They have flourished by targeting aging, middle-class investors relatively comfortable with technology and with some wealth who don't qualify for private banking or similar advice. These platforms charge low fees too—a key asset, given what has been a multi-year low-yield environment.

## Maturity Counts

Robo advisers will initially make headway in Asia Pacific's most mature markets. Australia gained Asia Pacific's first robo adviser in 2013. Hong Kong, Singapore, and Japan have followed.

At the other end of the spectrum, in developing Asia, the concept of financial advice—let alone automated financial advice—has a long way to go.

China lies between. It has a huge and aging population, but financial education is still lacking in much of the country, with cash still the largest component of household assets. However, there is immense potential for robo-advisory investing. Indeed, some start-ups offer technology-led investing services more active than the typical robo model.

## Bank Robots

Eventually, financial institutions are likely to come to the fore in marketing robo-advising in Asia—as in the United States, where Charles Schwab launched its own such offering, Intelligent Portfolios, in 2015. The service, which charges no advisory or account services fees or commissions to clients, now manages more assets than the two largest independent robo-advisors combined.

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Asia's banks make handsome profits from promoting funds to retail investors. However, as robots find their footing, companies will likely recognise that if they don't cannibalise themselves with their own robo-advisers, competitors will.

Examples are already emerging. Nomura launched Goal-Based in November 2016. Mizuho Bank of Japan and Australia's Macquarie offer web services that provide portfolio optimisation but do not manage client assets. Expect more such services, initially in Australia and Japan, but increasingly into Hong Kong, Singapore, and further afield too.

## Cyber-Services

While some banks will build robo-advisers, others will tie up with existing operators. This can benefit both parties. Independent robo-advisers have found it costly to acquire customers, and have begun to realise they are better at developing intuitive financial technology than attracting customers. Meanwhile banks have large customer bases, but struggle to develop genuinely appealing technology. That is likely to lead to more acquisitions and partnerships.

There are two other important trends to keep an eye on. First, Chinese internet giants such as Alibaba and Tencent will play an increasingly important role in providing financial advice. Meanwhile, inclusive finance is proving the most active force across developing Asia.

There is a famous saying in the technology world: "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run." This applies equally to the impact of robo-advice.

# FUTURE TRENDS IN INSURTECH

Li Hongyu & Peng Yuxiang

The development of technology has greatly improved the ecosystem for the insurance industry. Insurtech is opening a bright new horizon.

Insurtech refers to insurers using technology to make it easier for their clients to choose the correct product and settle their claims while also improving the insurer's distribution capability, risk assessment, and pricing.

The Insurance Society of China listed in a 2017 white paper the following as the 10 most important technologies that will affect the development of the insurance industry in China: blockchain, artificial intelligence, Internet of Things, cloud computing, big data, telematics, driverless cars, unmanned aerial vehicles, DNA genetic testing, and wearable devices.

Insurers are already using the internet to improve the services they offer, from initial underwriting to claim settlement. Some companies have introduced big data and artificial intelligence (AI) into their business. Although unlikely to completely replace humans, AI, which is currently best described as computational intelligence applied to big data, will make insurance services more intelligent through intelligent pricing, precision marketing, anti-fraud, and other technical measures.

Because of these changes, insurtech will likely eliminate many manual work positions and automate the entire insurance process.

## Applications

Insurtech plays an increasingly important role in customer service. According to Accenture's 2017 Global Distribution & Marketing Consumer Study, 74% of consumers are willing to get recommendations from a robo-advisor.

Consumers expect personalized solutions and insurtech helps insurers provide the most optimal solution after reviewing each customer's profile using preset standards and risks. Robo-advisors can provide customized services through voice interaction, accurate delivery, and intelligent recommendations, which are based on voice recognition, natural language processing (NLP), recommendation systems, and other related technologies.

## Risk Assessment

The specific risk for various customers looking at the same product can be different. Identifying these risks in the marketing promotion is helpful. Take, for example, health insurance. A customer who is at high risk for a cancer but at low risk for cardiovascular disease can be provided with a recommendation for a product specific to those risks. It would be a win-win solution to reduce the premium for the customer and the business risk for the insurers.

Insurtech helps insurers use data effectively. With more customer information and a better control of risk, insurers can provide a personalized product and price on the basis of intelligent insurance and intelligent risk management. Intelligent pricing systems can assess a customer's degree of risk through decision and cluster analysis.

For example, in health insurance, the decision-making system could increase the price for older people or lower the price for people who have a healthier lifestyle. After assessing a customer's financial condition and historical behaviors, the price could be increased if they could increase the insurer's risk. Granular intelligent pricing will become more specific and more personalized and will adjust based on statistical analysis in real time.

## Claims Settlement

Insurtech will allow insurers to streamline claims settlement, shorten response time, and improve service quality. For example, image recognition can automatically identify a tampered invoice and read information such as name, item, amount, and number through OCR, which significantly reduces processing time. For vehicle damage claims, insurers can use image recognition to judge the degree of damage and determine the appropriate repair and reimbursement. The whole process can be completed in a few seconds without onsite personnel.

## Fraud Prevention

Fraud is common in the insurance industry, costing millions of dollars in the United States; in the United Kingdom, some estimates place the number of insurance fraud cases at 350 a day. Insurtech algorithms can identify potential fraudulent claims that can then be investigated.

ZhongAn Technology, together with a number of financial institutions, has jointly set up the Financial Anti-Fraud Blockchain Alliance, which shares the calculated data among different financial institutions with secured data and privacy based on blockchain and multi-party computing technologies.

# Future Trends

With the continuous development of internet insurance and insurtech, we can anticipate five major trends in the future:

1. With the introduction of AI, insurance will become simpler and more intelligent. AI will become the digital messenger to connect insurers, customers, brokers, employees, and partners. It will play an important role in technology and customer interfaces.

2. Insurtech will further integrate the businesses and platforms to establish a complete ecosystem. The competitive advantage of an insurer will no longer be solely determined by itself, but will be more dependent on its partner and adopted ecosystem. The ecosystem will have a transformational impact on the insurance industry with its strengths and advantages in various aspects. ZhongAn Technology has cooperated with other insurers, including Evergrande Life, Hengqin Life, and Jixiang Life, to explore new possibilities in the insurance industry from internet platform construction to customer co-operation, and to frontier technology co-exploration, all of which are based on blockchain and other technologies.
3. With the development of insurtech, the resource structure of the insurance industry will change. The traditional insurance company workforce structure will be replaced by a new and open one, with insurtech replacing more freelance positions and fewer opportunities for traditional roles.
4. Insurance product planning will be more customer-oriented, more customer-friendly, and more personalized. Insurers will have a more in-depth understanding of customer behaviors and provide personalized products and pricing strategies to different customers in order to improve client experiences.
5. Based on insurtech, insurers will not only create new products and services but also build new digital industry. Insurtech will have a huge impact on the insurance industry and reshape and redefine the industry's technical standards and rules.

# THE REGTECH START-UP ECO-SYSTEM

Janos Barberis

Predicted to be one of the fastest growing sectors of 2018, the regtech start-up eco-system has expanded rapidly to match that expectation. Regtech entrepreneurs are driven by the US\$100 billion market opportunity that compliance spending represents. This has brought about a market of more than 300 regtech start-ups (compared to 7,000 FinTech start-ups), which is fuelled by a cumulative US\$1 billion investment by venture capitalists since 2012.

To better understand the start-up eco-system let's start with some context. With the United States setting the tempo of global regulatory changes and characterized by fragmentation of supervisory bodies, most compliance spending will occur there. Although the United States represents a strong natural client, the start-up activity is predominantly based in Europe. Asia, as a region, represents one-third of regulatory spending but is underserved, for now, by start-ups, leaving the market to traditional vendors.

The 2008 financial crisis represented a strong catalyst for regulatory changes across the world. The combination of fines (over US\$321 billion), regulatory changes (tripling during the period of 2015-2018), and post-crisis reform implementation (e.g., Dodd-Frank, Basel III) has forced the banks to increase their operating cost as a response to their new regulatory obligations.

To provide a sense of scale, a financial institution like JP Morgan has added 14,000 legal and compliance staff since 2012. It is not unusual for banks to have 20% to 30% of their employees working in compliance-related functioning, meaning that a Tier 1 Universal Bank such as HSBC has more compliance officers and lawyers than Facebook has total employees.

However, the number of recurring fines occurring post-crisis is challenging the effectiveness of simply adding human resources to meet compliance obligations. Indeed, for each US dollar spent on compliance, three are spent on regulatory fines. It seems that the compliance industry has difficulty learning from its mistakes.

A decade has passed since the crisis, and in that time, most of the regulatory changes have been implemented. Financial institutions are now starting to look at how to automate new compliance obligations and decrease the added-recurring cost that has built up post-crisis. Regtech start-ups are answering these demands.

Regtech companies can be classified into three categories, each of which will be illustrated below.

1. Regulatory Compliance: Learn about the effect of regulatory changes on the business logic of a bank
2. Risk Management: Identify conduct risk to prevent another LIBOR scandal
3. Financial Crime: Identify the ultimate beneficiary of a shell company.

Most of the regtech start-ups are concentrated in the regulatory compliance space, reflecting the fact that this represents a low-hanging fruit for success (e.g., data availability, limited integration, and lower risk in case of error).

As with FinTech companies, the majority of regtech companies are B2B providers selling to financial institutions. Although the demand from this client base is strong, it appears that that sales cycle remains long, on average 12 months, on par with what is witnessed in the FinTech industry. Certain exceptions are noted, especially in the context of the upcoming regulatory deadline, such as MiFID II or General Data Protection Regulation (GDPR), which fast-tracks the sales cycle.

Additionally, regtech start-ups can be found in two other areas worth mentioning.

- The first area is regulators. The B2G space is growing. Regulators globally are engaging regtech start-ups via various channels, from hackathons to accelerators, to find solutions to enhance their supervisory or regulatory function. Similarly to financial institutions, regulators are driven by the cost benefits provided by regtech start-ups, which can reach a factor of x10; these savings are especially important when considering the fact that taxpayers' money is used to finance regulators and their operating cost, making for a strong public policy case. Although having a regulator as a client brings legitimacy, the lengthy procurement process is extended by additional tendering rules relative to sourcing suppliers for the public sector.
- The second area is FinTech companies. Certain FinTech companies are directly adding regulatory compliance processes into their products. For example, in the context of the wealth management space, fund products are now being sold and marketed only to prequalified investors by leveraging their data to access suitability, location, and investment profiles. Although for consumers this provides a level of personalization of services, for a financial institution this embeds regulatory compliance into the sales cycles and avoids fines relative to mis-selling—which previously occurred because compliance and sales functions were operating in silos.

## II. AI/BLOCKCHAIN

# ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, AND DEEP LEARNING: A PRIMER\*

Larry Cao, CFA

We are witnessing the beginning of the artificial intelligence (AI) era.

The computer program AlphaGo defeated the world's top player in the complex Chinese board game of Go for the last time in May 2017. The program had run out of human competition. So its developers designed AlphaGo Zero to simply play against itself without the aid of any historical game data. AlphaGo Zero taught itself how to beat all versions of AlphaGo in 40 days.

People have been playing Go for millennia. And yet all the human wisdom accrued during those countless hours of competition across the continents and throughout history turned out to be no rival to an AI program with 40 days to itself.

And AI's footprint is not limited to board games. Its imprint can be seen in countless industries and professions, from finance to medicine to accounting. JPMorgan's COIN program performed 360,000 hours of finance-related work in a few seconds. An AI program at the University of Nottingham can now predict strokes and heart attacks more accurately than doctors. Accounting firms Ernst & Young and PwC are testing drones that use AI in their audit work.

The threat AI poses to white-collar jobs is obvious. But before embarking on an elaborate discussion about whether and how AI will put human investment managers out of business, we first need to define what AI, machine learning, and deep learning are all about.

For the technically initiated, *Deep Learning* by Ian Goodfellow as well as online courses by Andrew Ng at the Massachusetts Institute of Technology (MIT) are all great resources. But what about investment professionals with backgrounds in finance, not linear algebra and computer programming? What do we need to know to understand AI's potential impact on the industry and our careers?

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\* The article was first published on the CFA Institute *Enterprising Investor* blog in February 2018. <https://blogs.cfainstitute.org/investor/2018/02/13/artificial-intelligence-machine-learning-and-deep-learning-in-investment-management-a-primer/?from=timeline&isappinstalled=0>

## What Is Artificial Intelligence?

At a basic level, AI is a branch of computer science that, to paraphrase Bill Gates's mission when starting Microsoft Research, seeks to build computers that can see, hear, and understand humans.

Alan Turing's work to make thinking machines, summarized<sup>7</sup> in "Computer Machinery and Intelligence," was a major milestone in AI's history. In that 1950 paper, Turing asked, "Can machines communicate in natural language in a manner indistinguishable from that of a human being?" This is the essence of the famous Turing Test, which has become a key benchmark for generations of AI researchers in evaluating the power of their programs.

There seems to be general agreement<sup>8</sup> that AI became an independent branch of scientific investigation in 1956, at the Dartmouth Summer Research Project on Artificial Intelligence.

For our purposes, the term AI applies to programs that simulate human cognitive abilities as well as those that process and apply the information captured. Natural language processing (NLP) and speech and image recognition applications are examples of AI. NLP seeks to understand written language texts. Speech recognition—say, turning voices or spoken language into text—is a related field. Image processing is another parallel field and is often referred to as image recognition or computer vision.

As a discipline, AI is fast-evolving and so is its definition. Applications that counted as AI just a few years ago, such as optical character recognition, or OCR, for example, may no longer.

## What Are Machine Learning and Deep Learning?

The quality of machine translation has improved by leaps and bounds in recent months. Recommendations from commercial services, such as Amazon and Netflix, have become ubiquitous. As with AlphaGo and AlphaGo Zero, these developments have all been driven by advances in machine-learning and deep-learning technologies.

So, what are machine learning and deep learning? The term *machine learning* was coined in 1959 by computer scientist Arthur Samuel in reference to "a field of study that gives computers the ability to learn without being explicitly programmed." Machine learning applications are AI programs that can write additional programs themselves to interpret input and predict output.

While machine learning may be a new term that many investment managers have only recently encountered, neural network is a related concept that finance professionals, particularly quants, may be more familiar with. Neural network is a form of machine learning inspired by how human brains process information. Yaser S. Abu-Mostafa of the California Institute of Technology (Caltech) compares that relationship to the one between a plane and a bird.

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<sup>7</sup> <https://academic.oup.com/mind/article/LIX/236/433/986238>

<sup>8</sup> <http://aima.cs.berkeley.edu/>

Deep learning is among the hottest buzz words today. Many claim deep learning's emergence has revitalized AI research. Deep learning is basically multi-layer neural networks: programs that process the initial input in multiple stages to generate the final output, at each stage taking the output of the last stage as the input. It is reminiscent of how we tend to break down complex tasks into a series of smaller steps. Deep learning is one of the many approaches to machine learning.

Together with the increase in computing power and the avalanche of data now available, advances in deep learning techniques have helped bring about the AI spring we are experiencing today.

## Where Are We on the Journey of Building a "Seeing, Hearing, and Understanding" Machine?

AI terminology and methods will continue to evolve. For example, Yann LeCun has recently proposed that the term *differential programming* should replace deep learning. What really matters for investment professionals are the toolkits these innovations have made available to us.

So where does the scorecard stand today? Computers are making strides and may be outpacing us humans.

- In the ImageNet competition of 2017, AI programs beat the best human record by an increased margin, emphasizing that computers can now "see" images better than us.
- In 2017, Google and Microsoft speech recognition programs transcribed as accurately as humans, so computers can now "hear" just as well as us.
- Two AI programs have succeeded in reading better than an average adult as of January 2018, so we can say computers can now "understand" us.
- In January 2018, Google debuted the Cloud AutoML platform that puts the power of machine learning in more programmers' hands. So more machines will be able to see, hear, and understand.

AI technology has made tremendous progress in the last 12 months and many more tools are now at programmers' disposal. The next big push will be applying AI across industries.

In the words of numerous industry heavyweights, AI is the new electricity.

I have no doubt it will light up many bulbs.

# PORTFOLIO MANAGERS, AI IS COMING FOR YOUR JOBS\*

Larry Cao, CFA

Artificial intelligence (AI) is coming to the investment world.

With the help of deep learning techniques, AI researchers have made significant strides in natural language processing (NLP), speech recognition, and image recognition. Computers can now see, hear, and understand human beings. They have also demonstrated shrewd decision making.

What does this mean for investment management professionals?

In December 2017, we invited some of the brightest minds in AI and investing to discuss how AI is transforming the investment business at the AI and the Future of Financial Services Forum in Beijing. Their collective conclusion was nothing short of mindboggling: AI will eventually replace most, if not all, investment managers.

Let's walk through their reasoning step by step.

## Deeper Analysis

By such common standards of intelligence as language skills, mathematical skills, and memory, computers are gaining an edge over humans. That margin will only grow wider over time. Will that edge translate into better investment skills?

"The biggest advantage of a computer [over a human being] is its practically unlimited memory," Eric Chang of Microsoft Research Asia explained. The 152-layer-deep neural network his team at Microsoft developed can tell what's in a picture with more accuracy than humans.

