



PEOPLE'S REPUBLIC OF CHINA— HONG KONG SPECIAL ADMINISTRATIVE REGION

FINANCIAL SECTOR ASSESSMENT PROGRAM

June 2021

TECHNICAL NOTE—IMPLICATION OF FINTECH FOR THE REGULATION AND SUPERVISION OF THE FINANCIAL SECTOR

This Technical Note on Implication of Fintech for the Regulation and Supervision of the Financial Sector for the People's Republic of China–Hong Kong Special Administrative Region FSAP was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed in June 2021.

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June 7, 2021

TECHNICAL NOTE

IMPLICATIONS OF FINTECH FOR THE REGULATION AND
SUPERVISION OF THE FINANCIAL SECTOR

Prepared By
**Monetary and Capital Markets
Department**

This Technical Note was prepared by IMF staff in the context of the Financial Sector Assessment Program in Hong Kong Special Administrative Region, led by Ananthakrishnan Prasad. It contains technical analysis and detailed information underpinning the FSAP's findings and recommendations. Further information on the FSAP can be found at <http://www.imf.org/external/np/fsap/fssa.aspx>

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Glossary

AI	Authorized Institution
AML/CFT	Anti-Money Laundering and Counter-Financing of Terrorism
API	Application Programming Interface
BCBS	Basel Committee on Banking Supervision
BCD	Banking Conduct Department of the HKMA
BDAI	Big Data Analytics and Artificial Intelligence
BIS	Bank for International Settlements
BO	Banking Ordinance
BOT	Bank of Thailand
BSD	Banking Supervision Department of the HKMA
B2B	Business-to-business
B2C	Business-to-customer
CBDC	Central Bank Digital Currency
CCP	Central Counterparty
CFI	Cybersecurity Fortification Initiative
CFR	Council of Financial Regulators
CIS	Collective Investment Scheme
CISP	Cyber Intelligence Sharing Platform
CPMI	Committee on Payments and Market Infrastructures
C-RAF	Cyber Resilience Assessment Framework
DAG	Data Analytics Group
DLT	Distributed Ledger Technology
FAG	FinTech Advisory Group
FATF	Financial Action Task Force
FCP	Fintech Contact Point
FFO	FinTech Facilitation Office
FMI	Financial Market Infrastructure
FPS	Faster Payment System
FSAP	Financial Sector Assessment Program
FSC	Financial Stability Committee
FSS	Fintech Supervisory Sandbox
FSTB	Financial Services and the Treasury Bureau
GFIN	Global Financial Innovation Network
HKAB	Hong Kong Association of Banks
HKEX	Hong Kong Exchanges and Clearing Limited
HKICL	Hong Kong Interbank Clearing Limited
HKMA	Hong Kong Monetary Authority
HKSAR	Hong Kong Special Administrative Region
IA	Insurance Authority
ICO	Initial Coin Offering
IEO	Initial Exchange Offering

IFEC	Investor and Financial Education Council
IFPCD	Insurance Fraud Prevention Claims Database
IHC	Immediate Holding Company
IOSCO	International Organization of Securities Commissions
IRIS	Intelligence Relationship Identification System
ITC	Information and Technology Communication
JETCO	Joint Electronic Teller Services Limited
KRI	Key Risk Indicator
MIDAS	Motor Insurance DLT-based Authentication System
ORM	Operational Risk Management
PBoC	People's Bank of China
PCPD	Privacy Commissioner for Personal Data
PDPO	Personal Data (Privacy) Ordinance
PFMI	Principles for Financial Market Infrastructure
PHE	Public Housing Estate
PoC	Proof-of-Concept
PSSVFO	Payment Systems and Stored Value Facilities Ordinance
RegTech	Regulatory Technology
RPA	Robotic Process Automation
SFC	Securities and Futures Commission
SFO	Securities and Futures Ordinance
SME	Small- and Medium-sized Enterprise
SPM	Supervisory Policy Manual
SupTech	Supervisory Technology
SVF	Stored Value Facility
TN	Technical Note
TSP	Third-party Service Provider
UHC	Ultimate Holding Company
VA	Virtual Asset
VASP	Virtual Asset Service Provider
VB	Virtual Bank

EXECUTIVE SUMMARY¹

The Hong Kong Special Administrative Region (HKSAR) is among the world's major fintech hubs, well positioned to develop fintech initiatives from its traditional strengths in financial services. Key factors enabling the HKSAR to emerge as a fintech hub include its presence as an international financial center, its free-flowing talent and capital, a highly developed information and technology communication (ITC) infrastructure, and its most unique trait, a geographical and strategic advantage by proximity to the market in Mainland China.

The HKSAR Government adopts a multi-pronged approach in promoting and facilitating fintech development. While investment in the HKSAR's fintech sector is significant, supporting fintech initiatives has also been one of the HKSAR Government's priorities. The Government has launched a series of initiatives covering funding, training, promotion, business-to-business (B2B) and business-to-customer (B2C) fintech adoptions in recent years. In this context, the Hong Kong Monetary Authority (HKMA) has received more than 530 notifications of major digital banking and other fintech initiatives from banks as of November 2020 since January 2017.

Most fintech initiatives are related to banking and mobile payment activities, followed by capital markets and insurance initiatives. The banking sector has seen the bulk of the recent fintech activity in the HKSAR, with virtual banks (VBs), open banking and payments initiatives leading the way. In capital markets, technology was already significantly built into the sector and the most significant recent development was the surge in the offer and trade of virtual assets (VAs). The insurance sector is gradually adopting technology in its product distribution with reduced reliance on face-to-face interactions with clients.

