



2021 China Fintech 50 Report



毕马威中国未来50榜单系列
KPMG China Future 50 Ranking Series



金融科技
Fintech

KPMG China

February 2022

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Foreword



2021 was a significant year for fintech development in China as it was the final year of the People's Bank of China's (PBOC) *fintech Development Plan (2019-2021)*, and also the year in which the next Three-Year Plan was released. Based on the guidance provided by the *fintech Development Plan*, during the last three years, the "four beams and eight columns" of fintech have been basically formed, and the digital transformation of the financial sector has been accelerated. As the fintech industry ushers in a new stage of development, KPMG presents the 2021 China Leading Fintech 50 and Future 50 lists, which include 50 established companies that have been focusing on developing fintech for years along with 50 companies that have emerged more recently. 2022 marks the sixth consecutive year in which KPMG has published the China fintech 50. During this time, we have been pleased to witness the growth of so many outstanding fintech players. Going forward, we sincerely hope that the fintech industry will build an open, sustainable, scenario-based ecosystem under the guidance of national strategies that promote both prudent regulation and innovation.

Honson To

Chairman
KPMG China and Asia Pacific

Fintech development has been booming in recent years as various new business models and scenarios have emerged. At present, the industry needs to turn its focus back to the essence of technological services and use technologies to break through the pain points of traditional financial services. The digital "ABCD" technologies (artificial intelligence, blockchain, cloud computing, and big data) are making great progress and have laid the foundation for the development of fintech infrastructure. Currently, the financial sector needs technologies that are more effective, stable, secure and compliant; and striking a balance between financial stability and innovative development has become an important goal for fintech companies. For industry players, technological breakthroughs and collaborative innovation will drive the implementation of technologies in various scenarios, and promote the development of a robust fintech ecosystem in which security and compliance risks are under control. Meanwhile, technological developments such as the metaverse are presenting uncharted territory for fintech developers to explore.



Jacky Zou

Vice Chairman and Senior Partner,
Northern Region, KPMG China

Foreword



As financial technologies mature, they are being applied in all aspects of financial services. Meanwhile, under China's "dual circulation" strategy, consumption is being promoted, rural areas are being revitalised, and issues related to the country's ageing population are being actively addressed. In this context, understanding and meeting the consumer and financial needs of the "silver-haired" generation, small-town youth, Generation Z and urban middle class have become the key levers for identifying innovative fintech scenarios. At the same time, more e-CNY pilot programmes are being rolled out, and they are attracting significant user and transaction volumes. The formal launch of the e-CNY will reshape the country's payment system, and in the future the scope of the e-CNY will be expanded to new areas such as foreign exchange management and cross-border payment. The e-CNY will also facilitate the PBOC's ability to apply measures across multiple scenarios at the government, business and consumer levels, as well as scenarios involving agriculture, rural areas, farmers, education and smart cities. Going forward, the e-CNY will make fintech more inclusive.

Tony Cheung

Vice Chairman, Head of Financial Services
KPMG China

In our hundreds of visits to fintech enterprises across the country, we were impressed by how widely technological innovations are being applied to improve financial services for the real economy. In the green finance sector, blockchain technology is being used to effectively collect carbon source and carbon sink data, allowing enterprises to access green finance services more efficiently. In inclusive finance, technologies such as artificial intelligence (AI) are being applied to identify business scenarios and analyse the data of small and micro enterprises for the purposes of precise profiling; in this way, data assets are being converted into credit assets to address the financing difficulties of micro, small and medium-sized enterprises. Meanwhile, in the field of supply chain finance, based on their deep understanding of enterprises' businesses models and operations, fintech players are providing integrated financial service solutions to facilitate supply chain financing for different upstream and downstream industries. During this exciting time for innovation, financial industry participants should bear in mind that all of their financial activities must be fully regulated and licensed to ensure their fintech innovations are subject to prudent regulation and to guard against systemic financial risks.



Thomas Chan

Head of Financial Services Assurance,
KPMG China

01

Overview

2021 China Leading Fintech 50 and Future 50

Introduction

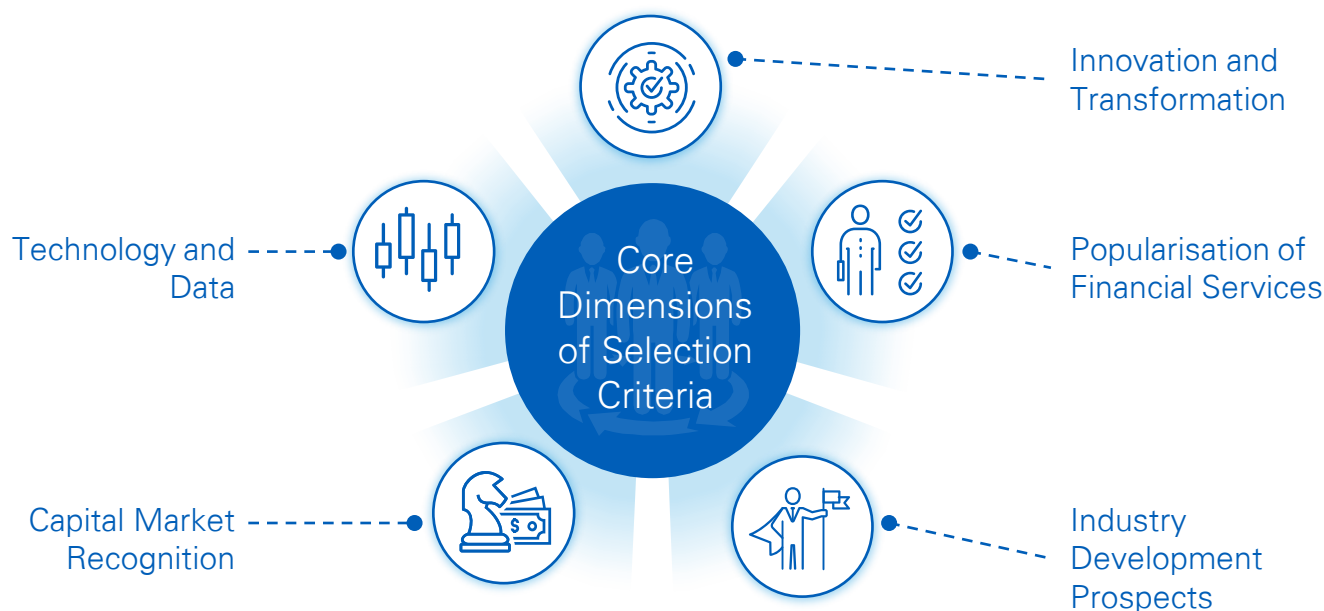
Since 2016, KPMG China has successfully launched five annual publications on China's leading fintech enterprises to publicise and promote fintech development in China. To continue strengthening the fintech ecosystem, KPMG China launched its sixth annual selection of China's leading fintech enterprises in July 2021. After months of appraisal and selection, we are pleased to release the 2021 China Leading Fintech 50 and Future 50 lists.

Composition of the Selection Committee

The selection committee comprised dozens of KPMG partners and directors who specialise in the fields of information technology, data, capital markets, venture capital, risk management, finance, macroeconomics and financial services.

Core Dimensions of Selection Criteria

The five core dimensions of the KPMG China fintech 50 selection process are:



KPMG has independently developed its Startup Insights Platform (SIP) Model, which combines the above-mentioned core dimensions to quantitatively evaluate enterprises from multiple dimensions including collaboration, technology, product, market and financing.

Note: The selection of the China Leading fintech 50 aims to increase the market's attention on technological innovation in the financial sector, promote industry exchanges, and advance the standardised development of fintech. It does not evaluate the compliance and investability of the participating companies, nor does it interpret any regulatory policies.

The Finalists' Fields of Expertise

Multi	百信银行 度小满 陆金所控股 LUFAX 苏宁金融 WeBank 微众银行 360数科 XW 新网银行
Wealthtech	帮你投 比财数据科技集团 Datayes! 通联数据 富途证券 HUND SUN 恒生 华锐金融技术 基煜基金 金斧子 金证股份 理财魔方 M 妙盈 老虎证券 NEW 小投邦 Tigerobo 虎博 熵简科技 迅策科技 盈米基金
Insurtech	白鸽宝 更懂百姓的保险 knowledge vision 凯泰铭科技 宏领科技 乐橙云服 灵犀科技 略比 更懂你的生意 云保 微保科技 小雨伞 全国首家保司直连 元保 YUANBAO TECH 一保一保 众安保险
Inclusive Technology	Dashu! 大数金融 东岸科技 大德信科 ICE KREDIT 冰融 即科集团 LEXIN 乐信 马上消费金融 萨摩耶云 三零云 浙里信 网商银行 WeLab 汇立集团 信用算方
Supply Chain Technology	道口金科 GLP 普洛斯金融 开鑫科技 联易融 天道宝信 WeShare 新分享 中证信用 中企云链
Payment Technology (Paytech)	Airwallex 数金金服 SUNRATE 寻汇 银联商务 壹钱包
Regtech & Suptech	AFOM 8 QME 前海联合交易中心 GTCOM QTRADE 妥妥妥 价值在线
Platform Technology Empowerment	金蝶信科 宇信科技 新希望金融科技 DCITS 神州信息 金融壹账通 HSBC
	百融云创 ChinaScope 数盾 氮信科技 达观数据 大地量子 云扩科技 来也 金智维 见知数据 商汤 云从科技
	WANXIANG BLOCKCHAIN 方向区块链 布比科技 众享比特 CLUSTAR 星云 中子星创投 洞见科技 cdc 云趣数科 云象 零数科技 质数斯达克
	金山云 SequoiaDB 巨杉数据库 优卡科技 中科驭数

List of 2021 China Leading Fintech 50 and Future 50 — Leading Enterprises

*The following enterprises are listed in "pinyin" alphabetical order

Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 360 DigiTech	 Beijing Qiyu Information Technology Co., Ltd.	 2021/2020/2019
 Airwallex	 Airwallex	 2021/2020/2019
 iYunBao	 Shanghai Baoyun Network Information Service Co., Ltd.	 2021
 WeLab	 WeLab Holdings Limited	 2021/2020/2019/2018/2017/2016
 Bairong, Inc.	 Bairong Yunchuang Technology Co., Ltd.	 2021/2020/2019/2018/2017/2016
 AIBANK	 CITIC AIBANK CORPORATION LIMITED	 2021/2020/2019/2018
 IceKredit	 IceKredit, Inc.	 2021/2020/2019/2018/2017/2016
 BUBIBIOCKchain	 Bubi (Beijing) Network Technology Co., Ltd.	 2021/2020/2019/2018/2017
 DataGrand	 Datagrand Information and Technology (Shanghai) Co., Ltd.	 2021/2020
 Du Xiaoman	 Du Xiaoman Technology (Beijing) Co., Ltd.	 2021/2020/2019/2018/2017/2016
 Futu Securities	 Futu Securities	 2021/2020/2019/2018/2017/2016
 HUNDSUN	 Hundsun Technologies Inc.	 2021/2020
 Tigerobo	 Tigerobo Network Technology (Shanghai) Co., Ltd.	 2021/2020/2019/2018