Training such complex models requires a tremendous amount of data, more and more of which has become available in recent years. "Data alone is not enough though," Chang said. "Our focus is on getting insights from the data."

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\* The article was first published on the CFA Institute *Enterprising Investor* blog in March 2018. <https://blogs.cfainstitute.org/investor/2018/03/09/portfolio-managers-artificial-intelligence-is-coming-for-your-jobs/?from=timeline&isappinstalled=0>  
I want to thank the speakers at the AI and the Future of Financial Services Forum, hosted by CFA Institute and CFA Society Beijing, for inspirations

Tang Xiaodong, CFA, CEO of China Asset Management, gave the audience an example of such insight. Investors have used image recognition programs to find oil tankers on satellite imagery. "Some have been able to get a better gauge on oil supply by analyzing the tankers' tonnage, routing, and port arrival times," he said.

Many analysts listen to quarterly conference calls from corporate management to detect clues that they can use to estimate corporate earnings and build valuation models. "With the help of voice recognition programs," Tang said, "they can zoom in on a small number of companies where AI raises a red flag based on changes in management's speech patterns."

Shu Ming of Lingfeng Capital explained how one of their portfolio companies applied AI algorithms to help a bank client evaluate its risk exposure to a potentially problematic borrower: "We used NLP and knowledge maps to go through regulatory filings, legal proceedings, and online information about related transactions, company ownership structures, business transactions, loan guarantees, and key personnel movements to map out corporate relations. The program detected over 800 accounts related to the problematic borrower. The banks originally thought there were four."

## Better Decisions

Chang said that Microsoft applies its image recognition models to understand investor personalities. They can then harvest that data to build more customized portfolios, demonstrating how deep analysis can inform better decisions.

Better investment decisions come, in part, from more precise asset pricing. More-in-depth analysis provides more accurate inputs for valuation models. For example, if the information on oil tankers gives you an edge over your competition in forecasting oil prices, it will also help you better model revenues and costs for oil companies and airlines. If your program succeeds in catching CEOs in their mistruths on conference calls, you'll likely capture alpha by selling those companies when you hold them and avoiding them when you don't. And AI is still capable of accomplishing so much more.

AI's freedom from emotions and behavioral biases should also lead to better investment decisions. Although neural networks operate in different ways than a typical quant model, they share that same lack of emotions. (More on the difference in the next chapter.) And as the saying goes, "The market does not beat them. They beat themselves . . .".

Behavioral biases will continue to influence our investment decisions, often to our detriment. For example, investment managers are often prone to herding, or following the crowd. At the height of the tech bubble, for example, too many investors chased a stock simply because management added a .com to the company name.

But machines won't follow the next machine. Unless we program them to do so.

## The End Game

"To invest successfully over a lifetime . . . what's needed is a sound intellectual framework for making decisions and the ability to keep emotions from corroding that framework," Warren Buffett wrote in his preface to Benjamin Graham's *The Intelligent Investor*, which Buffett described as "the best book about investing ever written."

Given AI's superior brain power and lack of emotions, Tang believes the market will eventually be dominated by a small number of AI programs, maybe even a single one: "If an algorithm eventually beats all the rest, you'll have to either hand over your money for it to manage or withdraw from the market entirely," he said. "You cannot afford to keep losing."

Case in point: The Man Group, a hedge fund, had an AI program manage a small portion of the assets in one of its largest funds.<sup>9</sup> By 2015, the AI accounted for roughly half the profits.

AI also has support in academic circles. Campbell R. Harvey of Duke University believes<sup>10</sup> AI will assume a major role in investment decision making and that the proliferation of AI and big data will result in "15 to 25 investment management superpowers that can harvest all that data."

So the big question is when—not if—AI will supplant human investment managers.

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<sup>9</sup> <https://www.bloomberg.com/news/features/2017-09-27/the-massive-hedge-fund-betting-on-ai>

<sup>10</sup> <https://www.nytimes.com/2018/01/12/business/ai-investing-humans-dominating.html>

# ARTIFICIAL INTELLIGENCE AND THE FUTURE OF INVESTMENT MANAGEMENT\*

Larry Cao, CFA

Not all is lost, investment professionals.

Despite artificial intelligence's (AI's) significant and rapidly increasing "brain" power, the investment management business is not going away tomorrow.

But it is changing, and the current model will one day be rendered obsolete. So what does the road map leading to that eventuality look like? And what's our best strategy in the interim?

## Technological Boundaries

Contrary to conventional wisdom, the data scientists on the panel at the AI and the Future of Financial Services Forum in Beijing in December collectively reassured the investment managers in attendance that AI will not drive them out of business overnight. Why? Because in the words of Eric Chang of Microsoft Research Asia, "There is not yet enough data."

Shu Ming of Lingfeng Capital cited the statistical concept of V-C dimension, which measures the number of rules within a system, to provide some perspective.

Given the biological limits of the human brain, researchers believe that the threshold for an intelligent system to beat human beings at a goal, say playing the ancient board game of Go, is about 10 million rules.

To put all this in a layperson's language: It takes time and effort to write the code and tag the data for the machines to process.

How much time? In the ImageNet image recognition competition, 50,000 people from 167 countries took more than three years to organize and label over 100 million pictures. And investment management may be a more nuanced subject than image recognition.

Moreover, although finance is a data-rich industry, financial markets are not controlled environments and encounter many unanticipated events that AI is not particularly well-suited to navigating.

"[Warren] Buffett can make split-second decisions on complicated M&A deals," Chang said. "AI cannot do that yet."

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\*The article was first published on the CFA Institute *Enterprising Investor* blog in April 2018. <https://blogs.cfainstitute.org/investor/2018/03/29/artificial-intelligence-and-the-future-of-investment-management/?from=timeline&isappinstalled=0>

Neko Chen, the former CTO of Goldman Sachs China, agreed, pointing to instances of market flash crashes and the inability of machines to respond in a timely fashion.

Another practical challenge AI programs face is that they cannot explain themselves. By definition, a deep learning model is a black box. Quants are often blamed when their black boxes misfire, but not because they don't know what's in them. They just choose not to share their trade secrets. Data scientists, on the other hand, may really not know what's in their black boxes.

## Human Hope

A critical point to remember: This is not a race between humans and machines. As Chang put it: The AI plus human intelligence (HI) model holds the most promise. Our competition is not machines. It is the other people plus machine teams out there. We want the smartest machines working for us and our best chance of building them faster is to work with the best in AI.

This supports our May 2016 hypothesis that the optimal way forward for FinTech is likely through the collaboration of powerful financial institutions and powerful technology innovators.

So what can investment professionals today take from all this? We will all yield to AI gradually over an extended period of time. In that process, investors will enjoy the benefit of AI-powered "assisted investing," much like drivers today enjoy "assisted driving" en route to the moment when self-driving cars rule the roads.

What's the road map for AI in investment management? This may be an oversimplification, but I believe (1) portfolio managers will have longer careers than analysts, and (2) investors in liquid markets will enjoy the benefits of AI sooner.

"AI's advantage is in standardized and repetitive tasks," Shu pointed out. In the near future, analysts will likely free themselves from such mundane chores as building basic financial models. Insights, rather than Excel skills, will rule the day.

It will be an iterative process: Analysts will help build intelligent systems to process more information to help analysts generate insights. Analysts will continue to fine-tune the system until it becomes the Siri that can answer all our questions.

The role of a portfolio manager involves more "dimensions," however. Portfolio managers tend to cover more sectors or countries than analysts and make their decisions after considering a variety of "rules" that will take longer to code. Less liquid markets, such as convertible bonds or frontier markets, generally have less data with which to train the neural network models. In other words, our jobs are more secure if we work in the less efficient segments of the market.

But whatever our roles, nobody can afford to be complacent.

"Your destiny is in your hands," Li Hongyu of ZhongAn Technology told the audience. The panelists all agreed. "Continuing professional development is a must even without AI." And obviously, the more we improve our investment skills, the harder it will be and the longer it will take for machines to catch us.

May the best team win!

# ARTIFICIAL INTELLIGENCE: UNLIMITED POSSIBILITY

Eric Chang

*In December 2017, CFA Institute and CFA Society Beijing co-hosted an "Artificial Intelligence and the Future of Financial Services" forum in Beijing. Dr. Eric Chang, vice president of Microsoft Research Asia, gave a keynote address at the forum entitled "Unlimited Possibilities in Artificial Intelligence." The text below is based on transcripts reviewed by Dr. Chang.*

AI is catching everyone's attention. The White House states AI will have a great impact on finance, transportation, education, healthcare, law, and employment in the future in its white paper. AI seems to be penetrating into various industries. For example, the catering and medicine industries are applying AI in their business. Even Japanese cosmetic company Shiseido bought an AI company to start its personalized cosmetic service. For investment professionals, consider not only the job opportunities; you should also concern yourself with the investment targets.

We do believe that AI is in a position where the internet was in the early 1990s. The impact of the internet was felt more in the United States and media industry back then. But right now, every country and industry has been penetrated by the internet. Similarly, AI will have huge impacts on various industries with benefits and opportunities in the future, although it is just at its early stage. The cooperation among the leaders in various industries will push its expansion.

To understand what AI is, we need to first understand what AI can do. AI helps to improve the machine cognition capability. Microsoft has launched two AI-based chatbots: Cortana, which aims to help to improve efficiency and productivity, and Xiaoice for strengthening the emotion connection level. Emotion connection is a crucial factor in the interaction between people and AI-based robots. The number of interactions illustrates the level of emotion connection.

The interaction between Xiaoice and people has increased to 23 times right now from 5 times in the beginning. Sometimes it can even reach hundreds of times, which acts as a real chat between humans. AI helps to bring a more active interaction between people and Xiaoice. Many people have started to chat with Xiaoice and it has expanded into other markets, like India, Japan, the United States, and Indonesia. As a chatbot, Xiaoice also can be used in marketing promotion. Through the interaction between Xiaoice and people, Xiaoice will have a better understanding of the customer so as to make the promotion more personalized and accurate.

Another improvement is in image recognition. Microsoft Research Asia developed a 152-layer of depth neural network which has an accurate image recognition capability. The computer can recognize different elements in one picture, which is better than a human can. With an

unlimited memory, which is its biggest advantage compared to humans with limited memory, an AI-based computer can write down all the features of the world. Not only recognizing the element in the picture, AI also can recognize the boundaries of one picture, and even a video. AI boundary recognition can be applied in the auto-drive car and robot.

AI is at its early stage of data analysis. Ultimately, we expect AI to generate insights other than form data-driven results, which is most crucial.

The next stage for AI is to enhance human capability. The best scenario in the future is machine-assisted mode. Humans are good at learning lessons from similar issues and reacting quickly, but they can't work for 24 hours a day. AI can handle massive amounts of data, but sometimes it can't work in an abnormal situation. The "HI+AI" (human intelligence + artificial intelligence) model will dominate in the future. Machines can handle most tasks and people will replace the machine if it fails. People can teach the machine while it is solving the problem. Therefore, the machine will handle it that next time.

For the finance industry particularly, AI can help financial institutions to complete their digital transformation, including customer service, employee motivation, operation optimization, and product transformation, which poses a great opportunity for the industry.

Based on the information from social media, AI can help to make a judgment on different people's personalities based on the online information. Generally, there are five major personalities: extrovert-, easygoing-, neurotic-, conscientious-, and open-type. We can make a more human-like chatbot with more accurate understanding of human personalities. The results of character analysis can also lead to more personalized investment advice.

At Microsoft, we believe there are three technologies that will have far-reaching implications for the future, which are AI, mixed reality, and quantum computing. AI is more mature at this stage. Although quantum computing is the least mature, it may have a huge impact on the whole economy in the future. Microsoft hopes to apply AI to every aspect of life through close cooperation with partners to benefit the world and society.

# ARTIFICIAL INTELLIGENCE LEADS THE FUTURE OF PERSONALIZED ASSET MANAGEMENT

Tang Xiaodong, CFA

*In December 2017, CFA Institute and CFA Society Beijing co-hosted an "Artificial Intelligence and the Future of Finance" forum in Beijing. Tang Xiaodong, CEO of China Asset Management<sup>11</sup> and vice president of the Asset Management Association of China, gave a keynote speech at the forum. The text below is based on transcripts of the speech.*

Why are we talking about artificial intelligence (AI) right now? The answer is quite straightforward. A huge amount of data has been generated from trading systems and social media networks in the financial industry, and computing capability has been greatly improved at the same time. For example:

1. Ant Financial set up an insurance company that focuses on return shipping insurance based on the data from its e-commerce businesses. The company made profits in its first year, compared to a typical average time of seven years for traditional insurers.
2. As CFOs of listed companies have to communicate with investors on a regular basis, people can figure out whether they are lying by using voice recognition technology. This will help investors filter and narrow down thousands of companies into a small number of companies. Then investors can finally short-list one or two of them. Big data helps us implement strategies that were not feasible before.
3. During an election, experts can estimate the age of a voter by analyzing the make of his car from satellite images based on image recognition technology and thus predict the election result.

AI also brings fund companies many opportunities. First, there are many investment opportunities or targets related to AI in the market. Many new technologies can be used in future business developments. Technologies like visual recognition, voice recognition, biometrics, functional robots, and industrial robots have great potential for development.

Second, there is big data-assisted investment. With the improvement of computing capability, AI and big data can assist fund managers to make better investment decisions. Most people made wrong inflection judgments. One human weakness is that at times [an individual] will be very greedy and then fearful at other times. We expect rational algorithms to reduce irrational prejudices in the investment process.

Specifically, people can make a more accurate assessment of crude oil supply by analyzing oil tankers' satellite pictures, which include information like tonnage, course, and arrival time. It also works for other forward-looking macro data or cyclical indicators, such as corn,

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<sup>11</sup> Tang has since left China AMC.

soybean, and coffee prices. Through the analysis of rainfall changes in the American corn and soybean production area or Brazilian agricultural production area, professionals can predict changes in the supply of agricultural products more quickly and accurately. In addition, there are plenty of similar examples in the social media networks, payment scene, public opinion, and other aspects.

Third, robo-customer service. AI can serve multiple customers at the same time, and the response speed is at the millisecond-level. In addition, it can provide personalized services. Financial institutions can know the client information, including the products he bought, the questions he asked before, and whether he was making or losing money once he called us. Therefore, they can prepare a few answers based on the database. This will solve the problem of young customer service staffs' lack of experience and increase customer retention rates to a large extent.

Fourth, robo-advisor. Through communication with the customer, or cooperation with other leading companies, ChinaAMC hopes to create a digital portrait for each customer first. And then we can provide investment advice at any time, including portfolio restructure through the intelligent asset allocation service and all-day robo-customer service. The company aims to provide personalized solutions to different customers based on their demands and risk preferences.

AI shows great potential in the financial industry. Many large western asset management companies have already deployed similar strategies. We are actually worried that our biggest competitor in the future would be Renaissance, not Fidelity. That's the reason why China Asset Management has started to work with Microsoft as a strategic move in advance.

Although everyone is talking about AI, I think there are some bubbles in the industry in the short term. However, there is still a broad space for AI in the next five to ten years with increasing demands from the Chinese financial industry, massive amounts of data, and high-speed computing capability.

# CHINA'S FINANCIAL INDUSTRY IS MOVING FROM DIGITALIZATION TO INTELLIGENCE

Shu Ming, CFA

*Shu Ming, partner at Lingfeng Capital, was invited to deliver a keynote speech at the "Artificial Intelligence and the Future of Finance" forum co-hosted by CFA Institute and CFA Society Beijing in December 2017. The text below is based on transcripts reviewed by Dr. Shu.*

From the perspective of modern financial history, the financial industry is always evolving with the most advanced technologies. Chinese consumer/cash loans, which have attracted the most attention recently, are the reflection of financial digitization in the contemporary era. Capital One first successfully completed the financial digitalization in the United States. Capital One completed the data digitalization during the PC age without any competitors. It discovered a lot of customers ignored by banks, and since then it has grown up and entered the mainstream of the industry.

From a longer historical dimension, current popular sectors of Chinese consumer finance emerged from the process from digital finance to finance digitalization in the background of the mobile internet's development with social media, finance, and localization. There are many un- and under-served consumers in China, thus resulting in a great growth in this area. Every major change in the financial industry originates from the interactions between financial companies, consumers, and regulators. Finance intellectualization will come after the digitization era.

The concept of finance intellectualization came up very early. In my opinion, the current application of AI in the financial industry is intellectualization of the financial system to a large extent, which is the next stage of digitalization. When will intelligent systems replace financial practitioners' positions? Refer to the concept of VC dimension in statistics; all intelligent systems have their own VC dimension in theory. In current deep learning, the VC dimension of one intelligent system can reach more than 10 million, which overtakes most human experts in the field. Although the human brain has roughly around 10 billion cells, the usage of a smart brain just approaches around 10% of its total capacity, which is quite remarkable. An expert can only use a part of his brain and the brain can't be summoned at any time.

AI has many applications in the credit area. For example, there is one company that uses knowledge maps and voice recognition to detect the relevance of corporate credit. First, in addition to data from CSRC (China Securities Regulatory Commission), the system processes more data from the internet to discover relationships between the relevant enterprises and the court, businesses relationships, guarantees, equity structure relationships between enterprises, and relationships and flows among the enterprise core staff, thus building the relationship map among different enterprises.