Regulation and supervision of fintech is carried out and coordinated by each of the financial sector regulators, overseen by the Financial Services and Treasury Bureau (FSTB). The HKMA, the Securities and Futures Commission (SFC) and the Insurance Authority (IA) regulate and supervise fintech activities and products as they fall within each of their mandates for banking, securities and futures markets and insurance. Coordination of common matters is undertaken under the auspices of the FSTB, as well as via bilateral cooperation between sectoral regulators. The licensing of money lenders (including those utilizing fintech in their business) and the regulation of their activities are governed by the Money Lenders Ordinance (Cap. 163) ("MLO"). While such alternative financing is currently immaterial in the HKSAR, their activities may become more significant should growth be proportionate to the increased availability of new technologies. Reviewing the regulatory perimeter of non-bank fintech companies may be warranted.

The HKMA has taken a proactive approach towards fintech to encourage innovation, competition, and improve financial inclusion. The HKMA established the Fintech Facilitation Office (FFO) to promote fintech initiatives. Furthermore, it launched "Smart Banking" initiatives to help the banking sector embrace opportunities created by the convergence of banking and technology, including the launch of the Faster Payment System (FPS), virtual banking, Banking Made

¹ This technical note was prepared by Hee Kyong Chon, Cristina Cuervo and Elias Kazarian (IMF/MCM).

Easy initiative, and Open Application Programming Interface (API). The HKMA adopts a risk-based and technology-neutral approach to fintech matters and has better applied technology and data science to its operations as seen with its Digitalization Office tasked with digitally transforming the HKMA into a more data-driven regulator. To leverage on the existing infrastructure while maintaining an innovative and competitive environment, the HKMA could assume a more active role in encouraging and enabling interconnectivity and interoperability between new fintech solutions and existing infrastructures including payments, as long as it is beneficial for the economy as a whole. Furthermore, the HKMA may, where applicable, encourage network-based critical service providers to accommodate international communication and message standards.

The introduction of virtual banking has gained traction and is promoting competition in the banking industry. While many of the newly licensed VBs delayed their launch to the second half of 2020 partly due to the COVID-19 pandemic, incumbent banks are strengthening mobile services and accelerating digital financing based on fintech to keep competitive with VBs. While VBs remain relatively new in the HKSAR, close monitoring of initial operations (e.g., any signs of aggressive behaviors to build market share) and comprehensive assessments on VBs' medium- to long-term viability will be critical before additional licenses are granted.

The use of third-party technology service providers is increasing. While the HKMA monitors the interconnectedness resulting from dependencies of banking industry on fintech through several channels and ongoing supervisory activities, a deeper engagement between fintech firms and financial institutions may necessitate a methodology to recognize the degree of interconnectedness and concentration risk in a more systematic and comprehensive manner. With respect to open banking, the HKMA adopts a collaborative and phased approach in implementing Open API and acknowledges the importance of defining a more detailed set of standards over the safe implementation of Open APIs across the industry. Open banking remains an area in development in the HKSAR, and the HKMA is encouraged to continue close monitoring of Open API implementation, particularly the manner in which Authorized Institutions (AIs) manage the relevant risks and challenges of Phases III and IV, and additional considerations to strengthen security and consumer protection.

The SFC has been actively monitoring developments in the VA industry and has initiated a significant amount of regulation in this area. From warnings to investors on initial coin offerings (ICOs) to regulatory initiatives on the relevant aspects of VA activities that relate to securities and futures markets, the SFC has been an active regulator in the VA space. The relatively recent framework for the regulation and supervision of VA trading platforms, while voluntary in nature, is a detailed and comprehensive framework that covers the most relevant features and particular risks of these marketplaces and should allow the SFC to better understand the risks of the sector through the upcoming licensing of new platforms. The framework lays foundation for a subsequent proposal to regulate virtual asset trading platforms under the Anti-Money Laundering and Counter-Terrorist Financing Ordinance (Cap. 615) ("AMLO") to implement the latest FATF requirements. We encourage the SFC and other HKSAR authorities to continue monitoring VA activities in the region, including those of non-licensed platforms, with a view to containing the buildup of risks, including of criminal

misuse, that may emerge as the market continues to develop and certain activities continue to take place in an unregulated space.

Overall, going forward, financial sector authorities are encouraged to continue deepening their cooperation to maintain a proactive cross-sectoral approach as fintech pervades across activities. With an already functioning coordination framework, authorities can continue to deepen it and to proactively identify areas of information that may be of common interest, and collaboratively converge to common principles and good practices on cross-sector fintech issues for a more holistic activities-based and consistent approach. Frameworks for cyber-/IT-related incident reporting, information sharing, and the implications of artificial intelligence adoption by the financial sector would be the examples that benefit from this approach.