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 HSBC Technology China	 HSBC Software Development (Guangdong) Limited	 2021
 FOFUND	 Fofund Co., Ltd.	 2021/2020
 Kingdee Fintech	 Shenzhen Kingdee Internet Financial Services Co., Ltd.	 2021/2020/2019
 OneConnect	 OneConnect Financial Technology Co., Ltd.	 2021/2020/2019/2018
 Kingsoft Cloud	 Beijing Kingsoft Cloud Network Technology Co., Ltd.	 2021/2020
 Shenzhen Kingdom	 Shenzhen Kingdom Sci-tech Co., Ltd.	 2021
 KINGSWARE	 Zhuhai Kingsware Infotech Co., Ltd.	 2021/2020
 Laiye	 Beijing Laiye Network Technology Co., Ltd.	 2021/2020
 Tiger Brokers	 Tiger Brokers	 2021/2020/2018/2017/2016
 Lexin	 Shenzhen Lexin Software Technology Co., Ltd.	 2021
 Linklogis	 Linklogis Inc.	 2021/2020/2019
 Lufax Holding	 Shanghai Lujiazui International Financial Asset Exchange Co., Ltd.	 2021/2020/2019/2018/2017/2016
 MSXF	 Mashang Consumer Finance Co., Ltd. (MSCF)	 2021/2020/2019/2018/2017/2016

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Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 PingAn eWallet	 Ping An e-Wallet e-Commerce Co., Ltd.	 2021/2020/2019
 QME	 Qianhai Mercantile Exchange	 2021/2020
 Samoyed Cloud	 Samoyed Cloud Technology Group Holdings Limited	 2021/2020/2017
 Sanbaiyun	 Nanjing Three Hundred Cloud Information Technology Co., Ltd.	 2021/2020/2019
 SenseTime	 Shanghai SenseTime Intelligent Technology Co., Ltd.	 2021
 DCITS	 Digital China Information Service Company Ltd.	 2021/2020
 XW Bank	 Sichuan XWBank Co., Ltd.	 2021/2020/2019
 Suning Finance	 Shanghai Suning Financial Service Group Co., Ltd.	 2021/2020/2019/2018
 Datayes	 Datayes Inc.	 2021/2020/2019/2018/2017
 Wanxiang Blockchain	 Shanghai Wanxiang Blockchain Inc.	 2021/2020/2019
 Chinavbao	 Beijing Chinavbao Technology Co., Ltd.	 2021
 WeBank	 WeBank Co., Ltd.	 2021/2020/2019/2018/2017/2016

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Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 The Umbrella Insurance	 The Umbrella Insurance Broker Co., Ltd.	 2021/2020/2019/2018
 XWFintech	 Chengdu XWFintech Co., Ltd.	 2021/2020
 XYSL	 XYSL	 2021/2020/2019/2018
 ChinaUMS	 China UnionPay Merchant Services Co., Ltd.	 2021/2020
 Yingmi Fund	 Zhuhai Yingmi Fund Service Co., Ltd.	 2021/2020/2019
 Yusys Technologies	 Beijing Yusys Technologies (Group) Co., Ltd.	 2021/2020
 CloudWalk	 CloudWalk Technology Co., Ltd.	 2021
 Zhongqiyunlian	 Zhongqiyunlian (Beijing) Financial Information Service Co., Ltd.	 2021
 GTCOM	 Global Tone Communication Technology Co., Ltd.	 2021/2020/2019
 CSCI	 China Securities Credit Investment Co., Ltd.	 2021/2020/2019
 ZhongAn Insurance	 ZhongAn Online P&C Insurance Co., Ltd.	 2021/2020/2019/2018/2017/2016
 PeerSafe	 Beijing PeerSafe Technology Co., Ltd.	 2021/2020/2019

List of 2021 China Leading Fintech 50 and Future 50 — Emerging Enterprises

*The following enterprises are listed in "pinyin" alphabetical order

Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 Atom 8	 Force Fintec	 2021
 Baigebao	 Baigebao (Xiamen) Insurance Brokers	 2021
 Bangnitou	 Vanguard Investment Advisors (Shanghai) Investment Consultancy Co., Ltd.	 2021
 Beijing Kuaique	 Beijing Kuaique Information Technology Co., Ltd.	 2021
 Bicai Group	 Bicai Data Technology Group	 2021
 TaoCloud	 Shenzhen TaoCloud Technology Ltd.	 2021
 TerraQuanta	 Beijing TerraQuanta Technology Co., Ltd.	 2021/2020
 Dashu Financial	 Shenzhen Qianhai Dashu Financial Services Co., Ltd.	 2021/2020
 DaoKou Fintech	 Beijing Daokou Jinke Technology Co., Ltd.	 2021/2020
 Dingran Technology	 Shenzhen Dingran Information Technologies Co., Ltd.	 2021
 Dongan Technology	 Zhejiang Dongan Technology Co., Ltd.	 2021
 Insightone	 Insightone Tech Co., Ltd.	 2021
 Hongling Tech	 Beijing Hongling Technology & Development Co., Ltd.	 2021

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Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 ArchForce	 ArchForce Financial Technology Company	 2021/2020
 Geex Finance	 Shanghai Geex Finance	 2021
 Value Online	 Shenzhen Value Online Information Technology Co., Ltd.	 2021/2020/2019
 Xencio	 Xencio Data Technology (Shanghai) Co., Ltd.	 2021
 Jinfuzi	 Shenzhen Golden Axe Network Technology Co., Ltd.	 2021/2020/2019/2018/2017/2016
 SequoiaDB	 Guangzhou Sequoia Software Development Co., Ltd.	 2021
 Kaixin Technology	 Kaixin Financial Technology Co., Ltd.	 2021/2020
 KTM Tech	 Kaitaiming Technology (Beijing) Co., Ltd.	 2021/2020
 Craiditx	 Shanghai CraiditX Technology Co., Ltd.	 2021
 Lechengyunfu	 Shenzhen Xiaobu Runpao Technology Co., Ltd.	 2021
 Licaimofang	 Beijing Koudai Caifu Information Technology Ltd.	 2021/2020
 Ideacome	 Ideacome Technology Co., Ltd.	 2021/2020/2016
 Oshu	 NengLian Tech Ltd.	 2021

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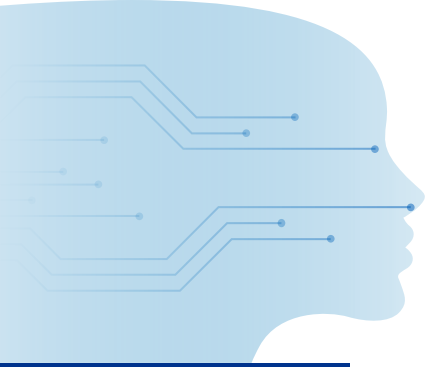
Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 MioTech	 MioTech	 2021/2020/2019/2018
 NewBanker	 Beijing Niutoubang Technology & Consulting Co., Ltd.	 2021/2020
 GLP Financial Services	 GLP Financial Holding (Chongqing) Co., Ltd.	 2021/2020
 Value Simplex	 Beijing Value Simplex Technology Co., Ltd.	 2021
 Shujin Public Service	 Shujin Public Service (Qingdao) Co., Ltd.	 2021
 ChinaScope	 ChinaScope (Shanghai) Company	 2021/2018/2017/2016
 Tiandao Fintech	 Tiandao Fintech Co., Ltd.	 2021/2020
 Totodi	 Sichuan Totodi Technology Co., Ltd.	 2021
 Weiyen Tech	 Shenzhen Weiyen Technology Co., Ltd.	 2021/2020
 WeShare	 WeShare (Shenzhen) Ltd.	 2021/2020
 Clustar	 Clustar Technology Co., Ltd.	 2021/2020
 SUNRATE	 Sunrate Solutions Limited	 2021/2020/2019/2018

List of 2021 China Leading Fintech 50 and Future 50 — Emerging Enterprises

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Short name of enterprise	Full name of enterprise	Years in which the enterprise was shortlisted
 XUNCETECH	 Shenzhen Xunce Technology Limited	 2021/2020
 Youka	 Chengdu Youka Information Technology Co., Ltd.	 2021
 Yuan Bao Insurance	 Yuan Bao Insurance Technology	 2021
 YUANBAO TECH	 Beijing Yuanbao Technology Co., Ltd.	 2021
 ENCOO	 Shanghai ENCOO Technology	 2021
 YQHaaS	 Hangzhou Qulian Technology Co., Ltd.	 2021
 Yunphant	 Hangzhou Yunphant Network Technology Co., Ltd.	 2021
 Zhelixin	 Zhejiang Zhelixin Credit Investigation Co., Ltd.	 2021
 Knowledge Vision	 Chengdu Knowledge Vision Technology Co., Ltd.	 2021
 HashSTACS	 Chengdu HashSTACS Technology Co., Ltd.	 2021
 Yusur Technology	 YUSUR Technology Co., Ltd.	 2021
 Zhongzixing Finance	 Beijing Weixing Youcai Network Technology Co., Ltd.	 2021

Overview

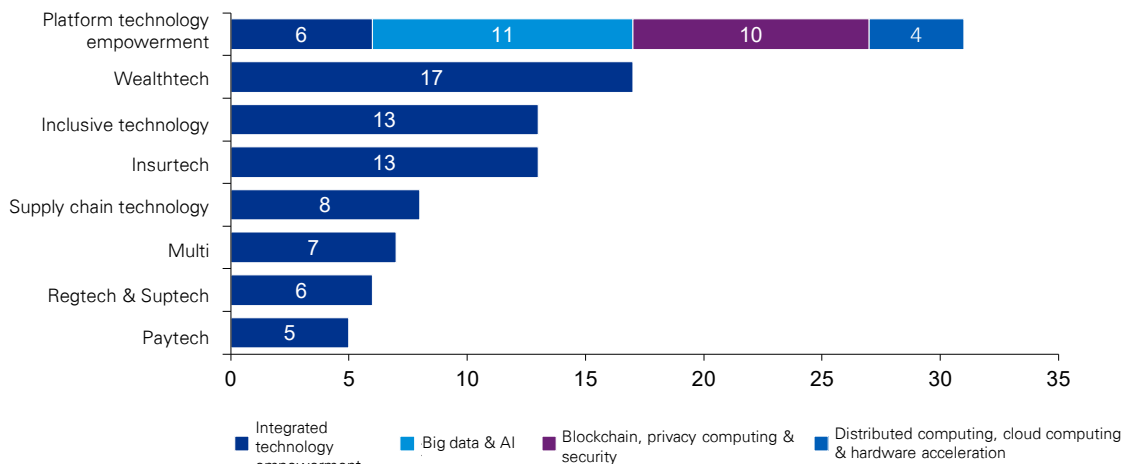


01

Distribution of areas of expertise: The fintech industry is composed of diverse market segments, with platform technology empowerment and Wealthtech ranking first and second, followed by Inclusive Technology and Insurtech (tied for third)

In terms of the areas of expertise of the selected companies, platform technology empowerment and Wealthtech enterprises ranked first and second in 2021, followed by Inclusive Technology and Insurtech (tied for third). These areas accounted for 31 percent, 17 percent, 13 percent and 13 percent of the selected companies respectively. In order to highlight how fintech is returning to the basics of technological services and showcase the achievements of the selected companies, we divided the Platform Technology Empowerment sector into four sub-segments: integrated technology empowerment; big data and AI; blockchain, privacy computing and security; and distributed computing, cloud computing and hardware acceleration. Within the platform technology empowerment segment, the sub-segments of big data and AI, and blockchain, privacy computing and security ranked first and second, highlighting the role of big data, AI and blockchain as leading infrastructure technologies.