Enterprises in a relationship map may appear to have no equity or guaranteed relationship with each other, but the system can discover their relationships through the relevance of several shareholders. When there is a significant change in one enterprise's equity, or one enterprise is involved in a lawsuit, it will have a potential impact on all parties involved in the network. The system will re-evaluate the credit risk of each enterprise. If one enterprise is close to the risk threshold, the system will send the alert to the relevant credit manager in the bank.

Many enterprises have complex structures and contain many affiliated companies in different places. The credit relationship of one enterprise is often rooted in different sub-branches of one bank. It is very challenging for a bank to assess the overall impact of a multi-subsidiary enterprise. For example, a very important state-owned policy bank originally thought that the credit relationship of a large group was only concentrated in three or four accounts. But it turned out that its affiliates were found to have an impact on more than 800 accounts in the bank system after the test. Through that, we can see that the knowledge map, as a tool in the AI field, can play an important role in improving the bank risk control system.

In the insurance industry, a FinTech start-up provides AI-based chatbots for insurance companies to help consumers identify their own needs and the right type of insurance effectively. This company concentrates on insurances like critical illness insurance, accident insurance, life insurance, and annuity insurance, which have relatively strong non-standard characteristics. Different people will have different diseases or potential risks. On the other hand, the pricing of such insurance is not very transparent. Millennials are increasingly concerned with their health protections, but many of them do not know how to choose the right product. The chatbot can help these consumers to determine their needs and the right products effectively. Besides, it can help insurance companies improve the customer service experience (customers can interact with the chatbot at any time) and has already become a new sales channel. The conversion rate of chatbots is higher than the average level of telephone sales.

Lingfeng Capital is evaluating a start-up that assesses clients' risk tolerance and trading style by AI. The information obtained through the Know Your Customer (KYC) process often does not match with the client's real investment capability and style. By using Hang Seng trading data, this company assesses its client's risk tolerance and trading style based on his real performance in real transactions, including his timing and ability to cope with market volatility. It helps financial institutions re-communicate with the client and allocate his investments more effectively. It is believed to have a positive impact on the retail investment industry.

In the payment area, as a large amount of data are generated naturally, AI and big data are first applied in anti-fraud. For example, AI-based applications can check not only passwords but also the behavior of entering passwords, including the time interval between each keystroke in the password input process. And it is also possible to find out whether the location where a user enters the password is where he frequently appears. These applications benefited from the experiences of many fraud cases.

In the end, AI will be widely used in financial regulation, which tends to lag technology development. Data-based AI will make real-time supervision available in financial regulation and improve the efficiency and accuracy of regulation. It is believed that AI will be applied in multiple scenarios in the financial industry to benefit hundreds of millions of Chinese financial consumers and promote the efficiency of financial companies and regulators, which will create a healthy financial market in China.

# BLOCKCHAIN APPLICATION IN FINANCIAL SERVICES

Zhang Beilong

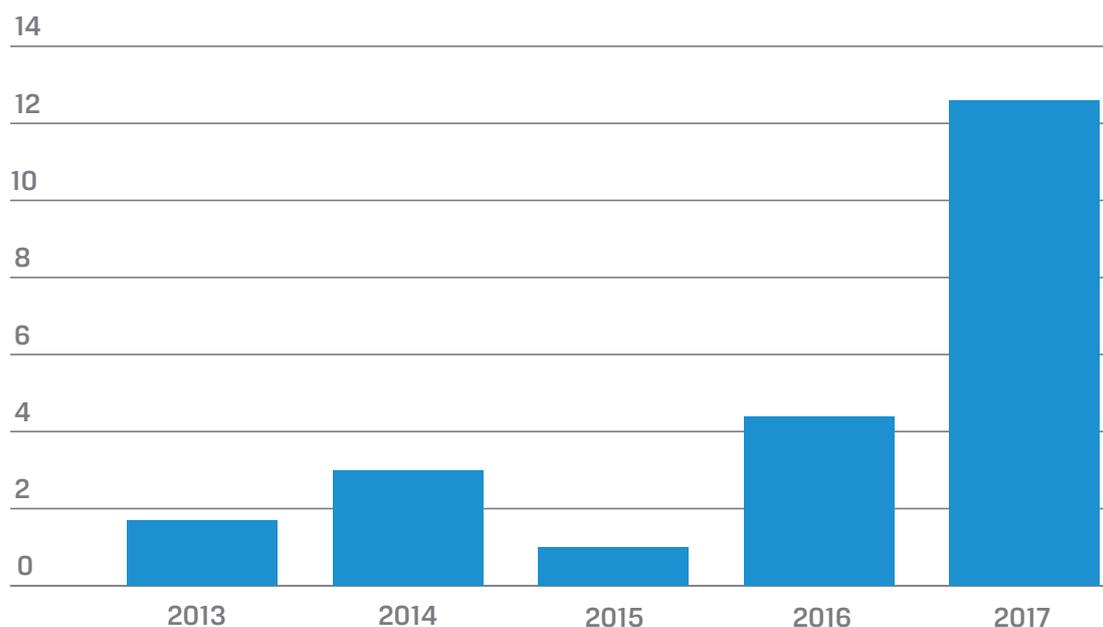
Blockchain has experienced rapid growth in the past year. Some financial institutions began to incorporate blockchain into their strategic development plans and apply blockchain to push business innovation. At present, China has established nearly 20 blockchain industry associations and alliances, such as the blockchain payment application research group of the Payment & Clearing Association of China, China Ledger, Fisco, etc. Many industries have implemented blockchain, including financial services, health care, manufacturing, government affairs, philanthropy, retail, real estate, transportation, tourism, and the media, but most of the applications are still in the proof-of-concept stage. It is still impossible for companies to get benefits from blockchain. There is still a long way to mature commercial implementation.

Baidu, Alibaba, Tencent, and other Chinese internet giants have launched online blockchain platforms and projects. Blockchain investments from venture capital have increased gradually in China in recent years. According to public statistics, domestic blockchain investment projects reached 54 in 2017, with a total amount of more than 1.2 billion yuan (see Figure 2.1).

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**Figure 2.1 Funding for Blockchain Projects in China (VC)**

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Blockchain has potential application in three areas of financial services. First is the traditional area with multi-parties and the use of obsolete processes, such as in billing underwriting and letters of credit, areas in which transactions are still manually processed. Blockchain can greatly improve the efficiency of these businesses. The second area is the field involving common management, transmission, and application of data by multiple parties. For example, blockchain can act as a trust medium in supply chain finance, where all involved parties have a strong demand for reliable data sharing and authentication. Third, it is impossible to establish a centralized information system domestically and externally in some businesses, such as the cross-border renminbi business. The distributed accounting mechanism of blockchain can reduce the complexity and cost to push its development.

Blockchain is still in the early experimental stage and has many problems. First, it is difficult to establish a balance among the scale, performance, and fault tolerance of the consensus algorithm, which is one of the core technologies of blockchain. Second, it is difficult to guarantee consistency between the data into and out of the blockchain. Blockchain applications in the finance industry cannot cover all stages of the life cycle of a financial product. Data in the blockchain may not be consistent with the data out of the blockchain. Third, blockchain applications lack unified technology and application evaluation standards. At present, no consensus evaluation standard exists for blockchain applications, which to some extent hinders its development.

Chinese financial institutions continue to explore blockchain possibilities in the fields of business process, business rules, and operation and carry out pilot projects in subdivision areas. Some pilot projects have been implemented in real businesses; these have focused on business scenarios with low requirements for real-time and performance, such as the digital bill trade, payment clearance, digital depository receipts, letter of credit transactions, and so on.

### **Digital Bill Trade**

Blockchain can reduce the multiple selling problem of paper bill and synchronization of digital bills to some extent, accomplish the whole cycle management of bill assets, and reduce the risk of bill circulation.

### **Payment Clearing**

Financial institutions can use blockchain to optimize their payment, clearing, and settlement processes, which can reduce the complexity and cost of cross-bank and cross-border transactions, ensure the transparency and non-tampering of transaction records, and reduce operational risk.

### **Digital Depository Receipts**

Traditional digital depository receipts currently can be stored, traced, and verified through a third-party organizational centralized structure. It is risky to over-depend on such third-party organizations. Blockchain-based digital depository receipts can prevent the receipts from being tampered with or deleted under the centralized structure.

### **Letter-of-Credit Transaction**

The blockchain-based letter-of-credit system can improve the efficiency of issuance, notification, and review processes through its synchronization mechanism, which makes the business processes more transparent and traceable with lower cost than the traditional system.

### **Supply Chain Finance**

The blockchain-based application can connect the core enterprises, multi-level suppliers, factoring companies, banks, and other related institutions in the supply chain. It can construct a trust transmission mechanism through the on-chain record of the whole life cycle of assets and digitize financial assets that are unbreakable in the traditional way, such as bills, to enhance asset liquidity.

### **Asset Securitization (ABS)**

Blockchain can establish a fast and accurate information exchange channel among financial institutions involved in asset securitization to create penetrating management of underlying assets. It can drive the implementation of ABS through smart contracts.

# BLOCKCHAIN: A PROGRESS REPORT

Larry Cao, CFA

Much of the FinTech world believes that blockchain technology will revolutionize how the financial services industry operates. Of course, some of the current iterations of the technology—bitcoin, among them—are criticized for their slow speed and high energy consumption. These qualities would seem to make the prospect of blockchain shaping the future of finance far from inevitable.

Blockchain supporters, on the other hand, maintain that the technology is still in its infancy, that its shortcoming will be addressed, and that it's just a matter of time before one of its applications takes hold and has a truly transformative impact. Carl Wegner, who serves as managing director and head of Asia for the blockchain technology developer R3, recently spoke with us about the progress he and his firm have made as well as where he anticipates blockchain heading in both the near and far term.

## **Larry Cao, CFA: Tell us about R3 and your work in the blockchain area.**

**Carl Wegner:** R3 started out in 2015 as a consortium of 42 institutions. It has now grown to a network of more than 200 financial institutions, regulators, and technology companies, all working together to explore and develop blockchain technology for businesses.

We just completed our funding round last year and more than 40 member banks and technology companies have invested in us. Our board structure is very global with one third of our revenue and investment stream flowing from Asia, one third from Europe, and one third from the USA. It is easy to say that R3 is one of the biggest global blockchain initiatives and we are working on several central bank digital currency projects with regulators in Canada, Singapore, Hong Kong, and Thailand.

We started out doing projects where each would have five to 10 financial institutions working on a specific area to learn about blockchain technology. These areas include insurance, trade finance, payments, digital assets, Know Your Customer (KYC), etc. As we went through the process, we realized that while blockchain has tremendous potential in the unpermissioned world, financial services requires a permissioned blockchain. Hence, we built Corda, a permissioned blockchain platform on which technology providers are building solutions for different areas.

When we do a project, very often half of the people involved are from the technical side and the other half are business people. We have quite a few members leveraging this education to future-proof their IT decisions and investments. It is also valuable for the business people to understand how this new technology is going to change their use of data and how to deal with KYC and customer privacy in the future.

As a global blockchain initiative, we continue to work on educating and working with our partners who are building on our platform while helping central banks and regulators learn about the challenges and opportunities with this new technology.

**You listed a number of areas where you see applications being developed. Could you highlight some that are really promising?**

Blockchain in trade finance is looking extremely promising. In the last month, we had ING and HSBC talking about a trade finance deal they did with Cargill. They completed a live trade finance transaction using Corda that involved a bulk shipment of soybeans from Argentina, through Geneva's trading arm of Cargill, to Malaysia, through Cargill's Singapore subsidiary as the purchaser. A letter of credit was issued using Corda by HSBC to ING.

Conventional exchanges for paper-based documentation related to letters of credit usually take between 5 to 10 days. This exchange was done in 24 hours.

**What was the timeline for these projects?**

These are three-month projects dubbed incubator projects, which eventually go into a commercial product, and we have several ongoing. Marco Polo recently announced an open account trade finance platform that started out as a pilot. There was also an announcement recently from Guardtime and Ernst & Young about building their pilot for marine insurance based on Corda. We also have a company that is trading physical gold in Canada with the regulator's approval.

There is quite a lot of stuff going on. However, it takes baby steps to change financial infrastructure. Anything built now has to work with legacy systems for the next couple of years as more and more functionalities are built. Savings in terms of reconciliation and database costs are going to be incredible.

**Can you elaborate on blockchain's cost advantage?**

For example, I understand that Deutsche Bank globally has over 14,000 platforms with APIs [application programming interfaces] built among them. It has been estimated that in general, about 15% to 20% of the bank's costs go to their IT budget. How much of that goes to regulatory reporting? If a regulator had a node on the blockchain along with whomever they are regulating, you would not have to do another regulator report again. The regulators would have a window to see what they are allowed to see in real time. They would be more efficient as well because they would not have to sort through massive amounts of data.

**What makes blockchain particularly suitable for such tasks?**

Blockchain is a distributed ledger. A blockchain or a distributed ledger is valuable when you have different databases for regulatory, national border, and commercial reasons that cannot be shared. For example, in Taiwan, you would have a health card, which is a chip card. It has your medical history on it. When you go to the doctor and they prescribe you your medicine, you then go to a central counter to take a number to pay your fee. It will be a fairly inexpensive because you

are co-paying only your portion. Then you would wait in line and pick up your medicine when your number comes up on a screen. The reason why you have all these steps is because there are different databases managing this information. If those databases could overlap, then instead of having to put an invoice in for you to make a payment, it will automatically debit your bank account for \$6 and take the \$34 from the insurance company to be paid directly to the hospital. It is all in one ledger. It would know your phone number. Therefore, it will just SMS you that the medicine is ready when the database from the hospital indicates the medicine is ready for pickup. The AIA insurance company, a member of ours, said that potentially up to 75% of their back-office costs could go away by not having to re-key in data or to have paper-managed information keyed into separate databases.

### **Does the data need to be replicated to establish trust on blockchain?**

Blockchain traditionally offers a type of consensus mechanism where you broadcast information out to the world and no one can lie because you tell everyone what you did. When we built Corda we recognized that this model doesn't work for financial services because, for one, it is not possible to have HSBC be aware of every transaction that JPMorgan and Citibank does daily. Secondly, if you had a database that included every bank globally, there would be over 11,000 banks sharing data. If every bank had to maintain a database that contained every other bank's data, it would be immense. That is one of the reasons that traditional broadcasting blockchain does not work for financial services. It would be too expensive to maintain, unwieldy, and too slow for high-speed FX transactions, for instance, as 50% of the banks would have to approve every transaction before it was completed.

Corda is actually a system where consensus is done on a peer-to-peer basis, where only members of the transaction get to see it. It is much quicker if you do not have to distribute it out to 11,000-plus financial institution users. It is a permissioned network.

### **How is data verified on a permissioned network?**

With Corda, we have what we call a configurable consensus. In our system, consensus is configurable based on the security needed in the transaction. An intra-branch payment does not need as many parties contacted as for a cross-border FX transaction. Thus, it can be configured to what the entities find acceptable and what the regulators are comfortable with. Since the information is shared in a smaller group, it also moves much faster.

Think about reconciliation. HSBC buys a stock that Citi sells. It takes T+2 because both of them have the data in their database but the custodian bank has to go double-check with each one of them. With a shared database, they would be looking at the same data so there is no need for reconciliation. Whichever party started the transaction is entering their part of the transaction. They do not have to duplicate the information because they are looking at the same thing. The verification of that transaction comes from using the same database. They could use what is called a notary, which is a verification engine. It could be hardware, software, or even a third party like a regulator. You do not have to use a broadcast network to all banks globally for every transaction. There would be at most four to five entities touching each transaction: two banks, a notary group, and a regulator.

### **Blockchain is often criticized for its speed, energy consumption, and consensus mechanism. Your thoughts?**

Public blockchain is one way of verifying data by broadcasting it out to everyone. If you have to broadcast to everyone – say, 50% of the participants – 2,500 of the 5,000 blockchain miners have to verify it. That is going to be too slow for FX transactions. As I mentioned before, the costs for maintaining the same database for the whole global banking system will also be exorbitant. It just does not make sense. Private blockchain is a way of sharing databases for mutualization of costs and speed.

This also seems to resolve the business system issue, but there is always a concern that you need to sign everyone up for trade finance to, for example, make the system work. It is impossible to have everyone sign up from the beginning. As you expand, the hurdle is high because people use different systems and they have low incentives to switch.

You cannot have a perfect storm with everyone joining at once. A technology decision we made in Corda is to build in interoperability between solutions. If someone builds an open account trade finance application, they might just focus on that. There will be others focusing on FX transaction, KYC, and other components that a bank needs to fully service a trade transaction. Any components built on the Corda platform will be able to interact directly and therefore the value of the sum of the components will bring the extensive benefits to automating trade finance. This will not be able to happen at once, but it's a process that is already happening on Corda as we see the trade finance ecosystem services growing and more services being added monthly.