Table 1. Hong Kong SAR: Key Recommendations			
#	Recommendations and Responsible Authorities	Recipient(s)	Timing*
Institutional Setting and Regulatory/Supervisory Approach to Fintech			
	Develop a more robust process for information exchange amongst regulators to facilitate a better understanding and supervision of cross-sector fintech issues (¶116).	HKSAR authorities	C
	Continue to review as necessary the regulatory perimeter of non-bank fintech companies (¶117).	HKSAR authorities	C
	Promote consistency and facilitate information sharing across financial sectors with respect to cyber risk supervision; review and compare incident reporting frameworks (including minimum incident reporting parameters) across sectors and apply best practices to other sectors (¶43-46).	HKSAR authorities	ST
	Consider adding more clarity and transparency to the minimum requirements on Immediate Holding Companies of Virtual Banks by revising the Authorization Guidelines (¶69).	HKMA	ST
	Consider undertaking an exercise to map network interdependencies of key elements of the financial sector, including key technology systems in use by supervised firms, as fintech firms and financial institutions become more interconnected (¶82).	HKSAR authorities	MT
	Continue to closely monitor the progress of open API implementation including how AIs manage the relevant risks and challenges going into Phases III and IV, and further consider the need to strengthen security and consumer protection (¶88).	HKMA	ST
Payments and Settlement Infrastructure			
	Update Hong Kong's overall fintech strategy, driven by a balance between competition and cooperation, and by leveraging on existing payment and settlement infrastructure (¶101).	HKSAR authorities	I
	Review the regulatory and oversight framework as fintech innovations are introduced in the payments and settlement space (¶105)	HKMA	ST

Table 1. Hong Kong SAR: Key Recommendations (concluded)

#	Recommendations and Responsible Authorities	Recipient(s)	Timing *
	Assess if payment and settlement infrastructures should adopt distributed ledger technology (DLT)-based solution for their critical functions, in particular in terms of whether the services have an appropriate legal and operational basis (¶107).	HKMA	C
	Where applicable, encourage network-based critical service providers to accommodate international communication and message standards (¶110).	HKMA	ST
VAs			
	Enhance the monitoring of holdings of VAs by financial sector entities by making a more systematic data collection for all types of entities. (¶112).	HKSAR authorities	ST
	Continuous monitoring of VA trading activities in the HKSAR in order to identify and address any risks, including of criminal misuse, building up in the system (¶124).	HKSAR authorities	C
	Continue ongoing cooperation among regulators to monitor VA activities and identify potential risks to the financial system (¶127).	HKSAR authorities	C
* C = continuous; I = Immediate (within one year); ST = Short Term (within 1–2 years); MT = Medium Term (within 3–5 years)			

INTRODUCTION

1. **This technical note (TN) covers the implications of fintech for the regulation and supervision of the HKSAR financial services sector.**²This note is part of the 2019 Financial Sector Assessment Program (FSAP), drawing on discussions held with government officials of the HKSAR virtually from April 28 to May 8, 2020. Due to the Covid-19 pandemic, the authors proceeded with the drafting of this note on the basis of inputs and views expressed in virtual meetings with government officials but were not able to discuss with the private sector and have limited views on the fintech market landscape in the HKSAR. This note also benefits from materials provided by authorities as well as publicly available information. The authors are grateful to the authorities for their excellent cooperation in very unusual circumstances.
2. **The note draws upon guidance developed by global standard-setting bodies to support the analysis and policy recommendations.** This note does not aim at carrying out a detailed review of the current regulatory regime, as no formally binding standards exist for fintech, with the exception of the October 2018 Financial Action Task Force (FATF) standards related to virtual asset service providers (VASPs), which cover the anti-money laundering and counter-financing of terrorism (AML/CFT) aspect. The TN anchors views and recommendations using international guidance and relevant frameworks (e.g. Financial Stability Board publications, Basel Committee on Banking Supervision (BCBS) and International Organization of Securities Commissions (IOSCO) guidance, Committee on Payments and Market Infrastructures (CPMI) guidance, the CPMI-IOSCO Principles for Financial Market Infrastructure (PFMI), Bali Fintech Agenda, etc.). It should be noted that while the TN may refer to AML/CFT relevant issues and provide policy advice as needed, no assessment or detailed analysis of compliance with the FATF standards has been carried out.
3. **The note is structured in three main sections.** The first section briefly describes the industry landscape for fintech in the HKSAR, its most pressing topics and relevant initiatives. The second section focuses on how responsibilities are distributed in relation to fintech and the financial sector, and how each of the HKSAR's sectoral financial regulators engages with the industry, including their approach to regulatory technology (RegTech) and supervisory technology (SupTech) where relevant, and the specificities of their sandboxes. The third section provides a more detailed analysis on a number of selected topics that are deemed more relevant for the HKSAR in the context of the FSAP based on significance, potential risks and financial stability impact: virtual banking, third-party risk/open API, payment system initiatives and VAs.
4. **The case studies described in this note do not indicate endorsement of the underlying technologies and business models.** One of the important features and challenges is that most of the fintech business models and underlying technologies are still under development and evolving very rapidly. This note includes several case studies which have been selected to illustrate industry developments in the jurisdiction. The inclusion of specific cases in this report should not be construed as an endorsement.

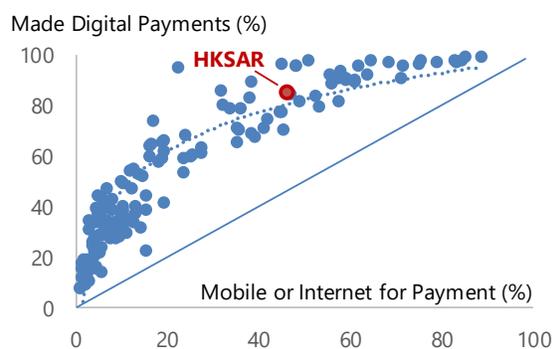
FINTECH INDUSTRY OVERVIEW

² This technical note was produced by Hee Kyong Chon, Cristina Cuervo and Elias Kazarian. This technical note is based on available information as of November 30, 2020.