Distribution of expertise areas



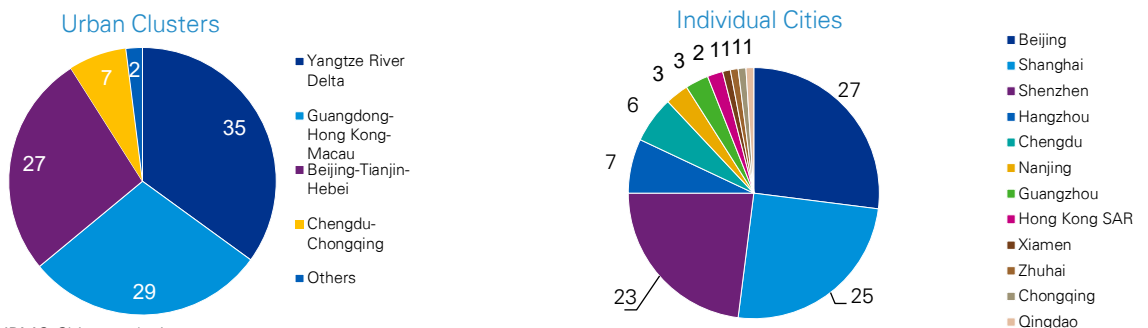
Source: KPMG China analysis

02

City and regional distribution: Beijing, Shanghai and Shenzhen remain at the top of the list, demonstrating a strong clustering effect

Beijing, Shanghai and Shenzhen are still where most of the selected companies are set up (75 percent), but this figure fell 7 percentage points compared to 2020. Meanwhile, cities like Hangzhou and Chengdu have been catching up as they become more attractive in the eyes of promising fintech enterprises. Geographically, almost all enterprises are located in the top five city clusters earmarked for priority development in the 14th Five-Year Plan. Overall, 91 percent of the enterprises are located in the Yangtze River Delta, Guangdong-Hong Kong-Macau Greater Bay Area, and Beijing-Tianjin-Hebei City Cluster, five percentage points below the 2020 figure. As a focal point of development in southwestern China, the Chengdu-Chongqing City Cluster stood out in 2021 as it notched 7 companies on the list, over twice the number it had in 2020.

2021 distribution where enterprises are located (percent)



Source: KPMG China analysis

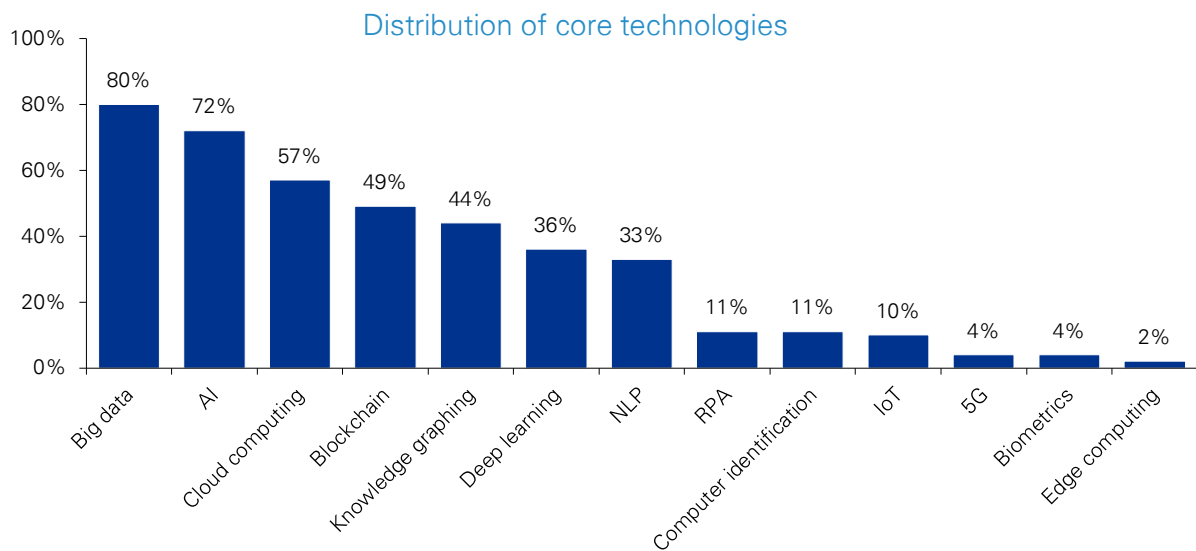
Overview



03

Distribution of core technologies: ABCD technologies (AI, blockchain, cloud computing and big data) are still the core fintech technologies

Similar to 2020, ABCD technologies are still the most important core technologies for fintech enterprises. We should note that the percentage of companies that cited blockchain as a core technology rose to 49 percent in 2021 compared to 34 percent in 2020, as richer blockchain scenarios in finance attracted more attention to blockchain development during the year. In addition, knowledge graphing, deep learning and natural language processing (NLP) were listed as core technologies by more than 30 percent of companies, showing that the industry is becoming more technology-intensive.

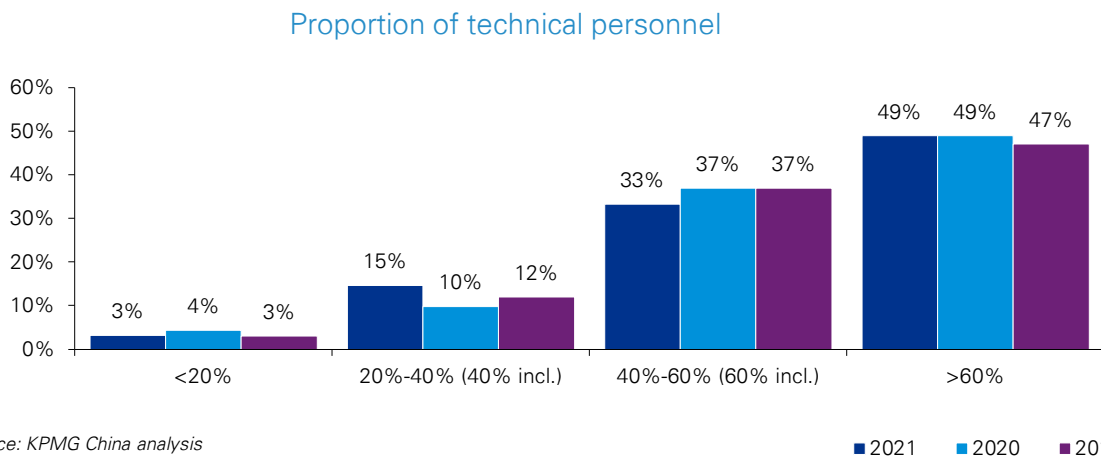


Source: KPMG China analysis

04

Proportion of technical personnel: The companies' headcounts include a high percentage of technical fintech personnel

Percentage of technical personnel has become a key indicator for measuring the innovative capability of a fintech enterprise. In line with the previous years' results, the selected companies maintained a high percentage of technical personnel in 2021. Specifically, 82 percent of the enterprises had more than 40 percent technical personnel, and 49 percent of the enterprises maintained a technical personnel percentage of above 60 percent.



Source: KPMG China analysis

■ 2021 ■ 2020 ■ 2019

Overview

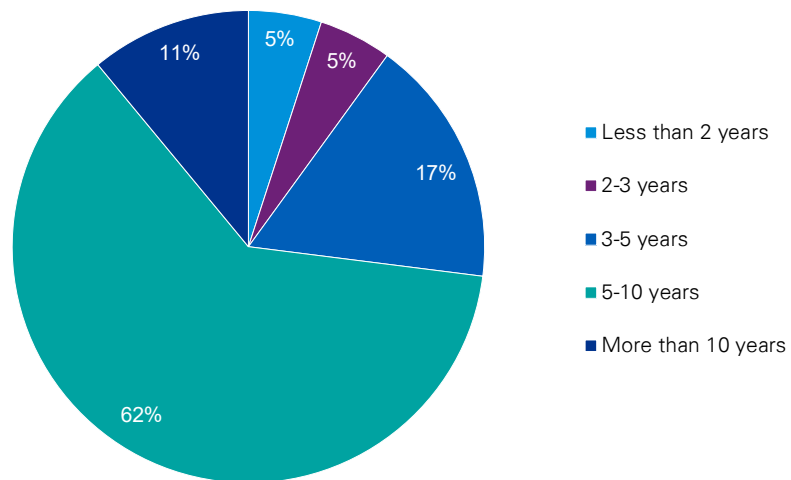


05

Distribution of years since establishment: Over 50 percent of enterprises have been established for more than 5 years

In terms of years since establishment, 73 percent of the selected companies have been established for more than 5 years, and 11 percent have been established for more than 10 years. This year's findings show that mature enterprises are reaping the fruits of their years of hard work as the percentage of enterprises established for more than 5 years increased substantially from the 38 percent figure that was recorded in 2020.

Distribution of years since establishment



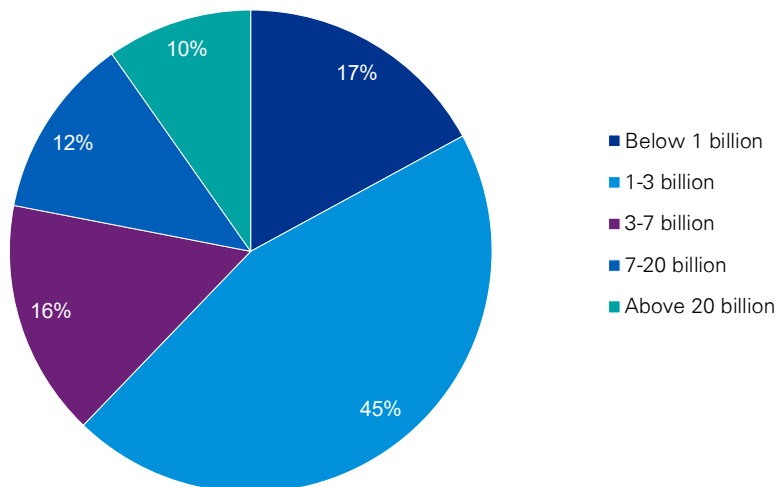
Source: KPMG China analysis

06

Distribution of estimated value: The estimated value of nearly half of the selected companies ranges from RMB 1 billion to RMB 3 billion

In 2021, the percentage of selected companies with an estimated value ranging from RMB 1 billion to RMB 3 billion increased to 45 percent compared to 35 percent in 2020, while the percentages of the other estimated value ranges remained basically unchanged. These findings show that while the industry is led by a few large enterprises, most of the market consists of small and medium-sized companies.

Distribution of estimated value



Source: KPMG China analysis

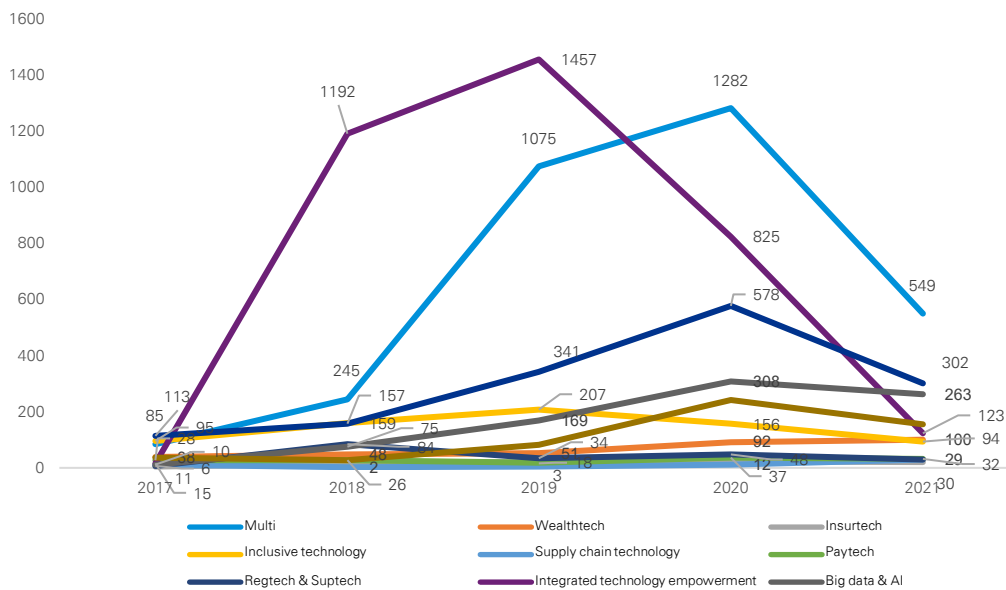
Overview



07

Patent application trends: Due to the impact of COVID-19, patent applications in the fintech industry declined considerably

In 2021, the number of patent applications submitted in most fintech segments declined, which can be attributed to the long research and development (R&D) cycle for patents and the postponement or suspension of R&D initiatives following the outbreak of COVID-19.