**Thanks so much for sharing your work with us.**

*Ru Ng contributed to the compilation of this interview note.*

# III. Markets

# Australia

# ALTERNATIVE LENDING TAKES THE LEAD IN AUSTRALIA'S FINTECH BUSINESS

## An Interview with Danielle Szetho and Sarah Worboys

Larry Cao, CFA (interviewer)<sup>12</sup>

### How about alternative lending development in Australia?

**Danielle Szetho**<sup>13</sup>: Alternative lending is the most active area in Australia's FinTech landscape. Actually, Australia is the second largest alternative lending market in the Asia Pacific. Australia's alternative lending market is over \$600 million. Besides, the growth of alternative lending in Australia is much stronger than in other countries in the region, like Japan and Korea.

**Sarah Worboys**<sup>14</sup>: For example, one type of alternative lending in Australia is invoice lending. The FinTech start-ups create online marketplaces for SMEs [small and medium-size enterprises] to sell their invoices to investors. Once investors decide to buy the invoice, the borrower can receive the money in 24 hours.

### Who are the borrowers in the market?

**Danielle Szetho**: The majority are small and medium-sized enterprises—SMEs—and retail consumers. Seventy percent of the alternative lending business is direct to the SMEs. Demands of SMEs and consumers are quite strong. There are several major players in Australia, like Ratesetter, SocietyOne, and MoneyPlace.

### Why does the borrower prefer alternative lenders to banks?

**Danielle Szetho**: It is more to do with the supply and demand dynamics in the market. Although Australia has many small banks, the lending business is mainly controlled by the major four banks. It is a less competitive market. Major banks are very selective when they issue loans. Their risk tolerances are really high compared to other alternative lenders. SMEs and retail consumers can't meet the requirement of the bank. In addition, the bank's pricing model will also not allow a high default rate, which makes it ignore the SMEs and retail consumers.

**Sarah Worboys**: With the constraints from banks, SMEs couldn't borrow certain amounts of capital from banks to support a rapid business growth. Moreover, it will cost more for banks to lend to SMEs and retail consumers.

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<sup>12</sup> Oscar Tai contributed to this article.

<sup>13</sup> CEO of FinTech Australia when interviewed in December 2017.

<sup>14</sup> Interim CEO of FinTech Australia.

### Who are the lenders in the alternative lending market?

**Sarah Worboys:** Primarily, lenders come from the high-net-worth individuals, family offices, wealth management super[annuation] funds, and any retail lenders who can afford the high compliance cost.

### Is there any progress in the risk model from the start-up side?

**Sarah Worboys:** The risk model is a key part of the lending business and is always evolving. The alternative lending start-ups are pushing banks and large financial institutions to open data and related information for improving the risk and credit-scoring model.

### How does the alternative lender control the default rate?

**Danielle Szetho:** Australia has a strong data capability. Lenders can do everything with the data they get. That is one reason why SME lending is taking off with such a great speed. The availability of data through an accounting product like Xero makes that so acceptable. It is a real revolution in Australia's lending market. The lenders who target the consumers are getting more personal information and data than before. For example, SocietyOne is working with one of Australia's credit bureaus to launch a credit data platform for free. People will have a chance to access their credit data. They may be willing to fix their credit data if they find a problem. So they will provide more personal information voluntarily than before. Enriched data will help the lenders to know their clients better and manage the risk of default.

### What about the development of robo-advice in Australia?

**Sarah Worboys:** Super[annuation] funds show an increasing interest in robo-advice and some have already deployed strategies within their funds. The model of robo-advice in Australia is evolving. We see a few players in the robo-advice area, like Spaceship, which is run by a start-up superannuation.

# IS MICRO-INVESTING WHAT WORKS FOR ROBO-ADVICE IN AUSTRALIA?

## An Interview with George Lucas

Larry Cao, CFA (interviewer)<sup>15</sup>

For FinTech entrepreneurs looking to enter the robo-advice business, Australia seems to be a good news/bad news scenario. The good news is the country's aging but affluent population both has money to invest and is relatively sophisticated in the sense that they are open to the idea of asset allocation—seemingly a target-rich environment for robo-advisors. The bad news is, however, most of that money is already in the various superannuation programs. In other words, the savers are not really unserved or underserved by the financial institutions.

Larry Cao, CFA, recently spoke with George Lucas, CEO of Acorns Australia, a micro-investing firm, to discuss Acorns' business model. Its online platform offers services similar to those of robo-advisors but to a distinctly different audience. Will this be the model for robo-advice in Australia? Below is a summary of the conversation.

### What type of service do you provide? What is your motivation?

**George Lucas:** The motivation for Acorns Australia is removing all the barriers in the wealth management industry. For example, a client may need \$10,000 or \$15,000 to open an investment account in a large financial institution with complicated application processes and background checks. Acorns Australia is trying to remove those barriers.

Acorns Australia is a micro-investing platform, or a robo-advisor in some way. It has 660,000 downloads to date, which is 3% of Australia's population, and 150,000 plus active users. Compared to large financial institutions, the client only needs \$5 to open an account and will have six portfolios to choose from.

Low cost of client acquisition allows Acorns Australia to provide low-cost services.

For the traditional wealth management companies, an advisor may need \$2000 or \$3000 to acquire a client. According to a Morgan Stanley report, the average cost of robo-advice to acquire a client online is from \$500 to \$1000. But the client acquisition cost for Acorns Australia is only around \$10.

### Customer acquisition cost is a major hurdle for most robo-advisors. How do you manage to lower that cost? What's your client profile and how do you reach them?

70% of our clients are under 35 and 90% are under 45. Besides, 60% of our clients are male. Our main promotion strategy focuses on the social media platforms, like YouTube, Facebook, and Google products. These companies provide a more efficient way to target the client.

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<sup>15</sup> Oscar Tai contributed to this article.

At this moment, almost all the clients come from the social media channel. They download the app after seeing the promotion video online. Sometimes, new clients come to sign up as they take the recommendations from their friends.

The online distribution strategy lowers client acquisition costs. Besides, there are few robo-advisors in Australia and the competition is not that fierce. Last but not least, we just need 5 minutes to finish the entire process, including AML [anti-money laundering] and background checks when a client opens up an account on our platform, which improves the user experience compared to traditional players.

### **With your low balance requirements for opening an account, how do you grow AUM and revenue?**

Our business model is subscription-fee based. The client pays \$1.25 a month. The client can pour into the account or withdraw their money without any limits or penalties. It makes Acorns Australia look like a more transactional platform than a [typical robo-advisor]. On average, we see \$2 coming in with \$1 being withdrawn.

The AUM is growing. Acorns had AU\$140 million under management at the end of December 2017, and AU\$170 million now. The average account is only about AU\$1,100.

We are expanding into the superannuation area, which is mandated by the government. Every Australian must . . . [place] a part of his salary into its superannuation fund. The average salary in Australia is quite high. For example, a 25-year-old Australian who works straight out of university can earn \$50,000 in his first year, \$60,000 in the second year, and \$60,000 to \$70,000 in the third year. According to the government rules, he needs to pour around \$18,000 into the superannuation in those three years, which is quite a lot of money. If only 5,000 clients invested their superannuation with us, our AUM would increase by another \$100 million. The superannuation market has a huge potential.

We are hitting the break-even point at this moment. We are in process of expanding our product line. Business operation and product development including legal/compliance service fees are the main costs.

### **Where do you invest your money?**

We have six portfolios using a combination of nine ETFs [exchange-traded funds] for investments. Some portfolios are more aggressive and heavily invest in equities. Some other portfolios are more conservative and mainly invest in bonds and cash. Our ETFs invest in government bonds, corporate bonds, S&P 500 Index tracker, European stock tracker, etc.

They are global portfolios but we do invest with a bias towards the domestic market. Australia's fixed income market is doing well with an attractive return. Money market funds are earning 2–2.5% returns. The government bond is not very far behind.

In addition, different portfolios have different exposures to equities. The aggressive portfolio can invest up to 80% in equities and the conservative one only 30%.

### **What are the challenges that Acorns Australia is faced with now?**

We see competition from other robo-advisors and online brokerage and advice platforms. There are only a handful of robo-advisors in Australia compared to the United States or United Kingdom, besides Acorns Australia.

On the other hand, online brokerage platforms from the incumbents are offering simple structure portfolio recommendations. Commonwealth Bank of Australia is dominating this area. Australia is different from other countries. The United States has Wealthfront and Vanguard Financial Advisor services. The robo-advisors in Australia are much smaller and many have B2B models. Vanguard has launched several ETFs in Australia, but still heavily relies on the financial advisors' advice. Most financial advisors come from the four major banks and AMP (which I believe controls 30% of the market).

# THE IN-HOUSE ALTERNATIVE TO FINTECH: THE NAB CASE

## An Interview with Lee Hatton, CEO of UBank Larry Cao, CFA (interviewer)

*There are generally three different paths to FinTech development: FinTech start-ups going it alone, financial institutions collaborating with technology innovators, or financial institutions building technology in-house. Although we believe the second path will likely dominate in the future, there will be winners from alternative paths.*

*UBank provides an excellent example of the last path. It is a digital-only bank set up by National Australia Bank, or NAB, one of the dominant "traditional" commercial banks in Australia. CFA Institute recently spoke with Lee Hatton, CEO of UBank, about their story.*

### **What impact do you think FinTech has had on banking?**

**Lee Hatton:** FinTech start-ups have opened up the banking industry to new opportunities.

This is particularly important as the increasing [adoption] of internet and smartphones is changing customer behaviors. FinTechs are uniquely able to find a customer pain point and solve it—quickly. And this is putting pressure on incumbents to be more customer focused.

### **What are the differences and the advantages of UBank compared to the traditional commercial bank?**

UBank provides a different value proposition to customers. Traditional commercial banks, like NAB, tend to be full-service banks that have physical branches. UBank only provides digital banking services so our customers can serve themselves online.

At UBank we have simple products, so we can be more agile, and react to customer experiences more rapidly.

### **Is UBank's customer profile different from the traditional commercial bank's?**

Yes, around 50 % of our customers are millennials. The one common trait all of our customers share is they want to be in control of their finances, and banking with UBank gives them that control. They are also more digital savvy and enjoy the flexibility of managing their finances online.

### **Can you elaborate on what you offer?**

We have a simple product portfolio with just seven products. We wanted to take the complexity out of banking, so we try to be simpler, better, and smarter for our customers.

### **Is there friction between UBank and the traditional commercial banks?**

Absolutely, because we're challenging the status quo. Many of the big banks have seen the success of FinTechs and models like UBank and are investing in their own challengers or partnering with FinTechs in order to play in this space.

NAB was ahead of the game when it set up UBank in 2008. The reason why NAB set up UBank is that we want to disrupt before we're disrupted. UBank brings a unique culture to our group and can deliver at pace to accelerate the transformation process. In return, what UBank achieves benefits the broader group.

### **How do you apply AI in your business?**

In 2017, we launched RoboChat last year in collaboration with IBM, which took us 6 weeks to implement. RoboChat is a chatbot who can answer buyers' home loan-related questions. The motivation was that we found it challenging for people to apply for a home loan. It has already answered 22,000 questions since launch, significantly improving the home loan experience for our customers.

We've also just launched our next AI-based application called RoboBrain, also teaming with IBM. RoboBrain is a chatbot solution which allows our advisors to type in a question and receive an answer to the question within 2 to 4 seconds.

RoboBrain was developed to address a key challenge—advisors often need to reference a range of data sources when assisting a customer. To simplify this, we created RoboBrain to bring together a single entry point for all of the information advisors may need to support customers. The introduction of RoboBrain has reduced the overall chat length by 60 seconds. If you multiply that by about 1,000 calls a day, in the course of a year, that's 365,000 minutes or more than 6,000 hours of time we've saved our customers and advisors.

These are just two examples of how we've applied AI to our business, with many more exciting updates to follow.

### **How do you work with IBM?**

We create project teams. Often that's just half a dozen people coming together to tackle a business problem. We often use a hackathon format to kick off the ideation process and then quickly move into execution. We've committed to delivering things quickly in our partnership, so we can often have something in market within weeks of the first session.

### **What makes financial institutions successful in FinTech development?**

Partnership makes great sense for FinTech development in the financial industry, like our collaboration with IBM. As a financial institution, you need to have a thorough understanding of your technology partner's evolution process and capability and leverage those skills to present the best product or service to the customer.

### **What might be the challenge for FinTech development?**

Most FinTech opportunities focus on the client acquisition and data areas. The regulation [and] compliance issues are a significant barrier for FinTech development in the financial industry. The regulations and mindset of regulators didn't keep pace with FinTech development. So for the early birds, they were really considering taking a banking license.

# China

# TECHNOLOGY OPTIONS FOR CHINA'S SMALL AND MEDIUM BANKS

## Ping An Bank

FinTech started in the United States. Ten years ago, American technology giants began to map out their own financial business, with payments first. Taking GAFA (Google, Apple, Facebook, Amazon) as an example: Amazon was first to launch Amazon payments in 2007. Google launched its Google Wallet in 2011. Apple launched Apple Pay in 2014. In 2015, Facebook launched Messenger Payments. GAFA all have their own mobile payment apps.

The pace of GAFA in other financial sectors has been slightly slower than in the payment sector. In the lending area, only Amazon launched a loan service, Amazon Lending, for small and medium-sized customers in 2012. In addition to the well-known internet giants, a large number of small- and medium-sized technology companies have begun to penetrate the financial industry.

Although the development of internet technology in China basically follows that of the United States, due to the huge number of internet users in China and the user habits cultivated by e-commerce, the development of FinTech in China has gradually caught up with the United States and started to lead the world. In addition, Chinese technology companies have also begun to go worldwide. Alipay has entered more than 120,000 offline stores in 26 overseas countries, and WeChat Pay has launched its service in 13 overseas countries and regions, covering more than 130,000 offline stores.

## FinTech Helps Banks Change Their Roles

The essential difference between FinTech and the technology used by traditional financial institutions lies in the purpose and intention of using technology, but not in the specific technology or the applied method.

In the past, banks built IT systems for their own needs, mainly focusing on accounting, internal audit, risk management, and compliance. The main target of service was customers, tellers, account managers, other internal staff, and regulatory authorities. Note that the customer was only a *part* of the consideration when the bank planned its IT systems.

At present, the top priority of FinTech companies *is* the customer. The goal of FinTech is to identify and meet the needs of the customer, as well as to enhance the customer experience. The core of technology is transferred from the bank to the customer, which is the essential difference between traditional banking technology and FinTech.

The Chinese banking industry is transitioning from a self-centered role to a collaborative role. Since 2017, five big state-owned banks have teamed up with tech giants: ICBC with JD.com;

Agricultural Bank of China with Baidu; Bank of China with Tencent; China Construction Bank with Alibaba; and Bank of Communications with Suning. The cooperation between these big five banks and the internet giants is expanding into multiple areas.

This cooperation reflects the reality that traditional financial giants and technology enterprises have reached a consensus on the development of FinTech; that is, financial business and FinTech development are becoming more and more inseparable. As well, the relationship between banks and technology enterprises is no longer disruptive or confrontational: each side has its own advantages and supplements the other. The expectation is that cooperation will continue to grow in the future. The Chinese financial industry is expected to enter a new phase of cooperation rather than competition.

Currently, the financial industry focuses on artificial intelligence, blockchain, cloud computing, big data, and biometrics. The major financial institutions hope to expand their business in the fields of mobile payment, wealth management, insurance, small- and medium-sized financial services, and investment management with the help of the development of FinTech.

## FinTech in the Small- and Medium-Sized Bank

Compared to the powerful state-owned banks, most Chinese small- and medium-sized banks, which include urban commercial banks, rural commercial banks, village banks, and private banks, generally have problems arising from limited assets, business coverage constraints, weak risk management, etc. The application of FinTech can help these banks improve their core business capabilities, business efficiency, and user experience, and reduce their risk and cost. It is a better way for small- and medium-sized banks to solve their own problems and have better development.

According to one survey, in the face of rising FinTech, small- and medium-sized banks believe that the biggest threat to their futures lies in changes to their customer foundation:

1. Banks are losing their connection to customers and data, disintermediated by third parties (84%).
2. Customers' demand for better service and experience is constantly rising (76%).
3. Banks are losing their customer base, especially the young generation.

These are the top three threats that small- and medium-sized banks are most concerned about with FinTech.

On the other hand, small- and medium-sized banks generally appreciate the value of big data, mobile internet, and artificial intelligence. The advent of biometrics is also widely recognized for its comprehensive use and clear scenarios. Small- and medium-sized banks have shown less interest in other new technologies under development, such as blockchain and the internet of things, which have fewer application scenarios. These banks are taking a wait-and-see attitude to cloud computing. However, big data can help banks in precise marketing and risk management; mobile internet technology can support offline business mobility; and artificial intelligence can reduce bank costs and improve efficiency.

The development of FinTech is changing the business model of traditional financial institutions gradually. Some small- and medium-sized banks have carried out beneficial exploration and practice on FinTech and have had some brilliant achievements. But more data and time are needed to justify those achievements. For various reasons, there are some difficulties in FinTech development for small- and medium-sized banks, but FinTech has undoubtedly brought about a strong impetus for these banks to break the bottleneck of development.