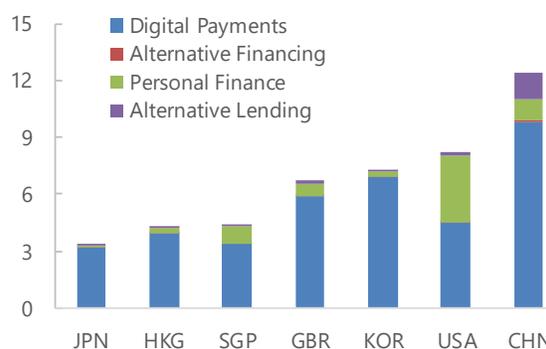
5. The HKSAR is well positioned to develop fintech through its traditional strengths in financial services. Like its major regional peers, the HKSAR has a high digital payment rate. In 2018, the HKSAR ranked fifth in digitalization of the traditional financial sector and observed the percentage of fintech users reach 35 percent;³ in 2019, the consumer fintech adoption rate increased to 67 percent.⁴ Key factors enabling the HKSAR to emerge as a fintech hub include its presence as an international financial center, its free-flowing talent and capital, a highly developed ITC infrastructure, and its most unique trait, a geographical and strategic advantage by proximity to the Mainland Chinese market. Over the past few years, increased collaborations between the incumbents and newcomers capitalizing on fintech have enabled new and enhanced modes of service delivery. On a B2B level, some large financial institutions have turned to fintech startups and companies for innovations to reduce costs; on a B2C level, similar efforts have been made to provide more consumer-centric services (e.g. VBs, e-wallets, etc.).

Figure 1. Hong Kong SAR: Fintech and Digital Payments in the HKSAR and Major Peers

Usage of digital payments is high in the HKSAR, while mobile and internet use to make/receive payments is average



Compared to peers, the HKSAR's 2019 transaction value is high for digital payments but not for other fintech means



Source: Statista, WEO, Staff Computations, IMF Financial Access Survey

Notes: Digital payments made = percentage of respondents, ages 15+, who report using mobile money, a debit or credit card, or a mobile phone to receive a payment through an account in the past 12 months. Mobile or Internet for Payment = percentage of respondents, ages 15+, who report using a mobile phone or the internet to make or receive payments, to make a purchase, or to send or receive money through their financial institution account or through the use of a mobile money service in the past 12 months. In the right-hand chart, fintech transaction value (expressed as a percentage of domestic GDP) includes digital payments, online crowdfunding, robo-advisers and automated wealth services, and marketplace lending.

6. Investment in the HKSAR's fintech sector is significant. In the first half of 2019, Hong Kong fintech companies raised US\$152 million (up 561 percent from the same period last year)⁵ and a total of 84 new listings were recorded, raising HK\$69.8 billion in the capital markets (up 35.2 percent from the same period the year before), propelling the HKSAR to the first place among Asia's Initial Public Offering markets.

7. Fintech is also one of the HKSAR Government's top priorities, and they have rolled out a wealth of fintech programs and initiatives. The HKSAR Government has launched a series of

³ Cambridge Judge Business School, 2018 Global Fintech Hub Report, November 2018.

⁴ Ernst & Young, Ernst and Young Global Fintech Adoption Index 2019, June 2019.

⁵ South China Morning Post, August 2019.

funding, educational and business opportunities. These include a fund aimed at encouraging local businesses to upgrade their use of everyday technology, and a fund to stimulate private investment in local innovation and technology start-ups. The Cyberport tech and innovation incubator already counts about 1,200 companies and over 500 start-ups among its ranks. The Government has earmarked HK\$5.5 billion for the development of Cyberport 5, a fifth building that is expected to attract a further 100 tech companies and 700 start-ups.

8. Over 530 notifications of major digital banking and other fintech initiatives from banks have been received by the HKMA as of November 2020 since January 2017. Of these, more than 100 projects related to mobile payments; over 130 projects related to cloud computing; around 80 customer authentication initiatives including biometric authentication and soft tokens; and more than 30 remote customer onboarding projects. The remaining projects included chatbots powered by artificial intelligence, enhanced financial services leveraging DLT, and social media platform integration using API. Some of these projects were delivered by AIs in collaboration with fintech firms.

9. The focuses of fintech companies and start-ups in the HKSAR are diverse.⁶ Fintech companies more than doubled to 600 in 2019, compared to 230 in 2017. The largest percentage of companies (18 percent) focused on big data and artificial intelligence with 12 percent on blockchain (non-digital assets), 12 percent on InsurTech, 9 percent on compliance and RegTech, and another 9 percent on payment solutions. These broad categories encompass further diversity of products and services including alternative data credit scoring, financial product comparison, algorithmic trading, and wealth management. Four companies in the HKSAR were identified as fintech unicorns as of 2019.⁷ Many fintech companies see the HKSAR as a base for global expansion, and a quarter of them view the HKSAR as a launchpad for entering the Southeast Asian markets.

10. With regard to the changes occurring in the market, retail banking is shifting to digital channels. The HKMA data shows a steady growth in retail internet banking and mobile payments and a fall in phone banking over recent years; the number of internet banking accounts is also increasing. It is particularly notable that the number of bank accounts opened online has rapidly grown in recent years. A shift to digital channels in insurance products appears to be slower but picking up. As far as banking channels are concerned, there was an increasing proportion of online sale through banks' digital platforms (e.g. website and mobile applications) for some relatively simple products (such as non-participating endowment insurance and term life insurance). For general insurance policies, the majority of travel insurance sold via banks were through online sales.

⁶ The Hong Kong Fintech ecosystem study, which surveyed about a sixth (100) of Fintech companies in Hong Kong (>600), conducted by InvestHK (a department of HKSAR Government) in September 2019.