Source: KPMG China analysis

08

Tag cloud of patent titles: The fintech industry is focusing its technological R&D on data security

According to our tag cloud analysis of patent titles, information push, data transmission, data storage, data monitoring and data query were the most popular tags for patent titles. The term “data” appeared more frequently in 2021 compared to 2020, and tags such as blockchain, node, data, image and user became more popular. These trends highlight the importance that the fintech industry attached to digital security in 2021, as well as the fact that the industry is focusing more of its R&D efforts on data security.

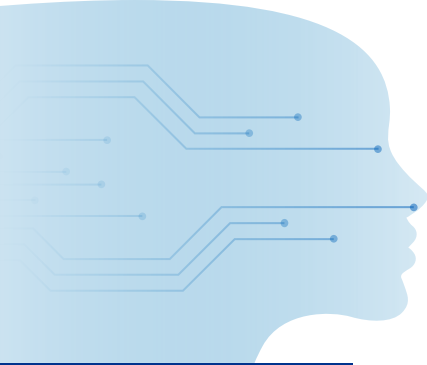


Source: KPMG China analysis

02

Trends and Prospects

The fintech Ecosystem in 2021: Trends and Prospects



Fintech is returning to the basics of technology to boost the financial sector and promote the high-quality growth of the real economy

Finance is the lifeblood of the real economy, and the real economy is the ultimate driver of the financial sector's development. Fintech, in the most basic sense, uses innovation to break two major pain points—"information mismatch" and "high transaction costs"—and promote the development of the real economy, consumption and industrial upgrading. In recent years, fintech development has been booming as various new business models and scenarios have emerged. However, at the end of the day, fintech still aims to enhance market efficiency and rationally allocate the factors of production, with the ultimate goal of better serving the real economy.



By translating data assets into credit assets, technology is driving the growth of "technologically advanced" small and micro enterprises

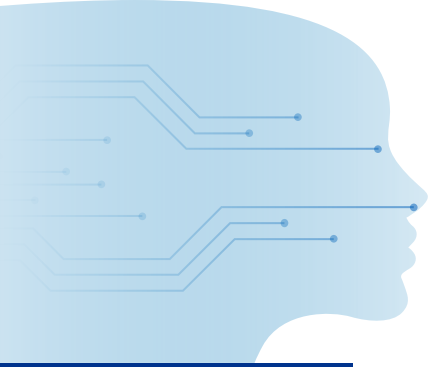
Thanks to strong policy support, small and micro financial business has been developing rapidly in recent years, but many financial institutions still face a difficult choice between either cutting the cost of this business and losing control over credit quality, which leads to a rise in non-performing loans; or focusing on asset quality and accepting higher operating costs. Going forward, technological breakthroughs in fintech represent the best path toward alleviating the financing difficulties of small and micro enterprises. First, technologies such as AI should be applied to identify various scenarios and analyse the data of small and micro enterprises in order to conduct precise profiling. Banks and other financial institutions can then use these data assets to better evaluate different enterprises' operations and business risks. Second, financial institutions should optimise their credit risk control models to improve the matching and efficiency of small and micro credit transactions and reduce operating costs.



Technological innovation is being introduced into every aspect of financial services in order to reduce transaction costs

Financial transaction costs mainly consist of customer acquisition costs, risk assessment costs, operating costs and capital costs. Technology has fundamentally changed the way that people access financial services while also reducing customer acquisition costs for financial institutions. Technology has also improved financial service models by automating manual processes and overhauling financial infrastructure. Overall, technology's ability to lower costs, raise efficiency and redefine the boundaries of financial services is bringing significant changes to financial products, service channels, service methods, risk management, credit financing, and investment decision-making.

The fintech Ecosystem in 2021: Trends and Prospects



IT innovation in financial service sector ensures the security of the fintech ecosystem

Information technology (IT) innovation refers to the innovation of IT applications. Among all industries, the IT industry is best positioned to serve the financial industry.



IT innovation in financial service sector ensures the security of the entire financial sector, which is important for long-term national security

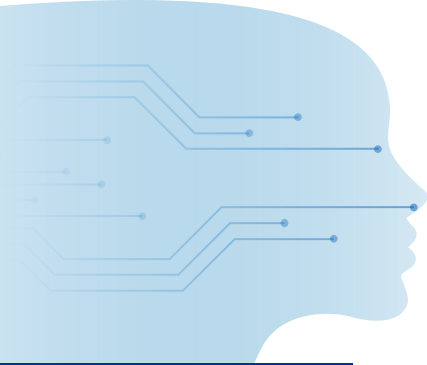
The key to IT innovation is to promote the use of domestically made IT infrastructure and replace foreign infrastructure components with domestic hardware and software. In this way, we can solve the “stranglehold” issue with respect to foreign control of key financial technologies and ensure the security of the entire financial sector. As banks are the foundation of the financial sector, they require core systems and other business systems with strong capabilities in terms of stability, continuity, and operability. One of the focuses and difficulties in financial IT innovation involves the high maintenance and repair costs and the long upgrade cycle associated with China’s reliance on imported mainframes and databases. Against this backdrop, the banking sector has already started leveraging distributed infrastructure and IT innovation to upgrade and reshape its IT infrastructure, including software and hardware, resulting in strong IT investment growth across the industry.



IT innovation in financial service sector moved into the fast lane in 2021

The People's Bank of China (PBOC) has finished setting up its laboratory for IT innovation in financial service sector, which covers operating systems, databases, blockchain, AI, security technology and smart counters; and the laboratory has been adjusted at the technical level to ensure it can be used by various institutions, including banks and technology enterprises. As one of its key projects, China’s *14th Five-Year Plan* calls for financial institutions to replace their systems from the outside in until their core business systems are replaced. By capitalising on their extensive experience using technology to serve financial institutions, fintech players can help financial institutions address challenges around key technologies and localisation, and play an important role in promoting financial IT innovation.

The fintech Ecosystem in 2021: Trends and Prospects



03

Multi

Enterprises should embrace regulation and build an open, sustainable, scenario-based fintech ecosystem

As fintech matures, it is reshaping traditional financial business processes such as bookkeeping, customer acquisition, processing and analysis. Going forward, technology companies and traditional financial institutions alike need to re-position themselves in this new ecosystem to ensure that they can develop successfully in the future. That being said, the rapid development of the industry poses challenges in certain respects.



An open financial ecosystem should unlock closed scenarios and ensure that financial data can be shared in a trusted and secure environment

As an extension of open banking, an open financial ecosystem is a platform-based model for financial development. The ecosystem creates new value from financial services by promoting the sharing of data, algorithms, transactions, processes and business functions between entities in the ecosystem. Large fintech enterprises will play an indispensable role in open and scenario-based finance as they have the unique advantage of having access to diversified scenarios and a huge amount of data from “long tail” customers, as well as the data, scenarios, technologies and models required for risk control. As China continues to strengthen anti-monopoly supervision, large technology companies have started to develop scenarios around payment interconnection.



Fintech empowers scenario-based finance and financial innovation to serve households and enterprises

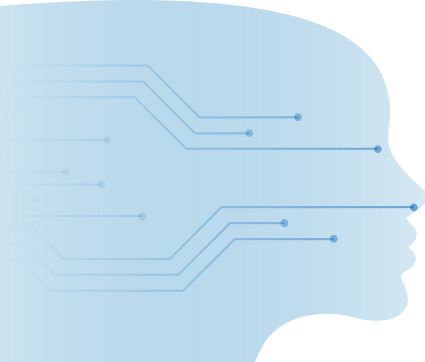
On the consumer side, significant policies are being rolled out to boost consumption, revitalise rural areas and respond proactively to issues related to the ageing population. In this context, understanding and meeting the consumer and financial needs of the “silver-haired” population, small-town youth, Generation Z and urban middle class have become the key levers for identifying innovative fintech scenarios. On the business side, small and medium-sized enterprises may find themselves at a disadvantage with respect to financing costs, bargaining power and cash flows, so the key to meeting their needs is to provide inclusive, end-to-end financial services through scenarios and platforms. In addition, as China pursues its carbon peak and neutrality goals, fintech tools are being widely used in ESG investment and financing, national carbon trading, green construction, green consumption, and green agriculture, so the scenario-based development of green finance will be an important trend going forward.



Traditional financial institutions are stepping up digital transformation, presenting challenges to fintech players operating across multiple segments

Technology companies have the first-mover advantage when it comes to seamlessly integrating financial services with non-financial scenarios, but trends in the fintech regulatory environment are providing commercial banks with the opportunity to catch up. As a result, large and medium-sized banks are establishing fintech subsidiaries, departments and research centres to boost their fintech investments. Compared to technology companies, traditional financial institutions like banks have been serving the financial sector for years, so they already have extensive branch networks, large volumes of real-name customer data, customer loyalty, rich financial operations experience, and robust risk management systems. As major participants in the fintech market, technology companies and traditional financial institutions can work together while also competing with each other.

The fintech Ecosystem in 2021: Trends and Prospects



04

Wealthtech

Technology is diversifying wealth management methods to suit the needs of customers at different income levels

As direct financing grows in popularity and the capital market opens up further, new opportunities are arising in the field of wealth management. In recent years, fintech innovations such as financial planning software, portfolio management software, digital platforms, and robotic process automation (RPA) have introduced disruptive changes to the wealth management sector.

Technology is diversifying wealth management methods and revitalising the existing “long tail” wealth management market

Technologies such as 5G, Internet of things (IoT), cloud computing, and virtual reality (VR) are raising the operating efficiency of wealth management firms, promoting synergies between front, middle and back offices, and enabling efficient online services for customers. Going forward, fintech developers and wealth management firms should harness the power of AI, big data, biometrics, RPA and other technologies to precisely profile customers, gain insight into customer needs, innovate financial products, intelligently allocate assets, and provide effective and convenient wealth management services. For example, automated asset allocation is attractive to “long tail” customers (the large affluent class with lower total investment needs) due to its low fees and accessibility, resulting in the revitalisation of a segment that has been overlooked by the traditional financial market.

The diversified demands of high-net-worth individuals and the fragmentation of the wealth management industry are accelerating the development of turnkey asset management platforms

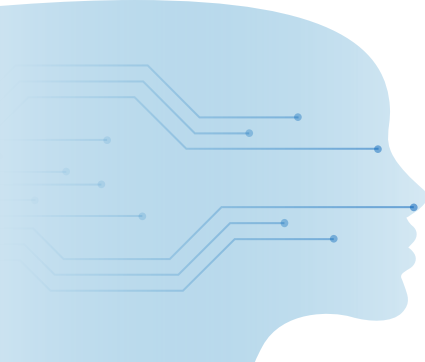
High-net-worth individuals have more diversified demands in terms of investment channels and goals, and they need highly customised and professional services across various processes, including asset allocation and post-investment management. As market demand grows, wealth management talents in China are speeding up their plans to start their own businesses, and the accelerated fragmentation of the market is presenting opportunities for turnkey asset management platforms (TAMPs).