# HOW THE ABCD OF FINTECH IS CHANGING FINANCIAL SERVICES IN CHINA

Larry Cao, CFA

China is emerging as the world's FinTech market leader. I recently interviewed Ming Shu, partner at Lingfeng Capital and former chief strategist of Ant Financial, for the CFA Institute "Take Fifteen" webcast series. We talked about the most recent FinTech developments in China, focusing on what is referred to as the ABCD of FinTech—artificial intelligence, blockchain, cloud computing, and big data.

Ming Shu believes that recent developments in artificial intelligence are closely coupled with those of data technology; both are different sides of the same coin. AI only works well if there is enough data to draw upon.

Certainly, this is a worldwide trend, as the adoption of AI is increasing in areas where a vast amount of data processing is required to make decisions. AI also enables personalized financial products and services such as insurance underwriting, ewallets, and customized investment research and management.

AI, specifically machine learning or different branches of machine learning such as deep learning and transfer learning, is enabling areas such as credit analysis and fraud detection, which are critical for wealth management decisions.

Ming Shu believes that growth in cloud computing is exemplified by companies such as AWS and Tencent in China. They are successfully attracting a raft of younger companies that want to be part of their cloud platforms for two reasons—first, from a computing resources perspective and, second, from the data security perspective.

Cloud computing offers huge advantages for the financial services industry. Its huge storage capacity lowers the cost of storing data. It also has an "off-peak" computing power. Ming Shu compares this to electricity, which is charged at higher costs during peak usage times. It is the same for cloud computing; companies can use the cloud to run certain applications at nonpeak times, resulting in lower costs. This has reduced the barrier for some young financial services companies, who can use the power of the cloud rather than building their own IT infrastructure.

Relative to AI, big data, and cloud computing, blockchain is still at an early stage of development. Blockchain allows the identification and tracking of financial transactions digitally and the sharing of this information across a distributed network of computers. The distributed ledger system offered by blockchain provides a transparent and secure means of tracking ownership and the transfer of assets.

Of course, the early "killer app" for blockchain was Bitcoin and other digital currencies, says Ming Shu. Now, the Chinese market is looking for other ways to use the same technology

outside of digital currencies. He cites a Beijing-based company that has been using blockchain technology successfully to increase the efficiency of border trades between Guangzhou province and Vietnam. He also says there have been start-ups in China using blockchain to trade commercial papers and to split or make the transfer of supply chain finance instruments more efficient. These are at an early stage, but he sees a promising future.

Consumer finance has long been enabled by technology. For example, in China, FinTech is leveraging mobile technology to allow people who were previously underserved by the existing financial infrastructure to use and receive products that are suitable for their financial needs and to be able to enjoy the financial freedom and services.

Ming Shu believes that China, like many other countries, still has a long way to go. China's insurance market, for example, is still relatively underpenetrated. We are living longer and longer and therefore have more need for health and medical services. Health and life insurance will be an important part of our lives, and it just takes the right products to really awaken people's needs. He sees good prospects for companies that can really innovate with FinTech in their areas.

And, for investment managers, China is gradually maturing, with hundreds of millions of people now accumulating wealth. Whether that is housing-based or through other monetary means, a huge need for asset reallocation and investment services exists. This will create a major opportunity for financial services and FinTech going forward.

When it comes to competition between FinTech companies and traditional financial services, Ming Shu believes it will be a combination of challenge and collaboration. In the same way that electronic brokers ended up changing the industry, FinTech companies are showing the way forward and then either collaborating with financial institutions or being acquired.

It is clear that the winners in the financial market tomorrow will be those that embrace FinTech today.

# Hong Kong SAR

# HKMA Perspectives and Policy Stands on FinTech

## An Interview with Nelson Chow

### Larry Cao, CFA (interviewer)

In March 2016, the Hong Kong Monetary Authority (HKMA) set up the FinTech Facilitation Office to promote FinTech's development in Hong Kong as well as position Hong Kong as the FinTech hub in Asia. Nelson Chow, chief FinTech officer of HKMA, recently shared his perspectives on these issues with us in an interview.

#### What are the major trends that you are seeing in the FinTech development in Hong Kong?

**Nelson Chow** FinTech is believed to bring about benefits such as financial inclusion, operational efficiency, and better customer experience. At the same time, FinTech may also open up unforeseen risks including cybersecurity, data privacy, and cross-border legal and regulatory issues. The regulatory approach of the HKMA on FinTech is to maintain a delicate balance between encouraging innovation and ensuring financial stability and consumer protection.

Against this background, the HKMA established the FinTech Facilitation Office (FFO) in March 2016 to facilitate the healthy development of the FinTech ecosystem in Hong Kong and to promote Hong Kong as a FinTech hub in Asia. It acts as

1. an initiator of industry research in potential application and risks of FinTech solutions;
2. a platform for exchanging ideas of innovative FinTech initiatives among key stakeholders and conducting outreaching activities;
3. an interface between market participants and regulators within the HKMA; and
4. a facilitator to nurture talents to meet the growing needs of FinTech in Hong Kong.

With the rapid technological advancement, various innovations such as Open Application Programming Interfaces (API), virtual banking, and Distributed Ledger Technology (DLT) are some examples that help the banking industry improve operational efficiency, achieve financial inclusion, deliver services to underserved markets, and offer better customer experience.

Open API allows better and easier system and service integration between banks and other industries that provide lifestyle, health care, and retail services. Effective implementation of Open API will enable, for example, information of different banks' products and services to be aggregated under the same website/app for comparison and financial planning by users with ease. Users can conveniently stay on one system to enjoy all services offered by both the banks and other industries in a secure environment. In view of the aforementioned benefits, the HKMA is formulating an Open API framework to facilitate the banking industry in adopting Open API effectively and securely.

Virtual banks are expected to provide additional impetus to the application of FinTech in Hong Kong and offer a new kind of customer experience in mobile and digital banking. They may also help promote financial inclusion as they normally target the retail segment, be they individuals or small and medium-sized enterprises. To facilitate the introduction of virtual banking in Hong Kong, the HKMA prepared a revised "Guideline on Authorization of Virtual Banks," which was issued in May 2018.

As DLT matures, there has been increasing applications of the technology. For example, riding on the success of the DLT Proof-of-Concept work on trade finance led by the HKMA in 2017, seven banks in Hong Kong decided to commercialise the prototype into a production system named Hong Kong Trade Finance Platform (HKTFP) to digitise and share trade documents, automate processes, and reduce risks and fraud. Also, the HKMA and the Monetary Authority of Singapore are jointly building the Global Trade Connectivity Network, which will connect Singapore's National Trade Platform with the HKTFP to form a cross-border DLT infrastructure in order to digitalise cross-border trade and trade finance processes, and make them safer, more efficient, and cost-effective.

**How are these FinTech activities affecting existing financial institutions? For example, are they disruptive to the financial services industry or complementary? How are the incumbents responding?**

FinTech activities have driven tremendous changes and reshaped the landscape of financial services. In the past few years, we have observed more collaboration between financial institutions and technology firms to achieve a win-win situation. They partnered with each other to leverage technologies to reduce costs, improve efficiency, and enhance quality of financial services. The collaboration has led to creation of more diverse services, previously untapped market segments, and better customer delivery channels and experience.

To harness digital innovation and reap the benefits of technological advancement, the HKMA announced the launch of the following seven initiatives to prepare Hong Kong to move to a new era of Smart Banking:

1. developing the Faster Payment System to achieve full connectivity of digital retail payments;
2. introducing an Open API framework;
3. enhancing FinTech research and talent development;
4. stepping up cross-border collaboration in FinTech;
5. upgrading our existing FinTech Supervisory Sandbox (FSS) 1.0 to Version 2.0;
6. facilitating the introduction of virtual banking; and
7. promoting a new Banking Made Easy initiative to minimize regulatory frictions in customers' digital experience.

**What is HKMA's position in regulating the FinTech activities? For example, what are the general principles? What is HKMA's view on regulatory sandboxes? How do HKMA and the FinTech players view the level of success of the "sandboxes" in Hong Kong and elsewhere?**

The HKMA, as a regulator, believes that a market-driven FinTech development would bring various opportunities to the traditional banking model to meet customers' demands.

Specifically, the HKMA takes a risk-based and technology-neutral approach to regulations. It responds to market and FinTech developments in order to ensure that a good balance between innovation and risk is maintained. For example, the HKMA introduced the Stored Value Facilities (SVF) licensing regime in 2015 and has been facilitating the establishment of virtual banks to meet market needs. It also introduced the FinTech Supervisory Sandbox (FSS) in 2016 and upgraded it to FSS 2.0 in 2017 to facilitate trials of FinTech initiatives with proper safeguards in place.

The FSS allows banks and their partnering technology firms to conduct pilot trials of their FinTech initiatives involving a limited number of participating customers without the need to achieve full compliance with the HKMA's supervisory requirements. This arrangement enables banks and tech firms to gather data and user feedback so that they can make refinements to their new initiatives, thereby expediting the launch of new technology products and reducing the development cost.

The FSS was well received. By the end of April 2018, 32 technology products had been tested in the FSS. Out of these cases, 22 pilot trials have been completed, and the products have subsequently been rolled out.

### **What are Hong Kong's strengths and weaknesses regarding the development and adoption of these technologies?**

Hong Kong is a well-established international financial centre with robust and efficient financial infrastructures such as interbank clearing and settlement systems (covering the Hong Kong dollar, US dollar, renminbi, and euro) and the presence of a large number of international IT companies and service providers. In addition, the sound legal system and cosmopolitan business environment give great confidence to the private sector to develop FinTech. The extensive funding opportunities, government support, and great pool of world-class talents have helped Hong Kong to attract 48 of the top-100 FinTech companies to operate within it. Last but not least, Hong Kong has a natural advantage both geographically and culturally. It can act as the bridge to facilitate Chinese FinTech firms to extend their business globally and as the stepping stone for multinational FinTech firms to enter the Chinese market. All these provide Hong Kong with the necessary ingredients and success factors for becoming a FinTech hub.

The impact of FinTech on a mature market such as Hong Kong is different from that on other less developed markets. For example, the high penetration rate of credit cards and the large banked population will drive different demands and acceptance of the same FinTech solution by Hong Kong residents compared to those of other jurisdictions, say, mainland China. Having said that, the FinTech landscape in Hong Kong is rapidly changing. Take the use of SVF as an example. Since the introduction of the SVF licensing regime by the HKMA in 2015, 13 SVF operators and three banks have issued SVF. These operators and banks are actively expanding their coverage and launching new services, including payment of taxi fares, e-tickets, electronic wallet management for family members, online shopping, remittance, insurance, QR code payment, etc. The total value of SVF transactions was around HK\$38.7 billion for Q4/2017, up 27.7% over the past year. The HKMA will continue to facilitate the adoption of FinTech technologies and make sure a good balance between market development and user protection can be achieved.

The shortage of FinTech talents is a problem faced by many markets globally. Hong Kong is no exception. To address the issue, the HKMA has taken measures to facilitate and nurture talent development. For example, the HKMA rolled out the FinTech Career Accelerator Scheme (FCAS) in December 2016 to offer internship positions for students to work on FinTech-related projects at the HKMA or participating banks. FCAS was upgraded to FCAS 2.0 in January 2018 with an enhanced gap-year placement programme, a new entrepreneurship boot camp, a new Shenzhen summer internship programme, and a new fresh graduate programme, each targeted at young talents at various stages of their career development.

# 2018 FINTECH START-UP SCENE IN HONG KONG SAR

Brandon Chung and Janos Barberis

2018 is an important year for Hong Kong's FinTech start-up scene.

Three years ago, Hong Kong was defining itself (e.g., what specialism as a FinTech hub it should choose), government bodies were beginning to coordinate efforts (e.g. external promotion and local regulation), and start-ups were focusing on both business and education work with their clients.

Today all stakeholders from private sectors to civil servants have matured in their understanding of FinTech; in short, the industry is professionalizing itself. Although a positive development, it means that experimentation strategies have less room, and accountability on results will be expected.

Hong Kong's narrative as a business-to-business (B2B) FinTech hub is now well established—the opportunities of Hong Kong are depicted as financial renovation led by banks' digitization effort as opposed to revolution led by start-ups changing the status quo.

Compared to the rapid development of business-to-consumer (B2C) FinTech products in China (e.g., peer-to-peer lending platforms) or certain parts of Europe (e.g., challenger banks), Hong Kong's relatively slow B2C FinTech market development could be mistakenly perceived as a lack of ambition. However, focusing on B2B FinTech has the benefit of practicality. Hong Kong's market size, consumer inertia, and entrenched financial infrastructure limit the immediate appeal of disruptive B2C FinTech products. Although the banking experience has definite room to improve, the existing product availability, cost, and accessibility are convenient.

Therefore, Hong Kong lacks certain features (e.g., market inefficiency, public distrust, prescriptive regulatory pressure) to power a sudden and radical change in finance. It is difficult to drive a 10-, to 100-fold improvement in user experience, such as the ones that Alipay or M-Pesa created by revamping the payment landscape in China and Africa. However, we should not misread this as a negative. With 70 out of the world's largest 100 banks operating in Hong Kong, there is ample headroom for FinTech start-ups whose value proposition is to resolve banks' long-standing internal pain points (e.g., know your customer, know your business, and anti-money laundering) and enhance their offerings (e.g., financing solutions for small and medium sized enterprises).

This then begs the question: what has therefore been Hong Kong's track record of B2B FinTech partnerships? Can Hong Kong be benchmarked and its FinTech position tested? The short answer is that limited public information exists and transparency is not yet the norm. In Hong Kong, partnerships with start-ups are too rare and few are broadcasted. Exemptions

include high-profile deals such as Nomura's 2018 strategic investment in 8 Securities. Hong Kong would benefit by being transparent on this as it would set a realistic expectation of the opportunities and difficulties of closing deals—until then, start-ups will have to rely on the generic "industry average of 12 to 18 months" or better direct start-up feedback.

From an accelerator standpoint, it seems that in the relationship between banks and start-ups, the latter have matured quicker in terms of a partnership engagement framework. The observation that FinTech start-ups now have multiple integration methods (e.g., Application Programming Interface, core banking adapters, mobile, web, on premise, cloud) in place earlier in their product roadmap is a case in point. This is perhaps unsurprising, as start-ups will test their sales, technology, and pricing approaches to dozens of banks, thus quickly multiplying the amount of feedback they incorporate. Banks, on the other hand, might engage less than a handful of start-ups at any given time, and that learnings the learnings from these engagements are usually kept in silos.

In practice, banks that don't change their procurement process to suit start-ups will lose out. Start-ups making dozens of sales will choose the route of least resistance due to limited resources (no time to go through heavy nondisclosure agreements and legal documents). A case in point is the regulatory technology (RegTech) space. Many start-ups have sold Know Your Customer (KYC) solutions to Initial Coin Offerings wishing to conduct due diligence on investors to ensure immediate compliance obligations. Likewise, many start-ups in the insurance, wealth, and payments space are working with and increasingly being acquired by technology companies. The point is this: Technology and products developed by FinTech start-ups have a broader customer base than the financial services industry alone.

The nature of a bank–FinTech partnership is complex, and an opaque corporate structure creates yet another barrier. That barrier is slowly being lifted as we speak, albeit with difficulty. The necessity to align the interest of the business (i.e., interest in the product) and IT stakeholders (i.e., feasibility of the technology) is still work in progress. A clear vision of FinTech engagement from the executive team is paramount to setting the tempo across the bank. From a collective buy-in of a vision emerges an organization and incentive structure that empowers silos to communicate and drive towards the goal of collaboration.

To fully harness Hong Kong's natural B2B advantage, a few changes should be made. Failing to do so will leave doubt as to whether Hong Kong was ever a potential leader as a B2B FinTech hub. Doing so but failing would highlight that the market is neither there nor ready, meaning that Hong Kong needs to find another narrative for its start-up community. Call it a citywide pivot, if we would take a start-up's terminology.

From our experience, here are three suggestions that could be considered:

1. Document and publish B2B FinTech partnerships: "You can't manage what you can't measure." The quote from Dr. Robert Kaplan reflects the current state of affairs. To manage and improve B2B FinTech partnerships, there must first be a consistent, unbiased, and detailed set of progress records; any other alternative is an illusion of progress. This "documenter" should be an unbiased entity trusted with sensitive partnership information—an independent think tank is a good example. This will not only create a set of time-stamped data, but also start crafting a unified narrative of Hong Kong as a locus of B2B FinTech partnership.

2. Establish recurring FinTech B2B experience-sharing events: In conjunction with the above, the same entity could host monthly events to share progress and partnership best practices. Here the objective is not only brutal transparency but also a forum for constructive feedback. The more events, the shorter the cycles for feedback, and the more rapid the improvement.
3. Facilitate a set of industry technical standards for FinTech partnerships: Much like how the European Banking Authority sets regulatory technical standards for financial institutions under the revised Payment Service Directive, Hong Kong should consider a standardized framework to expedite start-up onboarding. This could be done via an industry steering group to create a common standard. Given the Hong Kong regulator's suggestive rather than prescriptive approach, we would expect the private sector (e.g., a consortium of banks) to lead this under the guidance of the public sector.