⁷ Airwallex (a cross-border payment service provider), TNG (an e-wallet provider), WeLab (an online lending platform), and BitMEX (a cryptocurrency trading platform) (source: Hong Kong FinTech White Paper 2019, WHub).

Table 2. Hong Kong SAR: Retail Transactions by Channel (In billion HKD)
(3-year rolling average)

Monthly average amount (In billion HKD) of financial transactions conducted by customers through:	2016	2017	2018	2019
Internet banking accessed via personal computers	392	466	492	495
Internet banking accessed via mobile devices	42	60	123	176
Phone banking	N/A	117	64	56
Self-service terminals (e.g. ATMs, cash deposit machines, cheque deposit machines)	N/A	N/A	N/A	203
Contactless mobile payments	N/A	0.235	1.343	1.673

Source: HKMA.

Table 3. Hong Kong SAR: New Insurance Production (General Business) by Distribution Channel (In percent)

General Business									
	Agents	Banks		Brokers	Direct Sales		Online	Others	Total
		Online	Others		Telemarketing	Others			
2017	30	0	14	41	5	7	2	1	100
2018	29	1	13	42	5	7	2	1	100

Source: IA.

Table 4. Hong Kong SAR: Number of Internet Banking Accounts

2014	2015	2016	2017	2018	2019
10,426,966	11,322,176	12,148,725	13,236,506	14,329,367	15,758,220

Source: HKMA.

Table 5. Hong Kong SAR: Number of Non-Face-to-Face Opening of Bank Accounts

	Accumulated no. of bank accounts open (as of Dec 2018)	Accumulated no. of bank accounts open (as of Dec 2019)	No. of bank accounts opened in 2018	No. of bank accounts opened in 2019
Total	9,261	28,037	9,261	18,776

REGULATORY APPROACH

A. Institutional Setting and General Approach to Fintech

11. The development of fintech in the HKSAR has accelerated significantly in recent years, partly due to the launch of a number of regulatory initiatives. Financial sector regulators have been actively engaged in fintech, issuing statements, guidelines and rules on a variety of topics. For example, regulation to support the creation of VBs, as well as the development of Open API, are both welcome developments on the banking industry and are expected to improve customer experience. Similarly, the Payment Systems and Stored Value Facilities Ordinance (PSSVFO) has allowed technological advancements in retail payment products and services. A number of statements, guidelines and circulars have been issued in relation to VAs to clarify the regulatory and supervisory approach to the offering, trading and investment in these types of assets. These and other regulatory initiatives are described in more detail in this note, but also refer to Annex 1 for a list of all fintech related regulatory initiatives issued to date by financial regulators in the HKSAR.

12. The HKSAR's financial regulators have actively approached fintech innovations within their mandates. The regulatory and supervisory responsibilities regarding fintech in the HKSAR are divided among the three sectoral supervisory authorities for banks (the HKMA), securities and futures markets (the SFC), and insurers (the IA). Each authority has created its own channels for industry outreach, as well as for communication in relation to licensing (i.e. sandboxes). Similarly, each authority determines its approach to monitoring the regulatory perimeter, identifying risks and prioritizing regulatory initiatives.

13. The FSTB coordinates all domestic financial regulators to monitor the development and emerging risks of cross-sector and industry-wide issues, including those with regard to fintech services and activities. The FSTB holds regular meetings with financial regulators to oversee and address issues such as financial stability, investor protection and cybersecurity, and relevant fintech issues are discussed in this context. Financial regulators would bring to this forum any fintech matter where they consider cross-sectoral coordination is required or would benefit from discussion and input from their peers. On the market development front, in addition, InvestHK, one of the government departments, has a dedicated fintech team as part of its investment promotion mandate.

14. The sectoral approach to fintech is also bridged by agency cooperation for targeted initiatives. The regular, established mechanisms for supervisory cooperation and policy coordination among the HKMA, the SFC and the IA are used as needed for any fintech related matters. Importantly, in 2017, a single point of entry was created linking up the sandboxes of the HKMA, the SFC and the IA, in an effort to facilitate pilot trials of cross-sector fintech products. Also, supervisory authorities cooperate among them when required for regulatory or supervisory initiatives. For example, the SFC, in consultation with the HKMA, provided guidance to the industry on online distribution and advisory platforms for investment products in 2018. Similarly, the HKMA and the IA collaborated to streamline the requirements on suitability assessment and to strengthen requirements on product disclosure applicable to Als' sale of certain life insurance products through digital distribution channels in 2018. In addition, the IA and the HKMA also collaborated to provide guidance on requirements of sandbox applications for using video conferencing tools in the sale of insurance products in 2020.

15. Potential regulatory gaps in financial activities arising from fintech activities are identified and closed through discussions among the FSTB and the relevant domestic financial regulators. For example, the FSTB, the HKMA, and the SFC are coordinating a review of the local regulatory approaches for VAs in the HKSAR. High-level cross-sectoral platforms such as the Council of Financial Regulators (CFR) and the Financial Stability Committee (FSC) also facilitate exchanges among the Government and financial regulators on fintech matters. In particular, collaboration among domestic supervisors is active with respect to the conduct-risk related issues such as Als' sale of investment or insurance products through digital channels.