Household wealth allocations are diversifying as equity assets become more attractive

In recent years, regulators have released various policies to enforce the “houses are for living in, not for speculation” principle and curb loans to real estate enterprises, with the goal of discouraging the use of real estate as an investment tool. As a result, financial assets are becoming a more attractive investment option for households. Going forward, the *Guiding Opinions on Regulating the Asset Management Business of Financial Institutions*¹ will abolish guaranteed repayment; direct financing will grow more popular; and the capital market will continue to develop rapidly. In this context, households will allocate more of their wealth toward equity assets, and Wealthtech will be widely applied throughout the asset allocation process.

¹ *Guiding Opinions on Regulating the Asset Management Business of Financial Institutions*, The State Council The People's Republic Of China, April 2018, http://www.gov.cn/gongbao/content/2018/content_5323101.htm

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Insurtech

Innovation-driven digital transformation and supply-side reform are ushering in new opportunities in the digital economy

The guidance of China's 14th Five-Year Plan and the evolution of insurance clients are accelerating the digital transformation of the insurance sector. Going forward, research investments in innovative Insurtech will become an even greater driver of digital transformation.

From “product-oriented” to “customer-oriented”: continuous innovation in the insurance sector

In the digital economy, a new generation of customers represented by Generation Y have become the driving force of the consumer market. Members of Generation Y are financially savvy and risk aware, and they represent the next insurance client base. This younger cohort is more receptive to online and digital services, and their behaviour and preferences should guide insurers in their effort to develop innovative services and optimise insurance products. The insurance industry's traditional concept of “product-oriented” services no longer meets customer demands for more personalised and customised services. To better serve younger customer groups, insurers need to optimise the types of insurance products that they offer, provide digital and online services, develop practical scenarios and apply innovative technologies.

Insurers are harnessing the power of technology to shift from covering multiple scenarios to covering all scenarios

At present, insurers are using technology to reduce service costs and develop new types of insurance products, such as auto insurance based on smart car IoT and life insurance based on smart home IoT. The widespread application of technology will give rise to a range of innovative insurance products that are suited to new demands and scenarios, such as cybersecurity insurance based on big data and cloud computing, digital asset insurance based on blockchain technology, and pet health insurance based on 5G IoT. With the help of Insurtech, the insurance sector will transition from covering multiple scenarios to covering all scenarios, resulting in a change in the overall structure of insurance product types.

The regulatory system is maturing and playing the dual role of “supervisor” and “facilitator”

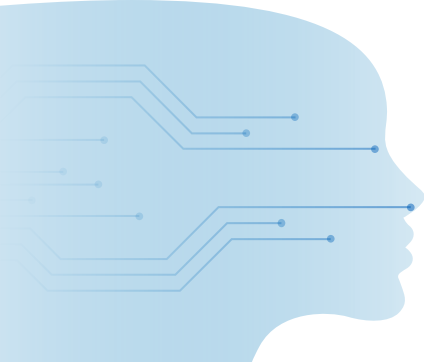
Over the last two years, Insurtech has been widely applied in traditional business processes, and the insurance industry and its ecosystem have been continuously evolving. In response, the China Banking and Insurance Regulatory Commission (CBIRC) introduced the *Regulatory Provisions on Insurance Agents*², the *Measures for the Regulation of Internet Insurance Business*³ and other rules to better supervise and regulate Internet insurance business. Meanwhile, the Insurance Association of China has released supporting policies such as the *Exclusive Commercial Insurance Terms of New Energy Vehicles (2021 Draft Exposure)*⁴ to improve industry policies and encourage digital transformation and service innovation. In this way, regulators are acting as both “supervisor” and “facilitator” to ensure the balance and health of the insurance ecosystem.

² *Regulatory Provisions on Insurance Agents*, The State Council The People's Republic Of China, November 2020, http://www.gov.cn/zhengce/zhengceku/2020-11/24/content_5563685.htm

³ *Measures for the Regulation of Internet Insurance Business*, The State Council The People's Republic Of China, December 2020, http://www.gov.cn/zhengce/zhengceku/2020-12/14/content_5569402.htm

⁴ *Exclusive Commercial Insurance Terms of New Energy Vehicles (2021 Draft Exposure)*, Insurance Association of China, August 2021, http://www.iachina.cn/art/2021/8/4/art_24_105269.html

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Enterprises should develop technologies that strike a balance between inclusiveness and innovation to help revitalise rural areas, promote sustainable development, and access a “blue ocean” of opportunity



To promote the development of inclusive technology, enterprises should balance financial stability and innovation, and the roles of market participants should be clearly defined

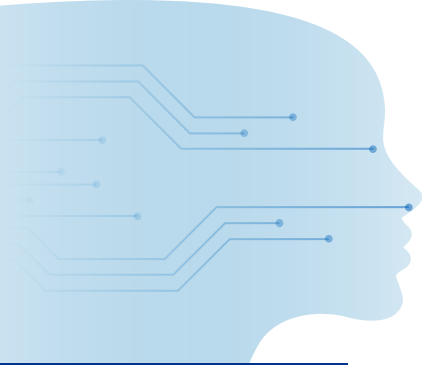
As platform enterprises and fintech subsidiaries enter the market, inclusive technology in China is becoming increasingly mature, and market participants are collaborating to develop innovative products and technologies that promote the development of inclusive finance. During the development process for inclusive technology, however, market participants should be careful to maintain robust financial development while also striking a balance between regulation and risk. Using the “regulatory sandbox,” the industry should focus on supporting the secure use of innovative technologies, defining the positioning of various types of institutions, dividing roles and responsibilities, and raising risk awareness during the cooperation process. Going forward, defining various institutions’ rights, responsibilities and boundaries and removing barriers to cooperation will be key to the successful development of inclusive technology.



Rural revitalisation and other types of sustainable development represent a “blue ocean” for inclusive technology

The introduction of fintech into all aspects of financial services has given rise to new scenarios for the use of inclusive technology, and rural finance is a particularly promising area in this regard. In response to the call to promote domestic circulation, infrastructure that supports the digital economy, including 5G, big data, AI, and the Internet, is being improved in rural areas, and the rural financial service system is being strengthened as well. As a result, rural financial services are increasingly digitalised, and financial institutions can now accurately analyse and integrate the multi-dimensional data of agricultural enterprises in order to precisely identify target customers. In this way, financial institutions are serving the “agricultural industry, rural areas and farmers” while also raising efficiency and strengthening risk control.

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Supply chain
technology

Blockchain effectively solves various pain points in supply chain finance, and promotes industrial development and the formation of ecosystems

The global outbreak of COVID-19, coupled with various anti-globalisation movements, has presented significant challenges to global supply chains, and some domestic enterprises have even been forced to shut down for the time being. In this context, supply chain finance is playing a pivotal role in resolving the financing difficulties of micro, small and medium-sized enterprises and promoting the stable development of supply chains. The *2021 Report on the Work of the Government*⁵ calls for “innovation of supply chain financial service models,” which many see as a necessary step for China to address significant changes in the global environment. As fintech becomes more widely used, significant advances are being made in the development of industrial Internet platforms and intelligent supply chain finance, providing the financial sector with the means to more effectively serve the real economy.



Fintech is helping supply chain finance develop in the direction of specific industry segments

Technology-based supply chain finance should take into account the characteristics and needs of each industry, so that supply chain finance develops in a way that is more segmented, precise and professional. For instance, large commercial banks have started developing integrated upstream and downstream financial services for industries such as dairy and agriculture. Going forward, fintech firms need to gain a solid understanding of the business models and operational logic of their target industries in order to provide supply chain finance solutions that are truly effective.



Blockchain technology is solving various pain points in supply chain finance

Historically, supply chain finance has been plagued by various challenges, including large numbers of participants, interrelated participants and processes, and difficulties related to the identification of transaction scenarios. To address these issues, blockchain and electronic certificates can be used to connect participants in the supply chain and establish an alliance that includes upstream and downstream entities, finance companies, financial institutions, banks and other trade finance participants. Enterprises can use these technologies to digitalise assets such as accounts receivable, bills and warehouse receipts, and credit can then be granted to suppliers at different levels of the supply chain. In this way, blockchain can reduce financing costs and enhance capital efficiency across the entire supply chain.



Technology is decentralising supply chain finance and promoting industrialisation and the development of ecosystems

The scope of an industrial chain is larger than that of a supply chain as it covers a larger swath of the economy. An industrial chain is essentially a cluster of enterprises that are internally connected, and it comprises a value chain, enterprise chain and space chain, in addition to a supply chain. As fintech matures and industry and finance become more integrated, supply chain finance is becoming more industrialised and ecosystem-oriented. In the future, this new business model will subvert the traditional “core enterprise” supply chain model and gradually lead to the development of an open “core platform” model that spans multiple entities, chains, and businesses while also being more region-based.

⁵ *Report on The Work of The Government*, China Daily, March 2021, <https://language.chinadaily.com.cn/a/202103/15/WS604ed1cfa31024ad0baaf337.html>

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As mobile payment and cross-border payment grows, omnichannel payment integration and the e-CNY will reshape China's payment system



Mobile payment remains the main area of development in Paytech, and developers are looking to make their applications more intelligent and secure

Mobile payment is hugely popular in China and continues to grow. As the integration of technology and payment accelerates, payment companies are shifting their focus to technological competition. For example, 5G's high speed and low latency meet the needs of consumers and businesses for stable, convenient and secure transactions, and AI automation is supporting the development of intelligent payment technology. Going forward, technologies such as QR code payment, audio point of sale (POS) systems, and facial recognition payment will continue to empower the mobile payment sector, making payment more convenient and secure. In addition, human-computer interaction (HCI) technologies represented by facial recognition and fingerprint recognition, and risk control technologies that combat attacks and fraud, are increasingly being deployed in China's online payment space, bolstering the security of payment technology.



The pandemic has spurred demand for cross-border transactions, boosting cross-border payments

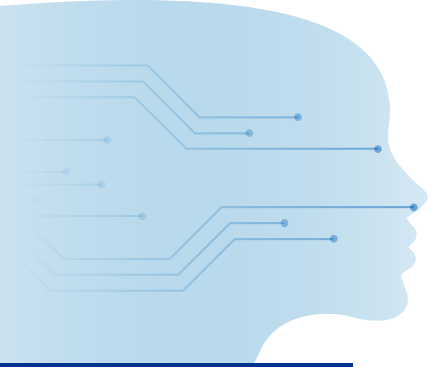
Following the outbreak of COVID-19, e-commerce has grown rapidly amid reduced cross-border travel, causing cross-border payments to rise significantly. In this context, fintech firms have provided online payment infrastructure that allows consumers to use local payment methods to make cross-border purchases. In the medium to long term, cross-border payment will be a key area for the development of payment technology, and fintech companies will focus on improving payment efficiency and reducing payment costs in cross-border transactions.



Omnichannel payment integration is a major development trend for financial institutions

With the full penetration of mobile Internet, payment companies have fully explored the consumer segment; and with nearly 99 percent of the mobile payment market already developed, corporate users will be the payment industry's next focus. Going forward, Paytech companies should integrate payment and its industry verticals in order to link corporate funds, payment, settlement, and value-added financial services in the upstream and downstream markets, and use digital technologies and the Internet to reconstruct industry chains and improve business efficiency and customer experience. As part of this trend, omnichannel sales and unified marketing (also referred to as "uni marketing") have become a trend in retail business, prompting fintech firms to provide one-stop omnichannel payment solutions. These solutions facilitate the flow of funds and information, help companies more efficiently handle fund operations, and upgrade companies' digital capabilities as well as their ability to keep track of changes in consumer behaviour.