Of course, this is not the whole story. If anything, the above only reflect a view of the market with current information. Hong Kong is being defined by rapid change, and with change will come new opportunities for both B2B and B2C FinTech start-ups. If initiatives such as the Open API and Virtual Banks continue to blossom, we believe this will eventually lead to a strong product-market fit for B2C FinTech start-ups. In addition, HKEX's revised listing rules for technology companies will provide fresh capital and liquidity for many start-ups in the region that have raised venture capital for the last 3 to 5 years—several regional countries have engaged in similar reforms of their stock exchange, but none has the same appeal and aura as a listing on HKEX.

As the pre-Socratic Greek philosopher Heraclitus noted: "Change is the only constant in life." Either driven by regulatory reform, intensified regional competition, or capital market changes, Hong Kong's FinTech narrative will continue to evolve. If anything, this snapshot of the ecosystem serves as a stark reminder that the pace of change within the industry is now counted in years and not decades. The continuous review of assumptions and evaluation of progress should be ever-more rigorous; the ones who master this principle will be able to craft the next iteration of Hong Kong's FinTech ecosystem.

# India

# DEMYSTIFYING FINTECH IN INDIA

Manish Jain, CFA

Manoj Khokale, CFA

Jitendra Kumar, CFA

The year 2017 witnessed record deals by private equity/venture capital firms clocking around US\$24 billion worth of investments in India, which is about 50% higher than in 2016. The technology space commanded the highest investments in terms of deal value followed by financial services. The FinTech sector is at the intersection of the technology space and financial services. The startup space benefitted significantly during the year and is estimated to have raised around US\$13.5 billion in investments, and the FinTech sector US\$3 billion. This is backed by strong investor confidence in Indian markets due to the opportunity of a large untapped informal economy along with a government push to boost cashless transactions and economic inclusion of the Indian population.

So, how do you define FinTech? Even though this term is used rather loosely, according to the Financial Stability Board (FSB), "FinTech is technologically enabled financial innovation that could result in new business models, applications, processes, or products with an associated material effect on financial markets and institutions and the provision of financial services." So, under the umbrella of FinTech, with the help of technology, the startups and incumbent financial institutions are solving the age-old problems of banking and the financial services industry with new products and services.

As described above, the FinTech space is attempting to solve multiple problems, which can be categorized into the following broad categories.

## Payments and Money Transfer

Mobile-based payments such as Wallets, P2P (peer-to-peer) transfer apps, and mobile PoS (point-of-sale) applications fall under this category. In 2017, the majority of FinTech funding happened in this space, with Paytm raising US\$1.4 billion and PhonePe (owned by Flipkart) raising US\$500 million. Out of the 78 top FinTech startups in India, about 29 are working in this space. After the government's demonetization drive in 2016, there was a phenomenal boost to the number of digital transactions. Paytm witnessed a 700% increase in overall traffic and 1000% growth to Paytm wallets. Overall digital payments surged 55% in 2017.

The government's "Pradhan Mantri Jan-Dhan Yojana" (PMJDY) is a scheme for financial inclusion by providing bank accounts to all. With Jan Dhan accounts linked with Aadhaar and Mobile numbers (the JAM trinity), the government is targeting providing direct subsidies to underprivileged sections of society. This has opened up phenomenal opportunities in digital transactions. The National Payment Corporation of India (NPCI), an initiative of Reserve Bank of India (RBI) and the Indian Banks' Association (IBA), is an umbrella organization for creating a robust payment and settlement infrastructure. Their products—Rupay cards

and Bharat Interface for Money (BHIM)— along with United Payments Interface (UPI), are already quite popular. UPI is used by several banks and mobile payment apps. NPCI has several other products and initiatives. However, there has been a dip in digital transactions after remonetization in 2017. It is estimated that digital transactions constitute only 10% of overall transactions in terms of volume. With an increase in smartphone penetration and falling mobile data costs, there will be faster adoption of digital payments. The India digital payments industry is expected to be US\$500 billion by 2020, according to a report by Google and Boston Consulting Group.

## Alternative Lending and Capital Raising

Alternative lending and capital raising are expected to be promising areas for growth in India. A huge unbanked population exists such as small businesses that the traditional banks do not finance. Additionally, a large number of Small and Medium enterprises (SMEs) and MSMEs are credit hungry to meet their working capital needs and in need of short-term financing. The alternative lending space is targeting this segment with effective use of technology. Peer-to-peer lending (P2P) and crowd funding are most prominent in this category. The P2P lending startups offer online platforms to match lenders with borrowers. Although traditional banks rely on credit scores from the credit bureau, the P2P lending startups use algorithms and integration with India Stack and Aadhaar. This credit profiling uses more data points (like social media) than does the credit bureau and tries to quantify not only the ability to pay but also the customer's intention to pay. Further, the entire credit profiling can happen in a matter of 30–45 minutes, enabling quick customer onboarding. P2P lending is said to be a form of crowd funding, but along with debt financing, crowd funding platforms raise equity capital for startups. Many startups have partnered with banks and non-bank financial company (NBFC) for financing along with committing their own capital. For example, startup BillionLoans has partnered with Yes Bank and ICICI Bank. On the other hand, startups Kissht and EarlySalary are lending their own money instead of partnering with a bank. Some FinTech firms like KredX specialize in the market for invoice discounting to provide quick access to working capital.

In October 2017, the Reserve Bank of India released guidelines for NBFCs to operate P2P lending platforms, defining its scope of activities, transparency, and disclosure requirements and adding more clarity and legality to the business. Alternative funding is said to be the second most funded space from the past few years. In the first half of 2017, alternative lending startups had raised about US\$50 million in funding, including MoneyTap, EarlySalary, LoanTap, ZipLoan, and a few others. According to Inc42 Datalabs, this business could grow up to US\$4 billion–5 billion by 2023.

## Wealth Management

Perhaps one of the biggest beneficiaries of demonetization was the equity markets. By November 2017, one year after the announcement of demonetization, the Sensex and Nifty had gained 22% and domestic mutual funds had invested Rs.1.17 lakh crores. It was never a better time for wealth management advisories, and along with traditional practices, robo-advisory services started gaining popularity.

Investopedia defines a robo-advisor as "an online wealth management service that provides automated, algorithm-based portfolio management advice without the use of human financial planners." Interestingly, automated advice generation has been around for quite some time. Asset allocation based on clients' personal, financial, and risk profile data also has been in vogue for decades. However, it was mostly designed for use by advisors rather than the end-consumers. Robo-advisors take this to the next level, where investors can directly access these services through the robo-advisor platforms.

The financial advisory market is fast adopting these tools to reach out to the millennials who are expected to be inheritors of US\$2 trillion in assets along with its accompanying growth. Robo-advisory platforms can be designed to serve this huge market cost effectively by offering it as an added layer to existing services for mass-affluent, high-net-worth (HNI), and ultra-high-net-worth (UHNI) clients. India, with the significant smartphone and data penetration, the introduction of Aadhaar-based eKYC, the Jan Dhan bank account for all, and a big push to digital payment channel post demonetization, is opening the gates to a more formal economy. Digital players like Paytm Money and others are eyeing a significant market share using the technological prowess they possess.

Some firms like Clearfunds and Scripbox offer only mutual funds, whereas firms like Wixifi and FundsIndia offer robo-advisory services for both mutual funds and equity. Also, players like Scripbox and FundsIndia have adopted the traditional mutual fund distribution model, and some others like Clearfunds and ArthaYantra have adopted the investment advisory model by charging a fee to clients.

## Pros and Cons of Using Robo-Advisors

**Figure 3.1 Benefits and Limitations of Robo-Advisors**

BENEFITS	LIMITATIONS
Lower cost	Standardized offering
Lower asset thresholds	Lack of personalized advice
No errors, no emotional bias, and accurate; algorithm based	Incomplete information (not meeting high standard of care)
DIY appeals to millennials & self-directed users	Lack of personal interaction
Greater fee transparency	Simplistic assumptions

## Insurtech

This sector is witnessing increasing interest from investors, with new players entering along with incumbent insurers offering a technology-based solution. Insurtech is leveraging on offering customized insurance solutions and reducing insurers' costs. However, the opportunity exists for technologies like artificial intelligence (AI) and machine learning (ML), big data and analytics, and blockchain to contribute by bringing efficiencies in terms of customer on-boarding and claim settlements.

US-based startup Sureify offers a platform that connects insurers with consumers' mobile phones and their health and wearable devices, and integrates with social media, providing options to engage with consumers. Sureify provides solutions that offer fast underwriting along with accurate risk assessment-based decisions at the point of sale. Other business models like microinsurance offer insurance for very small value or a short time- frame, and P2P insurance, which pools premiums in a peer network to insure against a risk.

Currently, most funding in Indian insurtech startups is through online insurance broking/ aggregators. Startups like Policybazaar and Coverfox fall in this category. The insurance sector is bound by heavy regulation and the technology innovations must go hand in hand with the opening up of regulations to facilitate new business models. As per the Economic Survey 2018, insurance penetration (the ratio of premiums underwritten in a given year to the gross domestic product [GDP] in India) is only 3.49% and is well below the global average, including China's, which is at 4.77%. This shows the huge opportunity for this space in India.

## Banktech

FinTech is now driving an evolution in the existing business and operation models of banks, helping them cut down on overhead. It is resulting in a pull model that targets customers irrespective of location. With technology eradicating physical boundaries, banks and financial institutions have also been able to supplement and boost services such as customer acquisition, online shopping, travel/entertainment services, and more. Banktech has led to the rise of AI-driven marketplaces where customers and banks are interacting in ways never seen before.

We are experiencing a digital shift in all walks of life. As we progress, AI will ultimately drive this shift with the ultimate goal of improving customer engagement and overall experience. These are two crucial factors measuring business success, and they can be perfected by implementing AI to study historical data with regards to customer habits and preferences. These actionable insights into the evolving new-age customer enable service providers to differentiate themselves from the competition. Conversational AI (chatbots that can interact at near human level) plays a key role here. What initially began as a simple customer response system has become a dynamic virtual assistant that every leading bank is implementing. HDFC OnChat and EVA, SBI InTouch, YES mPower, YES Pay Bot, and Digibank are just a few notable examples.

Blockchain (distributed ledger technology or DLT) may have gained popularity from the context of crypto currencies, but there are other use cases that financial institutions are leveraging, using this technology in the areas of smart contracts, settlements, and trade finance. Blockchain offers complete and secure transactions without the need for central authority. It allows peer-to-peer (P2P) transactions that are more efficient and secure when compared to existing technologies. The smart contracts can by themselves execute, verify, and enforce performance, and they can find their applications in trade finance, derivatives trading, or robo-advisory services.

The RBI has suggested a roadmap for the adoption of blockchain in India and has already conducted a proof of concept for trade finance, jointly with NPCI, SBI, PNB, HDFC, Citi Bank, Deutsche Bank, and MonetaGo. In the last few years, other banks like ICICI Bank, Kotak Mahindra Bank, Mahindra & Mahindra, Yes Bank, and Axis bank have tested blockchain use cases in partnership with other institutions.

## Regtech

Regulatory Technology (RegTech) is still at a nascent stage but promises an enormous scope of opportunities. Financial institutions spend enormously on regulatory compliance. RegTech firms use technologies like cloud computing, big data, artificial intelligence, and blockchain to help financial institutions comply with regulations efficiently and at a lower cost. They help monitor business processes, regulatory reporting, protecting customer interest, and fraud detection. With the technology they have advantages like shared utilities between firms, advanced analytics that can interpret large amounts of structured and unstructured data, and interactive technology (e.g., robo handbook) that allow firms to understand the impact of regulations on their systems and processes.

FixNix is an Indian firm that partners with RBI and offers solutions in the area of governance, risk, and compliance to institutions like co-operative banks, lending institutions, and payment banks. The Indian startup space is expected to witness significant investments in this area.

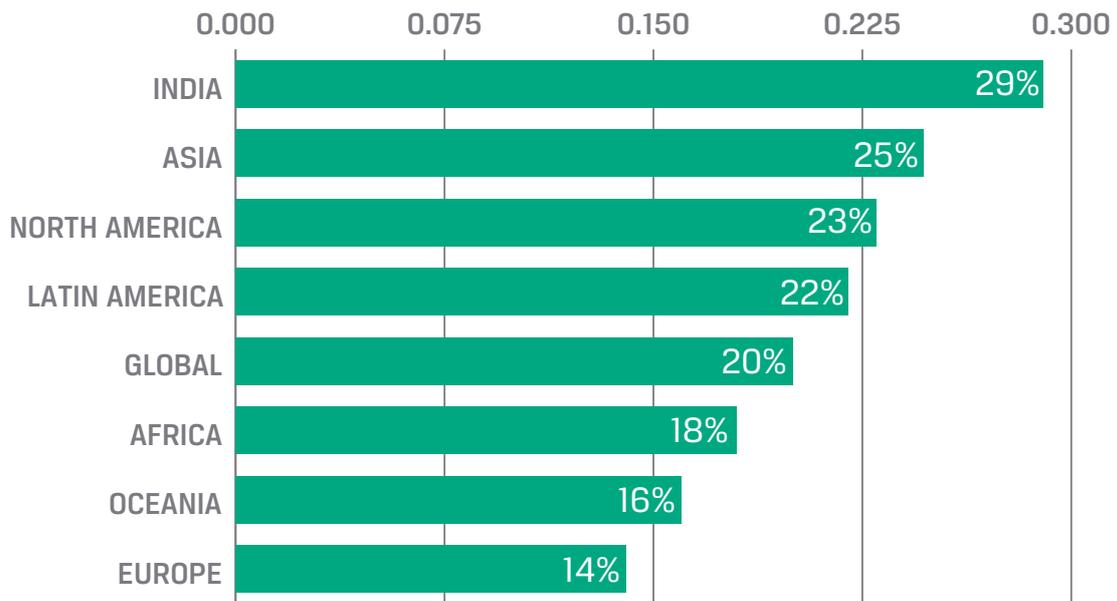
## Conclusion

Some sectors within FinTech have reached a certain level of maturity, but other sectors are still at a nascent stage and promise a huge opportunity in the Indian landscape. Kazi A Zaman, CFA, partner at GestAlt Network LLP, says, "Lending and payments to the unserved bottom of the pyramid will be the big growth engines to my mind. Robo-advisory is already a cluttered space with sub-optimal unit economics." This is supported by rapid technological adoption by Indian consumers. As per an Ernst and Young report, the FinTech adoption index for India is at 52%, well above the global average of 33%. According to PricewaterhouseCoopers, FinTech investments in India offer an expected ROI of 29% against a global average of 20% (see Figure 3.2).

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**Figure 3.2. Expected Annual ROI on FinTech Investments**

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SOURCE: FinTech Trends Report India 2017 - PWC and Startupbootcamp

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Although the innovations in FinTech space are expected to cause major disruptions in the financial services industry, some incumbent financial institutions view FinTech startups as partners and others as competitors. They are either collaborating with the startups or investing themselves in technology. Umesh V. Kudalkar, CFA, director at Multi-Act Trade and Investments, opines, "I think smart FinTech entrepreneurs might take off exponentially leaving the incumbent bureaucratic financial services firms behind. 'Collaboration wins over competition' may be a politically correct statement but may not be a sustainable phenomenon. Smart FinTech entrepreneurs may collaborate just for the sake of 'proof of concept' for raising venture capital funding. Remember how in the 1980s ... startup Microsoft used incumbent IBM as a launch pad?" It is through innovation from the FinTech sector along with strong support from the Finance Ministry, regulators, and the central bank that real economic benefit can be brought to the Indian population.

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# THE FINTECH LANDSCAPE IN INDIA: FROM PAYMENTS TO ALTERNATIVE LENDING

## An Interview with Vivek Belgavi Larry Cao, CFA (interviewer)<sup>1</sup>

India is a vast country with tremendous growth potential. Constrained by a developing banking system and financial services industry, many people and businesses are not getting the funding and other financial services that would allow them to achieve their growth potential.

The setup sounds like a market made in heaven for FinTech entrepreneurs. So how are FinTech businesses developing in India? We recently had the opportunity to speak with Vivek Belgavi, partner and FinTech leader at PwC India. Below are some of the topics that we covered.

### **What are the major trends that you are seeing in India's FinTech development?**

**Vivek Belgavi:** Traditionally FinTech action has been centered around payments. Within the payment area, the focus is moving to (1) improving online security and user experience, and (2) enhancing offline payments. The third trend within the payment area is smart city and transit payment plans, both large infrastructure projects pushed by the government.

Over the last year, we also saw a lot of action in the alternative lending area. Robo-advice and insurance are becoming more and more active, although overall not as much as payments or alternative lending.

From the technology capabilities side, blockchain could be at a tipping point this year. Many companies were testing use cases or launching pilots last year. Most of the initiatives might be available for use this year and some may scale up.

The structure and resiliency of banking assets is a big and contemporary issue for Indian banks. There are a few applications which focus on the fraud detection and smart reconciliation that are getting good traction.

The third area is digital experience, such as smarter chatbots or applications building voice into conversations. The voice-related application might have a big impact on India's economy in the future.

### **Let's start with the payment area. How is the payment market shaping up in India? Who are the major players?**

The payment business is interestingly poised right now. In the past year, most applications were related to mobile wallets. Paytm is leading among the mobile wallet applications.

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<sup>1</sup> Oscar Tai contributed to this article.