16. Nevertheless, there is room for improvements in coordination among sectoral regulators. While authorities are used to cooperating bilaterally on a number of initiatives and resort to one another for discussion when needed, it would be beneficial to more proactively identify areas of information that may be of common interest in cross-sector fintech issues, at an early stage. For instance, given the growing adoption of artificial intelligence by the banking industry, the HKMA conducted a survey in Q3 2019 on the use of artificial intelligence by *banks* and noted that many banks are adopting artificial intelligence applications.⁸ The research found that the banks leverage technology firms' know-how in various areas from customer-facing services (e.g., chatbots, remote onboarding, and personalized marketing) to internal process and risk management areas (e.g., operational automation, cyber security and fraud detection, AML, etc.). As a follow up, in November 2019 the HKMA published a set of high-level principles on the use of artificial intelligence and big data analytics, which covers governance, design and development, and monitoring and maintenance as well as consumer protection.⁹ The Mission is of the view that the relevant survey could have been expanded to other sectors such as securities and insurance, and the established general principles could be applied to the whole financial sector beyond the banking sector.¹⁰ While it would be difficult to devise a one-size-fits-all guideline that suits the regulatory ambit and scope of different regulators, the authorities may consider enhancing the process of information exchange at the aforementioned high-level cross-sector platforms, such as the CFR and FSC to facilitate a better understanding and supervision of industry-wide fintech issues.

17. Reviewing as necessary the regulatory perimeter of non-bank fintech companies may be warranted. The licensing of money lenders, whether they undertake fintech activities or not, and the regulation of money-lending activities are governed by the MLO. This applies to conventional money lending activities, as well as to non-bank financial institutions' online lending. Although such alternative financing is currently immaterial, loans continue to be provided to individuals and small- and medium-sized enterprises (SMEs) and may become more significant in the medium term should growth be proportionate to the increased availability of new technologies.¹¹ As for credit reference

⁸ Link to the survey results: [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Artificial_Intelligence_\(AI\)_in_Retail_Banking.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Artificial_Intelligence_(AI)_in_Retail_Banking.pdf)

⁹ There are also general principles on consumer protection highlighting four major areas, namely governance and accountability, fairness, transparency and disclosure, and data privacy and protection. Banks are expected to consider these principles when adopting their AI applications. Link to the relevant circulars: <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191101e1.pdf> and <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191105e1.pdf>

¹⁰ As a part of the SFC's 2018 hedge fund manager survey, the SFC surveyed over 550 SFC-licensed hedge fund managers as of 30 September 2018 on whether they used machine learning technology in their investment process.

¹¹ For example, WeLab in Hong Kong was named as one of the top 100 fintech companies in the world – #7 in China and #23 globally in a 2018 KPMG report.

agencies that provide personal credit information through online platforms, they are under the purview of the data protection authority and are not directly included in the financial regulatory ambit.¹² The banking and non-bank industry associations are currently developing an industry code of practice, to be endorsed by the HKMA, to strengthen governance of credit reference agencies.

Box 1. Digital Lending Platforms

Digital lending attempts to perform each step in the lending process through digital channels. It provides access to expansive data and *sophisticated algorithms*, allowing new digital lending companies to compete with traditional banks by offering new types of lending options.

Participants usually have access to digital platforms to facilitate funding. Borrowers include consumers and small businesses, while individuals and institutional investors provide capital. Digital lending companies match borrowers with lenders directly via online auctions.

Money lending business in the HKSAR is subject to statutory regulation under the MLO. Under the current regulatory regime, a person carrying on business as a money lender in Hong Kong must obtain a money lender's license.

Large lending start-ups in HK include:

- MoneySQ.com, partnered with a licensed fund manager, is an online lending platform for individuals and businesses.
- WeLab analyzes unstructured mobile big data within seconds to make credit decisions for individual borrowers.
- Qupital is an online invoice trading platform that helps business raise funding against their unpaid invoices in 24 hours or less.

Source: Whub, MoneySQ webpage.

¹² The banks need to observe the HKMA's Supervisory Policy Manual for the sharing and use of credit data through credit reference agencies and require the credit reference agencies to have effective control systems to ensure compliance with all relevant requirements of the Personal Data (Privacy) Ordinance (PDPO) and the Code of Practice on Consumer Credit Data issued by the Privacy Commissioner for Personal Data (PCPD).

B. The HKMA

General Approach to Fintech

18. The HKMA takes a proactive approach towards fintech to encourage innovation and competition, and to improve financial inclusion and coverage for underserved clienteles in the banking sector. In September 2017, the HKMA launched the “7 Smart Banking Initiatives” to help the banking sector embrace opportunities created by the convergence of banking and technology.¹³ The seven initiatives are the launch of FPS, enhanced FSS, promotion of virtual banking, Banking Made Easy initiative, Open API, closer cross-border collaboration, and enhanced research and talent development. To support these initiatives, the HKMA established the FFO in 2016. The FFO is led by a Chief Fintech Officer with about 20 full-time employees. With respect to financial inclusion, the HKMA has been actively encouraging banks to devise new solutions to extend the coverage of banking services, especially in remote areas and public housing estates (PHEs). For example, retail banks have launched mobile branches to serve customers in PHEs on a rotating basis. Self-service banking centres equipped with automated banking machines¹⁴ have helped to address the public’s need for basic banking services. Banks have also introduced Video Teller Machines allowing bank staff stationing at customer service centres to engage in real-time conversations with customer through videos and provide interactive banking services. The introduction of VBs can help further improve financial inclusion in terms of remote onboarding arrangements and lower cost for customers to open and maintain bank accounts.¹⁵

19. The rapid expansion of fintech in payment, clearing and settlement adds challenges to the HKMA. The fintech evolution in the HKSAR is being driven by technology players that are bringing new business models to the payment and settlement landscape, challenging the conventional way of clearing and settlement of financial transactions. Furthermore, these innovative business models based on new technology challenge whether the current regulatory and supervisory oversight remains adequate. Fintech can have a positive impact on the financial market by increasing competition and expanding consumer choices as well as increasing efficiency in payment and settlement infrastructures. While spurring healthy innovation and harnessing the benefits of fintech, the HKMA is addressing the impact of fintech on the soundness, safety and efficiency of payment and settlement infrastructures.