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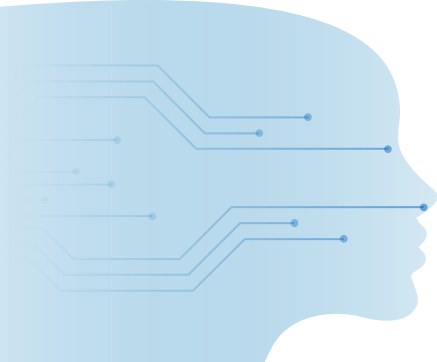
The e-CNY is being applied in a growing number of scenarios and will ultimately reshape China's payment system

As the e-CNY pilot programme expands, user and transaction volumes have steadily increased. Following its official launch, the e-CNY will promote the development of China's digital economy, reshape the country's payment system, and help the central bank apply measures across various scenarios at the government, business and consumer levels. In addition, we expect the e-CNY to boost innovation and provide important infrastructure for fintech companies, and also open up business opportunities for commercial banks and other financial institutions related to digital transformation. In the future, the use of the e-CNY may be extended to foreign exchange management and cross-border payments, and applied to the agriculture, education and urban construction sectors, contributing to the development of the "intelligence+" model and digital transformation.

In China, fintech's steady progress has reduced the cost of financial services, and the development of big data, blockchain and other technologies has given rise to more secure and convenient payment methods like the e-CNY, while also lending solid technical support to the development of the financial sector. Recently, regulatory governance in respect of digital platforms and data protection has been significantly strengthened, but regulation over the use and protection of data and information still needs to be enhanced amid the rapid growth of the payment industry.



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Regtech is facilitating the development of an innovative fintech ecosystem on both the regulatory and compliance sides

Powered by technology, various new financial trends and business models have been emerging, and the fusion of these trends and models has given rise to hidden financial risks that are diversified and potentially contagious. In this way, fintech presents both opportunities and challenges to regulators. Used correctly, Regtech can help regulators and businesses develop an innovative fintech ecosystem that is prudently supervised on both the regulatory and compliance sides.



Regtech services are becoming more intelligent, secure and value-added, and they are expanding to cover the entire financial supervision process

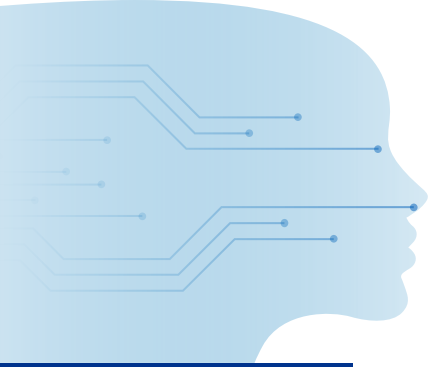
In recent years, Regtech has continued to develop and has been applied in the fields of anti-money laundering (AML), anti-fraud, anti-terrorist financing and tax regulation, among others, to enhance regulatory efficiency. For instance, the China Securities Regulatory Commission (CRSC) has been training AI models to map connected transactions and fund accounts through machine learning, so as to detect and combat illegal activities such as insider trading and market manipulation. In another example, the PBOC's Anti-Money Laundering Monitoring Centre is building an integrated analysis platform based on big data for the bank's second-generation AML monitoring and analysis system⁶. In recent years, regulators have been steadily collaborating with fintech companies to explore and develop advanced regulatory technologies.

At present, Regtech is still mostly focused on in-process detection and ex-post processing. In order to cope with the increasingly complex financial environment and well concealed financial crimes, Regtech needs to be combined with real-time data and risk assessment models to monitor the market in real time. Gradually, Regtech will be applied at an earlier stage so that regulators can make faster judgements before events unfold based on intelligent and high-value information. This objective has put forward new goals and directions for the application of technologies such as 5G data transmission, AI and cloud computing in Regtech. Meanwhile, as data security becomes a more prominent regulatory target, demands around the regulation of cross-border data activities and digital sovereignty will continue to grow, providing ample development space for Regtech in the fields of database and data flow management.

⁶ *Research on Frontier Regtech and its Application*, China Academy of Information and Communications Technology, November 2019, http://m.caict.ac.cn/yjcg/201904/t20190417_197906.html



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As Regtech business expands horizontally to other industries, modularity and scalability are the key to success

The financial sector is ahead of other industries when it comes to digitalisation. Regtech is developing rapidly in the financial sector, but it is also being widely applied in other industries. In line with the *14th Five-Year Plan's* call to build a “digital China,” connecting data between different industries and agencies will become a trend, making the “data silo” issues facing the Regtech sector a more pressing concern. Cross-industry development will only be possible after these issues are properly solved. For example, collaboration between tax authorities, the CBIRC, and banks has alleviated information asymmetry problems by connecting banks and enterprises with tax credit data. Under this arrangement, banks use tax credit data to make lending decisions, providing benefits to all three parties—tax authorities, enterprises and banks. This is a good example of how data connectivity between different industries can produce win-win benefits while also boosting the development of fintech.

The cross-industry development of Regtech requires the modularisation of core technologies and functions at an early stage of technology development, so as to reduce secondary R&D and learning costs and improve scalability.



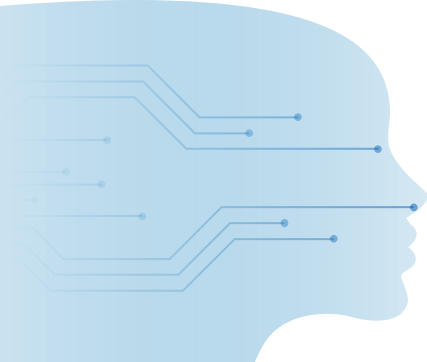
Compliance technology is moving from single applications to one-stop e-GRC solutions that cover all processes and data

At present, compliance technology is mainly being used by enterprises to ensure the compliance of contracts, documents, invoices and tax returns. For example, optical character recognition (OCR) technology is being used for invoice identification, and NLP technology is being used for proofreading and translation. In light of increasingly strict supervision and higher requirements on risk control, financial institutions are now more often required to provide reams of granular data to regulators. If different compliance applications are deployed for each business segment, the implementation and learning costs will be higher. Hence, more banks and financial institutions are adopting electronic corporate governance, risk and compliance (e-GRC) platforms empowered by Regtech.

In the third issue of the Hong Kong Monetary Authority's *Regtech Adoption Practice Guide*⁷, KPMG experts discussed a bank's partnership with a Regtech solution provider and a regulatory horizon scanning data provider, which enables the bank to access the latest regulations issued by governments, regulators and other third parties across different jurisdictions. Regulatory summaries are compiled by a team of compliance and legal professionals and then imported into the e-GRC platform through an API. Regulations, risk events, and other information are categorised by product, business function, jurisdiction, and publication date for the bank's perusal. Customised daily email alerts are also provided for subscribed users to help them monitor regulations. The ability of compliance technology to reduce costs and increase efficiency in the financial sector will encourage Regtech companies to move from providing a single compliance technology application to offering one-stop compliance solutions that cover all business processes and data.

⁷ *Third Issue of the Regtech Adoption Practice Guide*, HKMA, <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2021/20210927e1a1.pdf>

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The collaborative development of ABCD technologies (AI, blockchain, cloud computing and big data) in combination with new concepts like the metaverse should provide fertile ground for the development of the financial sector

Technologies are evolving quickly alongside the rapid development of fintech, but the underlying ABCD technologies remain the basis for fintech infrastructure and represent the path to further technological advances. Amid stricter data compliance and privacy protection requirements, balancing data integration applications with data security has become a critical issue for the fintech industry, and privacy computing technologies such as secure multi-party computation and federated learning have become hot areas of development. Going forward, the ABCD technologies will continue to be integrated to provide financial institutions and other companies with blended technology solutions that empower the digital transformation of the financial sector and drive business breakthroughs.



Big data: Data security and compliance, and data asset management are the focuses of the industry



New data standards are needed in the face of higher data security and compliance requirements

As the use of data increases in the digital economy, data loss and data quality issues are the major challenges facing data application developers. Furthermore, with the promulgation of the *Data Security Law* and the *Personal Information Protection Law*, security compliance in relation to data access and data use is drawing more attention. For this reason, data standards and norms need to be developed for big data applications to ensure data visibility, credibility, and security.



Unlocking the value of data—from data governance to data asset management

In recent years, companies have been steadily converting data into assets in order to tap its massive value, resulting in data becoming a major strategic asset for enterprises. Sound data asset management helps improve data reuse rates in financial institutions' operations and management and provides the foundation for unlocking data value. For financial institutions, establishing a data asset management system that emphasises data security and compliance, bolsters value adding uses of data, and enables the development of new business models is vital for long-term development. Such a system should cover data model management, data standards management, metadata management, master data management, data quality management, data security management, data development management, data asset circulation, data value assessment, and data asset operations.

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2

AI and intelligent automation: AI technology will develop in the direction of intelligence and security, with intelligent automation leading to lower costs and higher efficiency



As AI technology moves from perception to deeper cognitive intelligence, innovation, security and control are being assigned equal importance

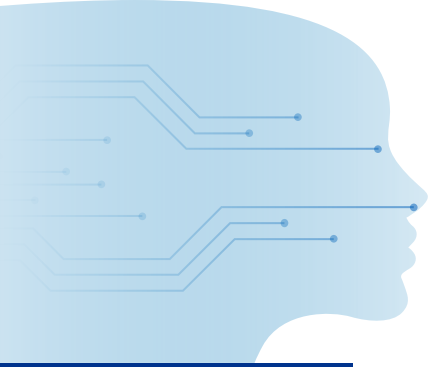
AI technology is the most promising technology among the underlying ABCD technologies (AI, blockchain, cloud computing and big data), and its capabilities now cover all scenarios in the financial sector. From a technical point of view, it is inevitable that AI will move from perception to a deeper level of cognitive intelligence, ultimately enabling AI recommendations and decision-making. In this context, cross-domain AI technologies such as “knowledge mapping,” “deep learning” and “continuous learning” need to be developed so that knowledge can be better understood and used by machines. In this way, AI technology can be more effectively applied to real-world financial business scenarios. Security and control represent another important development direction amid the tightening of national data security and privacy protection regulations in recent years. Security-related obstacles around AI technology development and applications can be overcome through industry standard setting, supervisory and legal actions, and further advances in technology development. From a technology development perspective, the reliability of AI algorithms and the ability to independently control core technologies should be improved to ensure system security at the source, and the security of data circulation should be strengthened using encryption, secure multi-party computation and federated learning in order to safeguard privacy.



Breakthroughs in intelligent automation are steadily reducing costs and raising efficiency

AI and intelligent automation complement each other, and breakthroughs will continue to be made in intelligent automation represented by RPA. For example, RPA can be used to achieve low code “light development” of business processes by way of “building blocks.” RPA can also be combined with other AI technologies such as NLP, image streaming and biometrics to make further technological advances. At the application level, the integration of intelligent automation with AI perception and cognition is promoting the transformation of business applications from simple workflows to data-based operations, which improves efficiency, reduces human errors and enhances lean management.