Besides Paytm, there are other popular applications like Mobikwik, Oxigen, and PayU. Banks also launched their own mobile wallets.

In the last two quarters, the India payment market has been going through changes with the launch of UPI [United Payments Interface], which is a more open infrastructure. Google and WhatsApp have launched their own payment solutions based on UPI. In the last two months, UPI digital transaction volume has overtaken the mobile wallets.

So the India payment market has certainly become more competitive. One year ago, Paytm might have dominated the market. But now, there are different players, like Google, Whatsapp, BHIM [Bharat Interface for Money], and other bank applications.

### **How do banks see the new entrants in the payment market, like Paytm?**

Banks are competing with new entrants, but also collaborating with them. The payment bank license has been issued by the regulators for a couple of years. Some new entrants, like Paytm, already have their own payment bank. With the payment bank license, the new entrants can take deposits and enable payment transactions but cannot offer any asset products. It competes with banks in the payment area, but also ties up with banks in other areas, such as distributing products, loans, and mutual funds.

UPI is changing the market. Through UPI, people will not need to move money from the bank account to a mobile wallet. Still, the incumbents are losing relevance in the customers' minds. For example, the business campaign and risk model of credit card companies are based on the customer profile. UPI might keep the card company from seeing where the money is going. Those concerns are pushing incumbents to do large-scale partnerships.

### **Do you think the status quo is stable? What do you think is the end game?**

I think it will evolve further. The industry will align along two tiers and there will be manufacturers and distributors. Those with a natural affinity with customers such as Google, WhatsApp, and maybe Paytm can leverage their engagement platforms with customers and build a strong position. There'll likely be four or five Tier 1 players of this type, covering 70–80% of the market. Then there'll be seven to eight Tier 2 players in various niche markets. The Tier 1 and Tier 2 players will be supported by a group of manufacturers.

### **How has India's alternative lending space evolved?**

There are about 40 million to 50 million merchants in India. Less than 4 million of them have some access to digital payment mechanisms. Starting from two to three years ago, many of these merchants became vendors on the ecommerce platforms. Suddenly we knew much more about them. The first generation of alternative lenders such as LENDINGKART, NeoGrowth, and CapitalFloat mushroomed around these opportunities.

Now we are seeing the next generation of these evolve. Lenders are now lending to the offline vendors piggybacking on the online transaction data.

Another large tailwind in this business is related to the invoice data that became available following the implementation of the GST regime 6 months ago. The invoice-based discounting proposition is poised to take off.

### **Longer term, will the alternative lending compete with banks or serve different clients in the market?**

Most alternative lenders follow a mixed model, keeping 30–60% on their own books, and placing the rest with non-bank financial companies (NBFCs) for reasons of agility or easier Know Your Customer (KYC). They gained an early advantage in this business because (1) this was a segment previously deemed unprofitable so there was much white space, and (2) these alternative lenders have agile technical structures to capture these opportunities.

In addition to the first-generation alternative lenders we mentioned, other players such as Paytm, which has a large customer base, may start their own NBFC and also enter the alternative lending market.

Alternative lenders are working with select banks, which have a larger cash reserve that needs to be lent out. As the alternative lending market lacked adequate information in the past, incumbents ignored it. As more data become available, larger players may also enter this segment.

### **How about robo-advice?**

The traditional investment management distribution model is commission based and has its inherent biases. So the case for robo-advice in theory is that it will provide customers with unbiased and solid financial advice. And yet in reality, most robo-advisors have not been able to scale up in India. The model gaining traction now seems to be a sharpshooter model, where they build a platform, make a recommendation, and allow people to get into a position quickly. So it's become a hyper-scale distribution model rather than unbiased advice.

### **What are some of the major developments that you are seeing on the insurance side?**

There's traction on the product side in general insurance, the property and casualty, and property areas, especially home, auto, and health sectors. Traditionally we have not had many variable pricing products in India. Now there are many experiments linking good driving or good health to pricing. This is mostly made possible through collaborations between FinTech startups, which bring the technology and solution, and incumbents.

### **What are the regulatory challenges for India's FinTech development?**

One common tension with regulators is how much to price risk. Regulators want to protect consumers and the economy. FinTech startups believe they have new data streams and better risk models to apply. Many models require longer back testing though, for example insurance, and the data are not available. So this is the common cause of tension between the FinTech startups and the regulators.

# HDFC'S APPROACH TO FINTECH

## An Interview with Nitin Chugh

Larry Cao, CFA (interviewer)<sup>1</sup>

As FinTech popularity grows, the response from banks, and more broadly, the financial services industry, is an important factor in determining the industry's future. We recently had the opportunity to speak with Nitin Chugh, head of digital banking at HDFC Bank, the largest private sector bank in India, and discussed HDFC's approach to FinTech.

### What areas of FinTech has HDFC been actively engaged in?

**Nitin Chugh:** We started our early engagement in payments three years ago and launched a UPI [United Payments Interface]-based app. There are so many people trying to get into payments so the area will remain active for a while. What's significant now is that tech giants such as Google and WhatsApp are also getting into the business. There are very few solutions accepted on the merchant side, so there is a lot of consolidation going on.

Most recently, the bank is focusing on (1) artificial intelligence, with applications in loans, process, and risk management, and (2) customer experience, in analytics and real-time marketing.

### Let's talk about mobile payment first. Has this been a growing segment? Is Paytm taking market share from banks?

Paytm has been able to attract a disproportionate amount of capital, so they continue to dominate among the FinTech mobile payment players. Most other players have not been able to scale up on the user side. Paytm is targeting mostly the underserved segment though, so they are not in direct competition with the banks.

Since UPI was launched in India a year ago, banks have been handling most of the transactions on the platform, including for third-party payment service providers such as Google. So banks are growing their business on their own and through partners such as Google.

### What are your thoughts on applying artificial intelligence in finance?

We are pursuing AI at the digital level, not at the use case level. In my opinion, AI can be applied not only in customer service but also in the customer onboarding, transactions, risk management, and internal processes such as hiring.

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<sup>1</sup> Oscar Tai contributed to this article.

There are obvious areas such as customer service where AI makes sense, for example, chatbot applications. However, if organizations want to look at AI at a strategic level, they need to go beyond simply focusing on one or two applications. When we work with partners, we do not limit them to one or two use cases.

**You mentioned the other area of HDFC's focus now is customer experience.**

Digitization makes the customer interactions very impersonal. So, improving customer experience is very important. We'd like to create highly personalized and contextualized conversation and recommendations for the customer.

**How do you typically work with your technology providers?**

It is a model of partnership. We don't acquire the FinTech start-ups. We allow start-ups to work in ways in which they are most comfortable. In turn we can partner with many more FinTech firms than if we acquire or incubate a small number of them. We also work with universities. The solutions could also have come from large technology companies but, in our case, it turns out our partners in the past few years have mostly been FinTech start-ups.

**More specifically how do you work with your partners through the product cycle?**

In most cases, the start-ups will have 3 months for their products to scale up. If they do not after 3 months, the product needs to show it has the capability to succeed.

Sixty percent work and 40% don't work. When they do not work, it's usually because they do not scale up. There could be customer acceptance issues, technology issues, or the firm's internal problems. Some firms do not have sufficient funding to go on or important personnel leave.

Banks have historically faced the challenge of effective communications between the business lines and the internal IT department. What's your experience?

HDFC has professionals on the business side who understand technology and vice versa. They are obviously the experts in that area that you can lean on. It's critical that we speak the same language. Then you get the experts from technology, business, marketing, and compliance, etc. in one room to make sense of all things.

# P2P LENDING—A DEFINITIVE CHECKLIST

An Interview with Rajat Gandhi

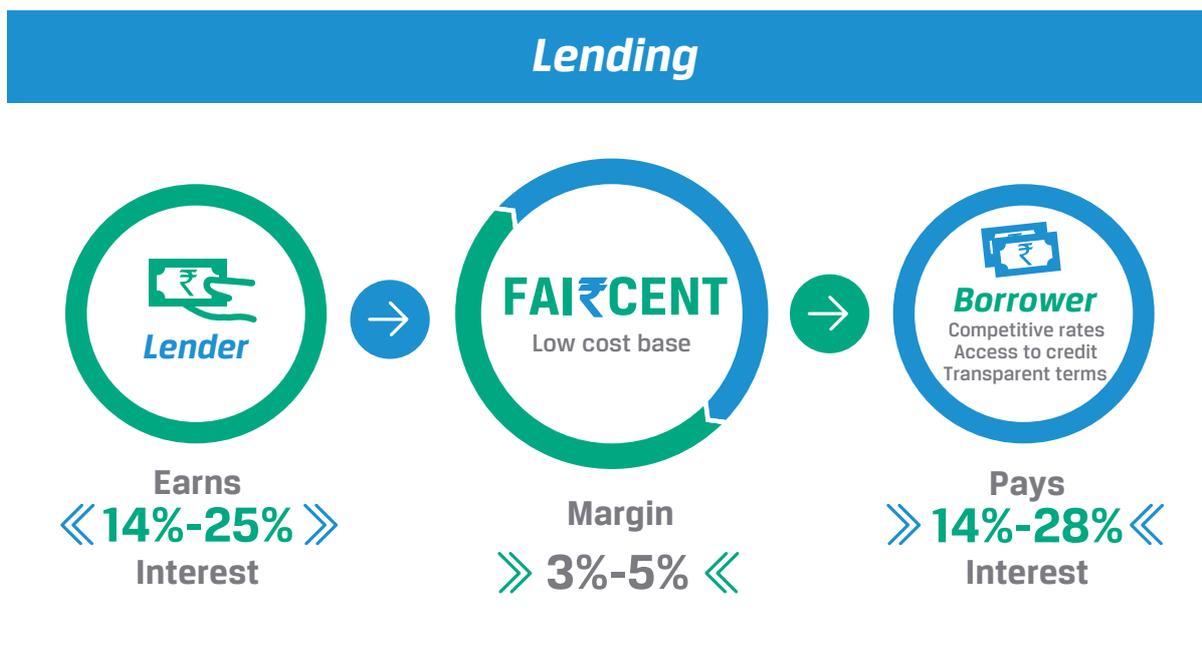
Varsha Dhamasia, CFA (interviewer)

Lending has existed for thousands of years. In recent years, it has been integrated with technology to create one of the most innovative financial products of recent times, that is, a technology-driven marketplace-lending platform with online peer-to-peer (P2P) lending, that has enabled creditworthy borrowers to lower their cost of loans and individual investors to lend directly to their peers, thereby earning higher returns. What makes online P2P lending even more rewarding as an investment is that it offers lenders diversification options across multiple risk buckets. With the recently announced RBI [Reserve Bank of India] guidelines and the creation of a regulatory framework, online peer-to-peer lending is set to headline financial technology's growth story. To shed more light on this up-and-coming disruptive force in consumer lending, we reached out to Rajat Gandhi, founder and CEO of Faircent, one of the leading players in the Indian P2P space, to share his insights.

## **What opportunities and challenges do you foresee for your business model vis-à-vis the competition both locally and globally?**

**Rajat Gandhi:** The opportunity lies in the over 600 million people and micro, small and medium enterprises (MSME) in this country that lack a credit record and are thus not eligible for credit from legacy financial institutions. These individuals and businesses need credit sometimes for very basic functions, such as sudden medical emergencies, business expansion, or raw material procurement, but are unable to do so even if they have a substantial turnover. In such circumstances, the only recourse for them is to use offline options, which are usually very exploitative; such channels generally offer loans at extremely high interest rates and provide low repayment flexibility to borrowers. The untapped market of potential borrowers in India is huge. This is where we step in. By using new technologies like AI and big data, we are able to cover a large segment of the unbanked or underbanked credit-needy population of India.

Figure 3.3 Peer-to-peer Lending



**P2P lending has been in India for only a few years and already more than 50 companies are operating in the field. How do you see the Indian P2P market shaping up in light of competition and RBI's new guidance—making NBFC-P2P license compulsory?**

We feel that the regulations are extremely progressive and a positive move. They will undoubtedly help online P2P lending platforms break into the mainstream financial market. It will usher in greater stability and credibility for the digital P2P lending model, thereby establishing it as a lucrative asset class like other market-linked investments such as mutual funds, SIPs, stocks, etc. Over a period of time, the increasing awareness will also drive large-scale financial inclusion by facilitating easier access to credit for the country's unbanked and underbanked segments.

**Do you think there will be a limiting effect due to the borrower cap and lending cap imposed by RBI?**

In my opinion, the cap of Rs. 10 lakh on lenders is restrictive. In fact, diversifying investments across multiple borrower categories is the best way for lenders to maximize their returns on P2P lending platforms. Even if it's a cautionary move, the limit is too low and should be revised upwards.

The P2P lending business model depends on both lenders and borrowers, and if sufficient funds are not available for lending, consumers will be driven to the unorganized sector, leaving them vulnerable to exploitation. This defeats the entire purpose of financial inclusion that P2P lending contributes to.

**Despite the P2P industry's existence for over 10 years globally, P2P firms have been grappling with issues such as frauds and delinquencies, creating sustainability issues for P2P operators. How do you think Indian players and regulators are gearing to face this, considering the Indian P2P market is still at a nascent stage?**

I feel RBI regulations will help. They have added credibility to the sector, helping it in realizing its true potential. Regulations require all existing platforms to register with RBI as NBFC-P2P;

thereby only legitimate P2P lending platforms will last. Also, as NBFC-P2P, online lending platforms will report to the credit bureau, which will help control defaults.

**How do you envisage P2P lending developing into a separate asset class?**

Lending is one of the oldest professions in the world. P2P lending allows lenders to invest surplus funds in loans. The annual returns from savings accounts are at 3.5%, PPF & NSC at 7.8%, and FDs at 7%. These returns are lower or at par with the average inflation rate (6.07% annually.). Real estate requires very heavy investments, Stock markets are extremely volatile and require investors with high- risk appetites, whereas mutual funds need long-term investments in order to generate high returns. In such a scenario, online lending allows lenders to invest their surplus funds by lending them out to people who need credit and are willing to repay the money lent with interest. The reasons why P2P lending is doing so well as an alternative asset class are simple: attractive, predictable investor returns protected from stock market volatility and the opportunity to diversify a portfolio with an alternative investment which was previously only available to institutional investors. The fundamentals of this asset class are extremely strong and will lead to its continued growth.

**Figure 3.4 P2P Lending in Comparison with Other Asset Classes**

CRITERIA	STOCKS	EQUITY MUTUAL FUNDS	DEBT MUTUAL FUNDS	FIXED MUTUAL FUNDS	REAL ESTATE	P2P LENDING
Returns	High	Medium	Low	Low	Low	High
Risk	Very High	High	Medium	Low	Medium	Medium
Monthly Income	X	✓	✓	✓	✓	✓
Minimum Investment Required	Any Amount	Any Amount	Any Amount	Any Amount	High	Any Amount
Uniqnity	High	High	High	Medium	Low	Medium

**What advice would you like to share with budding entrepreneurs?**

Think big and don't quit.

# Japan

# JAPAN FINTECH: CRYPTO-CURRENCY EXCHANGE, ALTERNATIVE LENDING, AND MORE

An Interview with Seiji Kamiya and Kenji Hoki  
of KPMG Japan

Larry Cao, CFA (interviewer)

Japan remains the second largest economy in the Asia Pacific region and an active market for FinTech development. We recently spoke with Seiji Kamiya and Kenji Hoki of KPMG Japan about what's hot and what's not on the Japanese FinTech landscape.

## What are the active areas of FinTech development in Japan?

**Seiji Kamiya:** The first is the cryptocurrency exchange business. The Japanese government was the first government to force the exchanges to register. Japan's Financial Service Agency is active in regulating Bitcoin and other cryptocurrency markets, a very different position than many other governments take. Almost 30% to 40% of the world's Bitcoin exchanges are in Japan. On the other hand, most Japanese traders are amateurs, so the Japanese government has to regulate this market more actively.

Peer-to-peer lending, or P2P, also has a huge potential in Japan. For example, Amazon is planning to start a commercial loan business in Japan which targets small enterprises.

Mobile payment has not made much progress in Japan. The Japanese people are still willing to use cash.

**Kenji Hoki:** Cash payment is still preferred to mobile payment. Using QR codes connected to banking accounts is an emerging trend though. Alternative lending and insurance [applications] are increasing gradually.

AI/big data is at the core of competitiveness to provide personalized services to the mass market.

## What areas do you think will see new entrants?

**Seiji Kamiya:** Payment services from Japanese banks are terrible, a huge opportunity for any new entrant. The other is asset management. The industry is currently dominated by big banks and [non-bank] financial institutions. There are almost no independent asset managers that serve the individuals. New entrants might become the disruptive forces in these two industries.

## **How has the asset management industry evolved in Japan? Who are the successful new entrants?**

Independent asset management is quite small compared to large banks and financial institutions. But it leaves much room for the retail investment business. The use of mobile phones pushes the development of retail investment management in Japan. The investors can check their portfolios and reports on their own mobile phones. One of the leading players is Money Forward.