Regulatory and Supervisory Approach to Fintech

20. The HKMA’s Banking Made Easy initiative was launched in September 2017 as one of the seven Smart Banking initiatives to review the regulatory requirements and practices in response to fintech development. A task force established within the HKMA consulted the banking industry and technology firms to assess necessary adjustments to regulatory requirements

¹³ A new era of smart banking: <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2017/09/20170929-3/>

¹⁴ Automated banking machines include Automated Teller Machines, Cash Deposit Machines, Cheque Deposit Machines and Passbook Update Machines.

¹⁵ In Hong Kong, VBs may not impose minimum account balance requirements or low-balance fees on their customers. Technology such as biometric solutions for identity authentication has been adopted to improve customer ease of access.

and practices in response to fintech development within the banking industry. The HKMA has subsequently updated a number of supervisory requirements, focusing on remote onboarding, online finance, and online wealth management.

- **For Remote Onboarding**, following amendment of the Anti-Money Laundering and Counter-Terrorist Financing Ordinance, the HKMA amended the relevant Guideline to allow banks to reduce unintentional barriers to the use of technology for remote onboarding¹⁶ and articulated to banks the key principles of identity authentication and identity matching for remote onboarding of individual customers in a circular of February 2019.
- **For Online Finance**, the HKMA allowed banks to adopt new credit risk management techniques such as big data and consumer behavioral analytics to improve the customer banking experience and uphold prudent credit underwriting standards. Banks are required to implement enhanced disclosure measures, in the form of “double reminder”, to mitigate the potentially higher risks of impulsive borrowing, over-borrowing or inappropriate borrowing decision of the customers in the online environment.¹⁷
- **For Online Wealth Management**, the HKMA sought comments from the SFC when providing guidance to the AIs on complying with the requirements pertaining to online distribution of investments products and collaborated with the IA to revise the requirements pertaining to online distribution of insurance products, reflecting a trend of AIs selling more investment products online, such as exchange-traded products, debt securities and investment funds; as well as selling more insurance products online, such as term life insurance products, non-participating endowment insurance products and certain refundable or renewable products that provide insurance protection (e.g. hospital cash, medical cover, etc.). The HKMA and the IA also collaborated to provide guidance on requirements of sandbox applications for using video conferencing tools in the sale of insurance products.

The HKMA has also refined and introduced new supervisory requirements in response to industry developments and changing risk landscapes. A list of new or revised requirements is at Annex 1.

21. The HKMA adopts a risk-based and technology-neutral approach to fintech regulation, supervision and its oversight of payments and settlement infrastructures. With regard to its regulatory function, the HKMA monitors and manages the risks arising from fintech payment and settlement activities in accordance with its established oversight framework and guidelines. For example, it created Stored Value Facility (SVF) licenses to regulate SVF issuers with proportionate regulatory requirements. A set of Supervisory Policy Manuals (SPM), circulars and other guidelines have been established to provide guidance to banks on technology risk management, cybersecurity,

¹⁶ More than 10 retail banks have launched remote account opening services by using various technology solutions of identity authentication and identity matching (for example, facial recognition, liveness check and optical character recognition).

¹⁷ Specifically, banks are required to provide clear and prominent disclosures and obtain customers' confirmations of understanding in respect of (1) key product features as well as terms and conditions of that credit product in general; and (2) key details on the specific credit product (i.e. unsecured loan and/or credit card product) that will be applicable to the borrower, or that the borrower applies for, and educational messages on responsible borrowing. See <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200904e1.pdf> for details.

operational risk management (ORM), outsourcing, business continuity planning, etc. For instance, the HKMA issued guidelines in 2018 and 2019 to allow AIs to adopt new credit risk management techniques such as big data and consumer behavioral analytics for a portion of their personal lending portfolio. As of July 2020, ten AIs have rolled out such online personal lending products¹⁸ and more AIs are planning to roll out similar online lending services.

22. Within the HKMA, supervisory activities related to AIs' fintech activities are handled by multiple departments as if fintech were an operating business. Fintech activities can have implications on different supervisory aspects (e.g. institutions' business strategies and governance, use of technology for financial risk management or regulatory compliance, technology and ORM). In 2019, there were 22 staff in the technology risk specialist team of the Banking Supervision Department (BSD) focusing on the policy and supervision of technology risk covering fintech services (including the operations of the FSS, supervisory issues related to the implementation of Open API Framework); and over 20 staff in other teams dealing with fintech-related case management matters or supervision of fintech-driven specialist risk management areas (e.g. credit risk management or treasury risk management). Fintech-related consumer protection policy issues of banks are primarily handled by the existing consumer protection policy team of the Banking Conduct Department (BCD). To foster a collaborative AML/CFT regulatory technology ecosystem, the AML Division has a dedicated team responsible for engaging with the banking industry and they cover fintech related money laundering/terrorist financing matters in the banking sector.