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3

The blockchain sector is overcoming technological challenges as it pursues diversified development and privacy computing synergies



Cross-chain technology is solving compatibility issues between different blockchains and invigorating technology development

In recent years, blockchain development has exploded, and its decentralised, immutable and trust-free attributes have provided a foundation of trust for the development of fintech. Blockchain has already been applied with some success in different financial scenarios, but difficulties and pain points still exist. For example, unified technological standards have not been established, and certain data formats and interfaces are not compatible between different blockchains, leading to problems when data and technologies are deployed, migrated and combined. Thus, alliances are urgently needed to achieve smooth cross-chain operations and promote blockchain technology across the industry. After blockchain is adopted, issues related to personal data security, data authenticity and accuracy will need to be addressed.

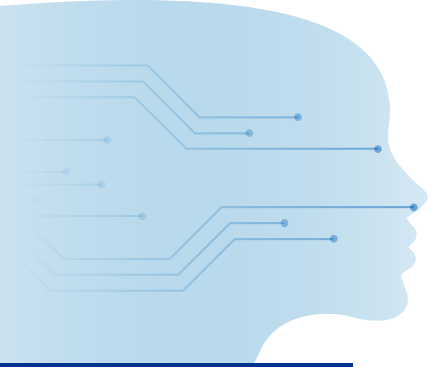


Synergies with privacy computing are enhancing data connectivity, security and computing power

The integration of blockchain and privacy computing is a hot area of development in the industry that serves as a great example of the “1+1>2” effect. While the underlying logic of privacy computing and blockchain are similar, the two technologies have distinct characteristics. By combining the two, enterprises can effectively realise secure data circulation and make data recordable, traceable and verifiable, thus ensuring data security and compliance.

The privacy computing industry has seen a burst of growth over the past 2 years and is regarded as a promising sector by industry players. However, privacy computing still faces many challenges brought by data security, algorithm acceleration, and scalability, as well as connectivity problems caused by algorithm differences. To address these issues, the industry needs to set standards and make additional technological breakthroughs. Industry standards and the regulatory system can provide high-level guidance for the development of privacy computing, as well as solid support for data security. On this basis, developers can use algorithm acceleration, communication acceleration, and code acceleration to optimise privacy computing algorithms, and hardware acceleration (such as GPU, FPGA and ASIC) can also be used to improve scalability. With respect to the scaling of privacy computing applications, accelerating the integration of sub-technologies (such as federated learning and secure multi-party computation) and strengthening collaboration with other technologies (such as blockchain) should effectively break down barriers. In addition, as the open-source framework of privacy computing evolves along with the fintech industry, new business models are being developed that are attracting significant attention.

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As a hot spot of development, the “Blockchain +” model is being applied across both horizontal and vertical scenarios

At present, “blockchain+” has become the main model for accelerating the use of blockchain technology in many industries; examples include “blockchain + manufacturing,” “blockchain + energy,” “blockchain + government,” “blockchain + taxation” and “blockchain + copyrighting.” In the finance sector, supply chain finance and green finance are two promising areas in which blockchain technology is being deployed and developed. For instance, blockchain technology is being used in supply chain finance to establish credit systems in which data can be easily transmitted and traced; and in green finance, blockchain technology is helping enterprises accurately collect carbon source and carbon sink data, raising the efficiency and convenience of green financial services.

It is worth noting that with the pilot promotion of the e-CNY, “blockchain + e-CNY” may become an important scenario in the future, with the potential to reshape China’s payment system, raise the status of the RMB in the international market, and bring disruptive changes to the industry.



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4

Cloud computing: By enhancing intelligence and security, distributed “multi-cloud” architecture adapts to the needs of multiple business scenarios and promotes cloud migration



Cloud computing is adapting to the needs of the financial sector and becoming more intelligent and secure

Cloud computing is helping fintech companies unleash the potential of AI and data. As the demand for agility and elastic computing grows, cloud computing will have a greater impact on the fintech industry. Meanwhile, as more companies move to the cloud, the demand for cloud security and stability will increase, and risk prevention and control for cloud computing and cloud services will become a key focus. Another emerging focus area for financial institutions is cloud backup and disaster recovery, which refers to using cloud technology to ensure data security, business continuity, and data backup and recovery capabilities.



Accelerated hybrid multi-cloud applications provide adaptive solutions that help financial institutions migrate to the cloud

Amid advancements in technology and changes in market demand, the cloud computing market has progressed from private and public cloud to hybrid cloud, edge cloud and other “multi-cloud” models. In the past 2 years, as major cloud service vendors and enterprises have gradually moved toward multi-cloud strategies, distributed multi-cloud architecture has become a popular development direction. Using a unified architecture, the distributed multi-cloud model helps enterprises solve the problem of location-independent cloud resources while also improving multi-cloud management through the integration of cloud models that adapt to different business scenarios. In this way, financial institutions are able to achieve “ubiquitous computing” and move completely to the cloud. However, multi-cloud models also come with greater complexity in terms of operations, maintenance and security risk management, which are areas that still need to be explored and addressed.

In addition to the ABCD technologies (AI, blockchain, cloud computing and big data) that are enabling the development of fintech, technologies such as Internet of things (IoT), augmented reality (AR), virtual reality (VR), mixed reality (MR) and digital twinning also present new opportunities for financial services. For instance, with the emergence of the metaverse concept, many enterprises are exploring the use of AR/VR and digital twin technologies in business and the consumer market. The metaverse concept has not yet been explored in the financial sector, although we can envision scenarios—for example, using intelligent automation to improve efficiency and provide an immersive experience for customers. At present, metaverse applications are not mature, but as AI and other underlying technologies advance along with front-end devices and content applications, the metaverse may go from concept to reality.

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Appendices

Appendix I

Summary of fintech-related Laws and Regulations

Date	Policy	Issued by	Official link
2021			
Jan	Notice on Further Optimising Cross-border Renminbi Policies to Support the Stabilisation of Foreign Trade and Foreign Investment	People's Bank of China, etc.	http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4157371/index.html
Jan	Measures for the Supervisory Rating of Consumer Finance Companies (Trial)	China Banking and Insurance Regulatory Commission	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/cn/view/pages/ItemDetail.html?docId=958815&itemId=928
Feb	Antitrust Guidelines for the Platform Economy	Anti-Monopoly Commission of the State Council	http://www.gov.cn/xinwen/2021-02/07/content_5585758.htm
Feb	Notice on Further Regulating the Internet Loan Business of Commercial Banks	China Banking and Insurance Regulatory Commission	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/cn/view/pages/governmentDetail.html?docId=967445&itemId=861&generaltype=1
Mar	Notice on the Issuance of the Implementation Opinions on Promoting the Co-construction of the Guangdong-Hong Kong-Macau Greater Bay Area as an International Financial Hub	Guangzhou Municipal Development and Reform Commission	http://jrjg.gz.gov.cn/zcqh/content/post_7201438.html
Apr	Notice on Banking and Insurance Sectors Providing High-quality Services for Rural Rejuvenation in 2021	China Banking and Insurance Regulatory Commission	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/cn/view/pages/governmentDetail.html?docId=976139&itemId=878&generaltype=1
Apr	Opinions on Strengthening Innovation in Modern Agricultural fintech Services to Support the Implementation of the Rural Rejuvenation Strategy	Ministry of Science and Technology, etc.	http://www.most.gov.cn/xxgk/xinxifenlei/fdzdqknr/fqzc/gf/wj/gfxw/2021/202104/t20210429_174233.html
May	Opinions on Accelerating Digital Development	Guangdong Provincial People's Government	http://www.gd.gov.cn/zwgk/wjk/qbwi/yf/content/post_3280668.html
May	Notice on the Promulgation of National Vocational Technical Skills Standards for Blockchain Application Operators	General Office of the Ministry of Human Resources and Social Security, etc.	http://www.mohrss.gov.cn/xxgk/2020/fdzdqknr/rcrs_4225/nrc/zyjnpj/202111/t20211123_428536.html
May	Notice on the Issuance of the Implementation Plan for Constructing a National Collaborative Innovation System for an Integrated Big Data Centre and Computing Hub	National Development and Reform Commission	https://www.ndrc.gov.cn/xxgk/zcfb/tz/202105/t20210526_1280838.html?code=&state=123
May	Several Opinions on Accelerating the Construction of Shanghai into a Global Asset Management Centre	Shanghai Municipal People's Government	http://jrj.sh.gov.cn/GFXWJ315/20210623/17f6c1ebc9054604870cc1216c05498c.html
Jun	Notice on Thoroughly Improving Financial Service Capabilities for Micro, Small and Medium-sized Enterprises	People's Bank of China	http://www.gov.cn/xinwen/2021-07/05/content_5622588.htm
Aug	Beijing's Implementation Plan for Accelerating its Construction into a Benchmark City for the Global Digital Economy	General Office of the Beijing Municipal Committee of the Communist Party of China	http://www.beijing.gov.cn/zhenqce/zhengcefagui/202108/t20210803_2454581.html
Sep	Opinions on Standardising the Application and Development of Open Source Technologies in the Financial Sector	General Office of the People's Bank of China	http://www.cac.gov.cn/2021-10/27/c_1636928705274546.htm
Sep	Administrative Measures for Credit Investigation Business	People's Bank of China	http://www.pbc.gov.cn/tiaofasi/144941/144957/4354378/index.html
Oct	Guiding Opinions on Promoting the New Development Pattern for Financial Industry Services	Shenzhen Office of the China Banking and Insurance Regulatory Commission, etc.	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/branch/shenzhen/view/pages/commo n/ItemDetail.html?docId=1013247&itemId=1041&generaltype=0
Nov	Notice on the Issuance of Several Measures by Beijing on Promoting the High-quality Development of Digital Trade	Beijing Municipal Commerce Bureau	http://jrj.beijing.gov.cn/zcfcg/bjszcfcg/202111/t20211102_2526584.html
Nov	Notice on Further Promoting the High-quality Development of Financial Services for Micro and Small Businesses in 2021	China Banking and Insurance Regulatory Commission	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/cn/view/pages/ItemDetail.html?docId=1020646&itemId=961&generaltype=0
Nov	Guiding Opinions on Supporting High-level Technological Self-reliance in the Banking and Insurance Industries	China Banking and Insurance Regulatory Commission	http://www.China_Banking_and_Insurance_Regulatory_Commission.gov.cn/cn/view/pages/governmentDetail.html?docId=1021840&itemId=861&generaltype=1
Nov	Notice on Issuing the Implementation Plan for Thoroughly Fulfilling Requirements for the Carbon Peak and Neutrality Goals and Driving the High-quality Green Development of Data Centres, 5G and Other New Infrastructure	National Development and Reform Commission, etc.	https://www.ndrc.gov.cn/xxgk/zcfb/tz/202112/t20211208_1307104.html?code=&state=123

The above information is taken from public sources and is not intended to be a complete list of relevant policies. The list is for reference only. For details, please consult with the relevant authorities.

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Appendix II

Profile of the Selection Expert Team

Li is a council member of the Society for Financial Econometrics (SoFiE), and an associate editor of the *Journal of Econometrics*, the *Journal of Business & Economic Statistics*, and the *Journal of Financial Econometrics*. She is also an elected fellow of the SoFiE, and was named an “Excellent Young Scientist” by the National Natural Science Foundation of China (Hong Kong and Macau). Li’s research interests include financial big data, risk management, green finance, large portfolio optimisation and personalised financial decision-making. She has published a number of academic papers in top international journals in the fields of finance, economics and statistics.