## **In other countries, robo-advice development has followed different paths, for example, some work with banks and financial institutions, some operate independently. What is the situation in Japan?**

The history of investment management in Japan is almost the history of pension funds and institutional investments. Few people in Japan invest privately. Most people choose to put the money in banks. Banks will transfer the money to the pension funds with investment professionals. In this ecosystem, Japan has large life insurance companies and pension trust funds, which is unique in the world. There are four major pension trust funds in Japan: Mitsubishi UFJ, Mizuho, Sumitomo Mitsui, and Resona, which happen to be large life insurers as well.

Besides, defined-contribution plans came into Japan 15 to 20 years ago with small and private investment management companies stepping into this area. They tried to educate Japanese investors to judge their investments independently. Unfortunately, it didn't work. Japanese investors just chose varied types of funds instead. Investors who chose liquidity funds at that time lost lots of money, which left them with bad memories. In the last two years, the liquidity fund market has seen tremendous growth since Donald Trump entered the White House.

The new mass market comprises users who are attracted by personalized services to meet their needs. Start-ups are offering the services by using FinTech to make a profit, though traditional financial institutions are attempting to keep pace with the change.

## **How about other areas?**

AI has great potential in the Japanese finance industry. The employees in the banks and financial institutions need to spend a long time in the office. At the first stage, most daily operations on the computer can be replaced by robotic automation applications. Mitsubishi bank is planning to introduce machine learning technology within the bank to streamline internal processes. Then, the banks or financial institutions are going to improve working efficiency and client experience with the help of machine learning or deep learning. An AI-based chatbot can replace most Q&A and compliance rule issues, which require a lot of manpower right now. Japanese banks and financial institutions are very conservative. They will choose to test the application internally before opening it to their customers. For example, MUFJ bank tested its MUFJ Coin within the bank first.

## **What is the stance of the regulators?**

Basically, regulators are supportive to non-bank players, although they need to take a more balanced approach in response to recent misconduct by the start-ups.

### **What do you think of the future of FinTech development in Japan?**

The young people and university students in Japan are different from their counterparts in other countries and regions, like the United States. More than 90% of them would prefer working for big companies to starting their own business. But we do see some changes. For example, some private universities, like Keio University, are opening courses to help students start their own business. These courses will teach the young generation how to apply new technologies in the business and how to start a new business. It can't be effective immediately but might bring some changes in the next five years in Japan.

# Singapore

# MAS PERSPECTIVE ON AI, BLOCKCHAIN, AND REGULATING FINTECH

An Interview with Sopnendu Mohanty,  
Chief FinTech Officer, Monetary Authority of  
Singapore

Larry Cao, CFA (interviewer)

Singapore is a major financial market in Asia. So its status as a FinTech hub for the region, and particularly for Southeast Asia is no surprise. Recently, Sopnendu Mohanty, chief FinTech officer of the Monetary Authority of Singapore (MAS), spoke with us about his view of the roadmap for potential AI and blockchain adoption in Singapore.

**What are the major trends in the FinTech world in general and in Singapore in particular that you are seeing?**

**Sopnendu Mohanty:** There is a shift in the architecture of the banking sector, from a closed-loop enterprise system to an open API-based architecture. The result is unbundled complexity into small modular pipes that can be plugged into large enterprise systems, so small companies can compete along with large companies.

Unlike other markets that have a lot of B2C [business-to-consumer] activities such as retail FinTech, Singapore, as a financial center, pays more attention to the B2B [business-to-business] area, which is infrastructure FinTech. Singapore is more concerned with changing the architecture of the financial sector and tries to create new opportunities to make financial services more efficient and inclusive and capture bigger possibilities.

**Let's start with artificial intelligence. How do you think AI will help transform the financial services industry in Singapore?**

Most AI applications are in two major categories. One is robotic process automation [RPA], which has emerged strongly. RPA is entering a mature stage within the business operation. Externally innovative extensions of AI (artificial intelligence), like pure AI-based data-analysis and identifying patterns or future possibilities, are still in a very early stage.

We have seen very good products in the compliance and fraud detection areas. But they are far from mature.

The Monetary Authority of Singapore figured out that the financial industry used artificial intelligence to transform its business primarily in efficiency and predictable activities, such as market monitoring and supervision. AI helps understand compliance rules and meet

regulatory requirements. The ultimate use of AI is looking for patterns through data. MAS's first rule on AI is to form a consistent policy on data and cloud computing that tries to make sure of the efficiency of implementation of AI. MAS is concerned with the availability of AI when real opportunities come along.

There is a shift from enterprise closed-loop systems to an open API-based system. In my opinion, Singapore is at the stage of low-hanging fruit. In terms of financial infrastructure, AI has a potential to improve efficiency from the front office to the back office. AI can analyze the business and virtually replicate much more sophisticated transactions.

### **What is the MAS policy regarding data?**

MAS has a fairly open data policy, and cloud computing guidelines. MAS has released new guidelines for financial institutions on risk management practices in outsourcing, which includes the use of cloud services for the first time. Our data policy has no constraint. MAS also has specific guidelines on privacy.

### **Which sector is the most productive in AI applications?**

Primarily, most use cases are in the compliance and risk management areas. AI is applied more in holding market position, market-conducted monitoring, and overseeing market bias, which helps to improve the efficiency of financial institutions.

### **Who offers the products? The FinTech start-ups, bigger technology companies, or financial institutions?**

They are represented in different ways. We realized that the shift of architecture in the financial sector is primarily influenced by cutting-edge FinTech companies. Driven by the new technology—API (application programming interface)—banks and financial institutions are opening their ecosystem. The shift from an enterprise system to an open API architecture provides equal opportunities for both large technology companies and FinTech start-ups to work with banks or FIs. It seems to break down the complexity into smaller parts. FinTech start-ups can be responsible for a specific product and plug it into a large enterprise through APIs. In the past, if one company wanted to sell something to a bank, it had to be deeply rooted in the bank's architecture.

### **Can you share some progress about MAS's efforts in blockchain?**

MAS is implementing a multi-year and multi-phase blockchain project called Ubin, which is currently at the third of a total of five stages. This project is to help us understand the value and opportunities related to blockchain technology and policymaking from the regulatory perspective.

MAS is implementing blockchain in four areas:

1. domestic and cross-border payment;
2. securities payment settlement;
3. eKYC; and
4. Global Trade Connectivity Network, which is a trade finance process between Hong Kong and Singapore on blockchain.

Once we are done with the use cases, we'll be very comfortable with the technology and hopefully be able to make a policy call on how blockchain may affect the economy.

### **Regulation is a major hurdle. How do the regulators typically approach a decentralized system?**

Decentralized financial institutions need trust in one another, which is not happening right now. But technology always surprises us. I think we will be surprised, though the institutional trust may be replaced by blockchain types of technologies. The centralized institutional trust will still be a viable public utility, and we could also have a decentralized data verification system on blockchain. The demand and reliance on the public utility will become less. But I don't think it will happen immediately. Blockchain is far from mature and still has a long way to go. However, we need to give time for blockchain to evolve.

### **How will the blockchain adoption evolve?**

Unlike AI, blockchain is about the infrastructure, which is much like the internet where you needed a global standard for data transmission. Different participants in the internet grew from different protocols to share the same language eventually. Similarly, MAS is building an institutional network as a global infrastructure and making policies on how different countries build their own networks. Blockchain development needs regulatory support.

Blockchain started as a public utility. For example, major financial centers are using blockchain to connect to each other for trade finance. Different players can be connected across the world and verify each other's national digital identities on blockchain. Thus, it builds trust among different parties. Once people rely on blockchain to move money, to do banking, to make payments or to trade, blockchain will become the internet of value. But at the current stage, blockchain is far from mature on the application level and there is a lack of policies at the infrastructure level. That is also the reason why the blockchain experiment needs a lot of meaningful jurisdictions to participate to see how far it can go.

### **Many people have doubts about blockchain's efficiency. How do you see it?**

Looking back at the history of technology, many new technologies, like computers [went] through an unrealistic and inefficient stage, especially at their initial stage. But it will eventually evolve and work out. The core of technology development is policy and adoption issues, not the efficiency.

### **What is the competitive advantage of blockchain?**

It is a huge cost for an enterprise, or even one country, to obtain data from the current financial infrastructure. Blockchain has the capability to remove the inefficiency in intermediaries. Blockchain is not solving a computing problem. It is solving a process problem, not the computing problem. Fantasy creates future. Hype creates hope.

### **What is your general perspective of sandbox?**

Sandbox is a method of policy- making through experimentation. Sandbox was primarily conceptualized in Singapore in a very different way than what happened in the United Kingdom, where it was most used in testing new products. In Singapore, it is designed for policy upgrades and looking for applicable experiment outcomes. Sandbox regulators should be closely in line with technology development to make faster policy changes in order to support new technologies.

# BANKING AND FINTECH: THE SINGAPOREAN APPROACH

## An Interview with Altona Widjaja

### Larry Cao, CFA (interviewer)

The banking industry's approach to FinTech in Singapore has always been of interest to many, for good reasons. Despite its small size, Singapore has been active in the pursuit of FinTech. In the CFA Institute report *FinTech 2017: China, Asia, and Beyond*, we shared insights from two DBS experts. This year, I had the opportunity to communicate with Altona Widjaja, vice president of Open Vault and OCBC, another one of the top banking institutions in Singapore. He shared with me his thoughts on AI (artificial intelligence), blockchain, and robo-advice.

#### **There's much interest around blockchain. Can you highlight some of the interesting developments/cases that you have seen in that space?**

**Altona Widjaja:** All eyes this year are on DLT [distributed ledger technology] implementation by Digital Asset holdings with the Australian Securities Exchange (ASX) to replace their post trade and clearing system; CHEER is planned to launch in 2018. This might be the first scalable production implementation for DLT in financial services. It will open up new possibilities for other applications in financial services.

At OCBC, we believe that DLT is able to embed Know Your Customer (KYC) information and enable DLT-based payment. Therefore, we have experimented in both areas and believe that the technology is ready. However, the challenge of deploying production system DLT still remains.

DLT/blockchain interoperability is still at a very early stage, which brings about the debate over which DLT protocol will be the dominant player and which will be used by any FSI [financial service institution].

#### **When do you see blockchain becoming more of a force in production systems (versus trials)? What are the challenges/hurdles? How do you anticipate that the industry will resolve these issues?**

As more key financial infrastructure projects go into production just like in the case of ASX mentioned above, there will be more players that will have the confidence and aligned interest to bring DLT into production. We can expect this to happen in a narrow use case in a couple of years.

There are two key challenges for any DLT project to move into production:

1. **Cost of switching:** Currently, each FSI has its own systems, and moving into a DLT-enabled system will not be a small investment. In order to reap the benefit of DLT, everyone has to replace their systems at the same time.

2. Market power: We need an institution like a regulator, an exchange, or a platform owner (e.g., JPM in transaction banking) that has the power to force other institutions to change their platform/systems and let everyone work hand in hand. An industry-driven approach might also work, but each of them will need to align their commercial interests.

**AI is also getting a lot of attention. Where are you seeing AI being put into action? More specifically, what use cases are you seeing for what type of AI technologies?**

AI will be fundamental in refining core banking processes and transforming the banking industry. It enables productivity enhancements by simplifying and optimizing traditionally lengthy and extensive activities and improves fraud detection by the bank. One example is an anti-money laundering machine-learning solution jointly developed by OCBC Bank and our FinTech partner Thetaray. It significantly reduced the volume of transactions reviewed by anti-money laundering compliance analysts and increased the accuracy rate of identifying suspicious transactions by more than four times.

Besides increasing operational efficiency, AI also enables the creation of new or more personalized offers by anticipating customer needs and changing the way we interact with customers, making it more natural and seamless. One example is OCBC's voice-enabled mobile banking app.

At OCBC, we are constantly looking to build the "Bank of the Future" that provides natural, frictionless, and personalized banking services to our customers. We envision banking as an ecosystem—ubiquitous and embedded in our customers' everyday life. Therefore, AI plays a crucial role in helping us leverage the rich data we already have in the bank as a core advantage and use data-centric models to achieve a competitive advantage. The setting up of Singapore's first AI lab of a bank—AI Lab@TOV—reinforces our vision and beliefs.

**What do you think is the role of robo-advisors? Where do they have an advantage over traditional financial advisors?**

Robo-advisory is expanding in the wealth management field. Robo-advisors will democratize access to wealth advisory to more potential investors due to the low minimum investment sum and low-cost portfolios.

It would appeal to a broader market segment, especially the more tech-savvy young professionals who prefer the ease of use and making their own wealth investment decisions to placing trust or control in human advisors.

The algorithm-driven robo-advisory system will also be able to assess and provide advice to more customers and spot better opportunities based on market data and customer's preferences gathered.

Automated processes like the application process eliminate friction for investors and reduce costs for banks.

**You mentioned that you are looking to launch two versions of robo-advisors this year. Can you elaborate on that? How are these different?**

We do have two ongoing robo-advisor proof-of-concept projects:

1. Direct to consumer robo: enabling the bank to provide wealth management advice to self-directed customers
2. Relationship manager assisted robo: enabling the relationship managers of the bank to provide better wealth advisory services to customers with detailed analysis of the customer's portfolio and projection simulation

**What do you think is the most effective approach for banks/other financial institutions to take in terms of FinTech? Why?**

The more common approaches are partnerships with FinTech companies or investment/acquisition, which is a longer-term play. At OCBC, we do not take stakes in our FinTech partners. Recognizing our core advantages as a bank and FinTechs' advantages, we co-innovate and co-develop solutions with them and become their customer when the successfully validated solutions go into production.

We are also actively establishing partnerships beyond FinTech such as with tech giants and other vertical institutions. We come together with these ecosystem partners to create new product propositions that will be able to better meet customer's needs. The ultimate goal is to create a closed ecosystem that covers every touch point of customer journeys.

However, in order to effectively work with FinTechs, banks have to change the way they work. We have to be nimble and adaptable in getting what our customers want. This means a fundamental shift in different aspects from operating model to culture and mindset.

# Thailand

# THAILAND FINTECH REVIEW

## An Interview with Jessada Sookdhis, CFA

### Larry Cao, CFA (interviewer)

Thailand ranked seventh in a survey of FinTech competitiveness in Asia at the end of last year. Earlier last year, I had the opportunity to sit down during the Thailand Investment Conference with Jessada Sookdhis, CFA, president of the Thai FinTech Association, to discuss what's unique in Thailand's FinTech development.

#### Can you give us an overview of Thailand's FinTech landscape?

**Jessada Sookdhis:** Unlike China and the United States, Thailand has a different ecosystem. There are around 100 FinTech start-ups in Thailand. However, the size of each start-up is relatively small. There is no big conglomerate, like Ant Financial in China.

Besides FinTech start-ups, commercial banks have already woken up. For example, Thailand's three major banks, Siam Commercial Bank, KASIKORNBANK, and Krungsri Bank, have set up their own FinTech labs with banking platforms and acceleration programs and also applied for many projects in the regulatory sandbox.

The most active areas are blockchain and robo-advice.

#### Who are the major players in the blockchain area in Thailand?

A few FinTech start-ups that focus on blockchain were set up. Besides, we also saw collaboration between the big conglomerates from other countries, like IBM, with Thai financial institutions. IBM works as a technology provider, as financial institutions have their own blockchain projects with in-house experts.

#### What areas are these blockchain applications in?

For the FinTech start-ups, their applications are mostly in cryptocurrency. Some of them focus on public blockchain projects. Others focus on private blockchain projects. For example, Omise, one of the largest FinTech start-ups in Thailand, focuses on solutions based on the Ethereum platform.

On the bank side, there are various blockchain applications to facilitate their customers for transactional banking, foreign exchange, and export/import transactions. Some applications have already been launched and some are still in progress.

### **How about developments in other areas?**

Robo-advice is also a highly active area. Start-ups are developing algorithm-based investment models and partnering with securities firms or brokerage houses to launch their models.

Robo-advice came to Thailand 3 to 4 years ago and has been well-received by Thailand investors. Moreover, robo-advice start-ups have strategies different from the incumbents. They provide retail investors with access to alternative investment assets in addition to stocks. Middle-class and even high-net-worth clients are the main users of robo-advice services.

### **How much potential do you think robo-advice has in Thailand?**

The investment market in Thailand is very underpenetrated, with only 6% or 7% of Thais already invested. However, potential investors here will not invest without human involvement. They need to find a guru or an influencer they trust to give recommendations, which generates a stronger impact in Thai markets than brands.

### **How do robo-advice platforms work with financial influencers?**

Robo advice platforms leverage financial influencers by using a combination of content and [speaking engagements]. The start-up called Finnomena invites famous financial influencers in Thailand to provide investment knowledge on the platform. The content created by the financial influencer helps the platform to gain a lot of attraction and trust from investors. Investors will follow the influencers' recommendations to choose investment models on the platform. The model invests in mutual fund products.

### **Who are the major users of this platform?**

Most of them are high-end retail investors. We also have 20 asset management clients. It is a B2B2C model. We offer free services for the retail customers and only collect commissions from the institutional clients.

### **What is the challenge for robo-advice in Thailand?**

The challenge is people's investment habits. Potential investors in Thailand still like to put money into deposits. There are only 5 million mutual fund accounts in Thailand, compared to 80 million deposit accounts. In the developed countries, the percentage is around 50-50. But I foresee there will be 20 to 30 million more mutual fund accounts in the future.





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