Jiang is president of the Financial Associations of the Chengdu High-tech Zone, Jinjiang District and Chenghua District, and he served as a member of the 8th Committee of the Chinese People’s Political Consultative Committee (CPPCC) of Wuhou District, Chengdu. Jiang has also served as a special investment advisor to the governments of the Chengdu High-tech Zone and Chenghua District, and as the head expert for the International Business Think Tank Alliance organised by the government of Jinjiang District. Jiang also worked with the governments of Beijing, Shanghai, Guangzhou, Shenzhen, Hangzhou, Macau and Hong Kong and various industry associations to establish the National Federation of Financial Technology Industry Associations in May 2020. In addition, he has served as a fintech expert advisor to the Chengdu Municipal Government, and as a review expert for industry functions for Chengdu’s Modern Financial Industry Ecosystem.

Li Yingying

Professor of the Department of Information Systems, Business Statistics and Operations, and Professor of the Department of Finance, School of Business Management, The Hong Kong University of Science and Technology
Acting Head of Financial Technology Thrust, Society Hub, The Hong Kong University of Science and Technology (Guangzhou)



Jiang Kun

Founding President of the Chengdu Financial Technology Association
President and Chairman of the Board of the Chengdu Future Digital Research Institute



Intelligence and fintech

Xu Li

Associate Professor of the Department of Economics, Antai College of Economics and Management, Shanghai Jiao Tong University



Huang Qun

Researcher in the Department of Computer Science and Technology, Doctoral Supervisor, Peking University



Xu’s research focuses on the platform economy, particularly in the fields of retail payment and industrial organisation theory. She has published over 20 academic papers in *The Review of Economics and Statistics*, the *Journal of Management Science and Engineering*, the *Journal of World Economy*, *China Industrial Economics* and other leading journals at home and abroad. In addition, Xu has led several projects conducted by the National Natural Science Foundation of China as well as major philosophy and social science research projects conducted by the Ministry of Education. She is currently a board member of the China Information Economics Society and a review expert for non-bank payment institution business for China UnionPay Network. Xu has participated in three price reform projects for bank cards in China and has completed multiple research projects on bank cards for China UnionPay and the PBOC’s Payment Division. In addition, she has conducted in-depth research on the development and regulation of the domestic and international retail payment industries.

Yin Zhentao

Director of the fintech Research Office of the Institute of Finance and Banking, Chinese Academy of Social Sciences

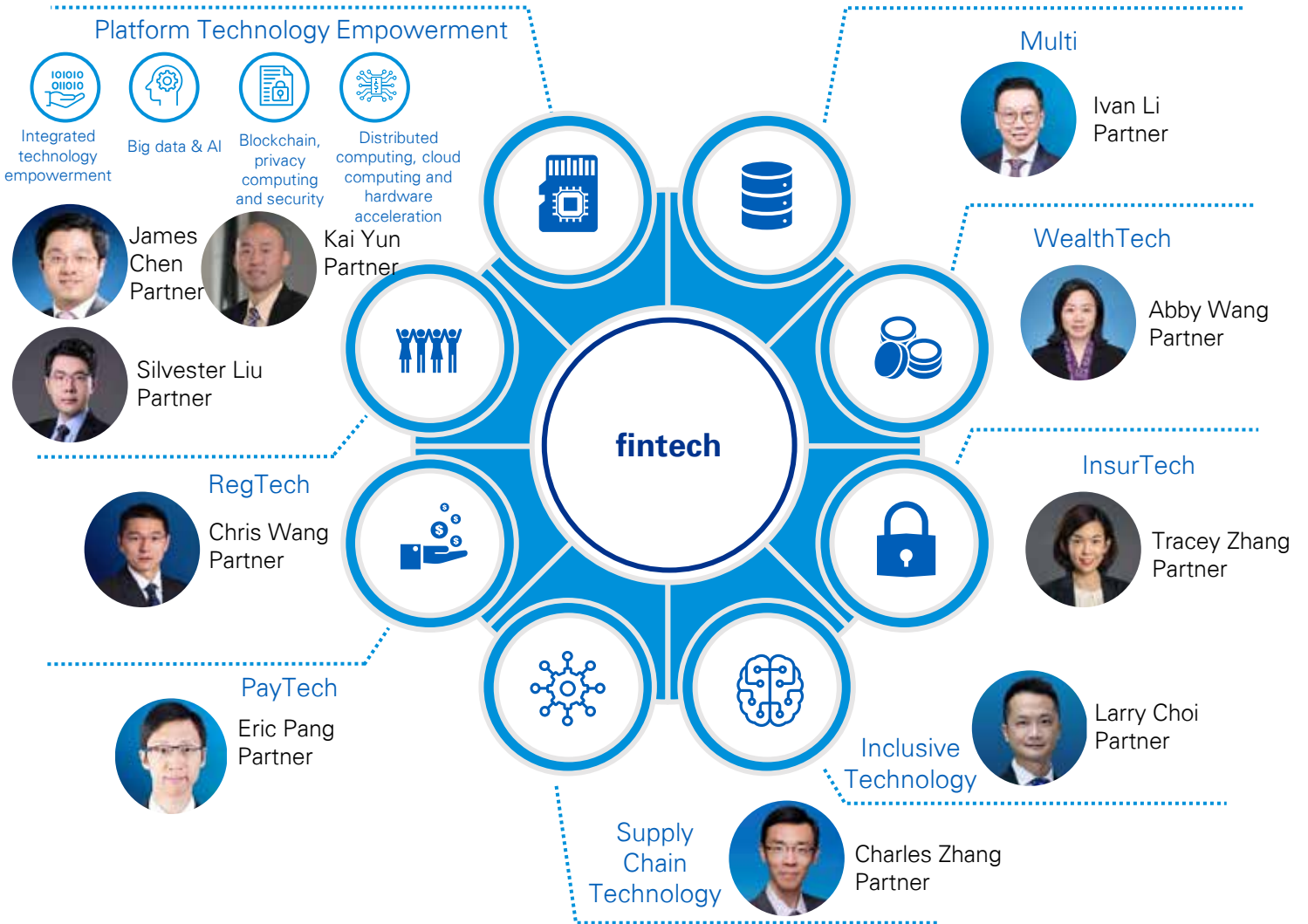
Yin is secretary general of the Research Base for Financial Law and Financial Regulation at the National Institution for Finance & Development. In the course of his research, which focuses on fintech and financial regulation, Yin has published more than 50 academic papers in leading journals such as *Management World*, *China Economic Quarterly*, *China Rural Economy* and *Political Studies*. In addition, he has led and participated in a number of provincial, ministerial and national social science research projects.



Huang was selected for the Chinese Academy of Sciences’ “Hundred Talents Program” and for the “Ten Thousand Talents Program.” He was also named a “StarTrack Scholar” by Microsoft Research Asia, and a “National Outstanding Scientific and Technical Worker” by the Chinese Institute of Electronics. His research focuses on computer networks, distributed systems, blockchain and big data. Huang has published more than 30 CCF A-category papers at leading conferences on networking and systems (including SIGCOMM, NSDI, INFOCOM, VLDB, and USENIX ATC). In addition, he was nominated for the best paper award by INFOCOM, and he won a best paper award from IWQoS. He has also led projects for the National Key R&D Program of China and the National Natural Science Foundation of China.

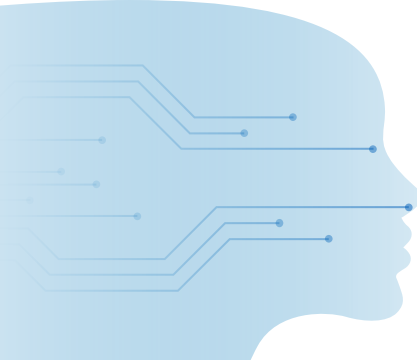
Appendix III

KPMG China's fintech Partner Team



Appendix III

KPMG China's fintech Partner Team (cont'd)



* The following list is in no particular order

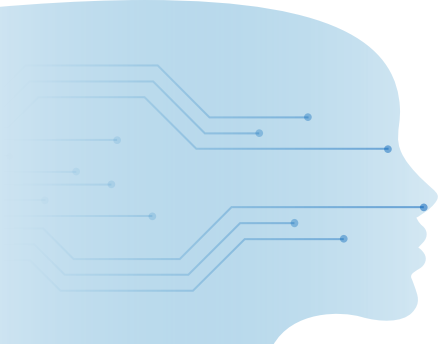
● Honson To Chairman, KPMG China and Asia Pacific	● Jacky Zou Vice Chairman and Senior Partner, Northern Region, KPMG China	● Tony Cheung Vice Chairman, Head of Financial Services, KPMG China
● Thomas Chan Head of Financial Services Assurance, KPMG China	● Sam Shi Head of Banking, KPMG China	● Ivan Li Managing Partner, Shenzhen, KPMG China
● Andrew Huang Head of Fintech, KPMG China	● Tracey Zhang Head of Tax, Financial Services Leader, KPMG China	● Abby Wang Head of Asset Management Services, KPMG China
● James Zheng Head of IT Advisory, Financial Services, KPMG China	● Koko Tang Head of Private Enterprise, Southern Region, KPMG China	● Kevin Kang Chief Economist, KPMG China
● James Chen Partner, Financial Services	● Larry Choi Partner, Financial Services	● Kevin Gong Partner, Financial Services
● Michael Guan Partner, Financial Services	● Wilson Huang Partner, Financial Services	● Yvonne He Partner, Financial Services
● Banny Leung Partner, Financial Services	● Emma Liu Partner, Financial Services	● Penny Li Partner, Financial Services
● Anthony Lee Partner, Financial Services	● Eric Pang Partner, Financial Services	● Melfice Pan Partner, Financial Services
● Candice Shui Partner, Financial Services	● Iris Tang Partner, Financial Services	● Forrest Wu Partner, Financial Services
● Vicky Xi Partner, Financial Services	● Christy Ye Partner, Financial Services	● Josh Ye Partner, Financial Services
● Charles Zhang Partner, Financial Services	● Patrick Zhang Partner, Financial Services	● Victor Zhang Partner, Financial Services
● Spencer Wu Partner, Corporate Services	● Oliver Xu Partner, Corporate Services	● Jessy Zhou Partner, Corporate Services
● Linda Zhao Partner, Corporate Services	● Felix Feng Partner, Tax Services	● Chris Ge Partner, Tax Services
● Adam He Partner, Tax Services	● Benjamin Lu Partner, Tax Services	● Grace Luo Partner, Tax Services
● Kelly Liao Partner, Tax Services	● Michael Li Partner, Tax Services	● Wayne Tan Partner, Tax Services
● Tanya Tang Partner, Tax Services	● Mimi Wang Partner, Tax Services	● Laura Xu Partner, Tax Services
● Jim Chen Partner, Management Consulting	● Eric Chang Partner, Risk Consulting	● Eric Gui Partner, Risk Consulting
● Harry Huang Partner, Management Consulting	● Jason He Partner, Management Consulting	● Kai Yun Partner, Management Consulting
● Frank Li Partner, Management Consulting	● Silvester Liu Partner, Management Consulting	● Alian Lian Partner, Management Consulting
● Chris Wang Partner, Risk Consulting	● Eric Xuan Partner, Management Consulting	● Louis Ng Partner, Deal Advisory
● David Zhou Partner, Deal Advisory	● Belinda Fan Director, Tax Services	● Vivian Kou Director, Tax Services
● Gracie Li Director, Tax Services	● Sophie Lu Director, Tax Services	● Minna Sheng Director, Tax Services
● Jerry Xie Director, Tax Services	● Alex Zhang Director, Tax Services	● Travis Du Director, Management Consulting
● Ma Jinping Director, Management Consulting	● Sandy Wang Director, Risk Consulting	● Jimmy Wei Director, Deal Advisory

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● Pulse of fintech series reports



● Ten Macroeconomic Trends in 2022



● White Paper on the Digital Transformation of Regional Banks



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in China

KPMG China
About 14,000 partners and employees



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