23. With respect to relevant fintech initiatives in response to COVID-19, the HKMA acknowledges that COVID-19 impacts the normal operations of the AML/CFT systems and the customer due diligence processes of AIs. Thus, the HKMA fully supports the AIs' remote customer on-boarding initiatives and digital delivery of financial services abiding with social distancing requirements. Concurrent with the FATF's latest statement on AML/CFT supervision amidst the pandemic, the HKMA issued a circular in April 2020, setting out the HKMA's support, guidance, and assistance. AIs are encouraged to continue working closely with the HKMA to provide greater availability to essential banking services during the pandemic.

Fintech Monitoring

24. The HKMA does not have direct authority to supervise non-bank fintech companies. InvestHK collects fintech-related data on a regular and ad-hoc basis and shares the latest fintech trends with the HKMA. If fintech firms use the word "bank" in their names or websites, or mention the taking of "deposits" when describing their products and services, the HKMA will be prompted to require the relevant fintech firms to remove the misleading representations, issue a public alert on the unauthorized or suspicious website and report the potential breaches of the Banking Ordinance (BO) to the local law enforcement.

25. The HKMA monitors overseas and local fintech developments and their potential impact on the HKSAR banking sector through a number of channels including: participation in various international fora to collect useful insights on latest fintech development; FSS, fintech supervisory chatroom for ongoing dialogue with the fintech community; collection and analysis of

¹⁸ For instance, several banks have since adopted data-driven income estimation models to inform credit underwriting and lending decisions.

fintech-related statistics (e.g., online banking, cloud computing, artificial intelligence application) and via surveys or questionnaires. The HKMA uses various channels to communicate with fintech/TechFin firms, both directly and through financial sector firms.

26. While the HKMA has observed healthy growth for both incumbents and challengers in the HKSAR, it is also likely that AIs will find it increasingly difficult to maintain their current operating model. The nature and scope of banking risks may also significantly change over time with the growing adoption of fintech. From an operational perspective, AIs may rely more on third-party service providers (TSPs) for technology and operational support or partner with fintech firms (e.g. under the Open API Framework) to offer financial services. If the competitive pressure from fintech firms is not properly managed, there will be a growing risk of AIs losing direct relationships with their customers or being displaced by fintech firms that are able to provide a better customer experience and tailor-made financial services.¹⁹ In addition, as incumbent banks continue to rely on, or partner with, technology firms, these relationships may pose new exposures to cyberattacks or fallout should a major technology firm suffer significant financial or operational failures.

27. The HKMA requires senior management of AIs to assess the relevant strategic risks facing their institutions and develop suitable plans to monitor and manage such risks on an ongoing basis.²⁰ The assessment should also be presented to AIs' board of directors for deliberations. The HKMA also performed an impact study on the potential reduction of banks' income in its recent financial stability report.²¹ In addition, where necessary, a thematic review on AI's fintech activities may need to be considered with focus on potential risks from banks' increased reliance on data analytics, complex algorithms and other black-box tools such as unsupervised learning. Supervisors should have relevant skillsets and resources for supervising such developments.

Sandbox

28. The HKMA launched the FSS in 2016 and upgraded it to FSS 2.0 in 2017 to allow banks and their partnering tech firms to conduct pilot trials of their fintech initiatives. The enhanced FSS 2.0 has new features including (i) a fintech supervisory chatroom to provide feedback to banks and tech firms at an early stage of their fintech projects, (ii) tech firms can access the sandbox by seeking feedback from the HKMA through the chatroom without going through a bank and (iii) a single point of entry for pilot trials of cross-sector fintech products. The operating principles, usage of the FSS, cross-sector fintech services, and cross-border pilot testing arrangement through the Global Financial Innovation Network (GFIN)²² applications are described in detail on the HKMA webpage.²³

¹⁹ <https://www.bis.org/bcbs/publ/d431.pdf>

²⁰ The HKMA issued a circular to draw banks' attention on the strategic risk posed by fintech development in 2018.

²¹ <https://www.hkma.gov.hk/eng/data-publications-and-research/publications/half-yearly-monetary-financial-stability-report/202003/>

²² GFIN aims to create a framework for co-operation among financial services regulators on innovation-related topics. GFIN now has a total of 50 members.

²³ <https://www.hkma.gov.hk/eng/key-functions/international-financial-centre/fintech/fintech-supervisory-sandbox-fss/>

In particular, the sandboxes of the HKMA, the SFC and the IA are connected so that there is a single point of entry, thereby facilitating pilot trials of cross-sector fintech products. As of end November 2020, 189 pilot trials have been conducted in the sandbox, with 175 trials completed and 132 initiatives fully launched after their trials. The HKMA's sandbox testing is primarily bank-led, with many conducted in partnership with fintech companies. Standalone fintech companies cannot perform testing in the sandboxes. For example, a fintech company that developed a new biometric authentication solution cannot test its solution through the sandbox, unless it is making a partnership with financial institutions. This may potentially limit the ability of start-ups to define a market space in the banking sphere.

Table 6. Hong Kong SAR: Total Number of Products Tested/Being Tested in the HKMA Sandbox

Category	Accumulated figures as of end-2017	Accumulated figures as of end-2018	Accumulated figures as of end-2019	Accumulated figures as of November-2020
Biometric authentication	7	7	8	8
Soft token	3	4	4	4
Chatbot	2	2	3	3
DLT	4	5	6	6
API	0	5	10	13
RegTech (e.g. remote onboarding)	0	4	42	95
Mobile app enhancement	0	0	10	13
Other	12	15	20	47
Total	28	42	103	189
Source: HKMA.				

Domestic and Cross-border Fintech Collaboration

29. The HKMA collaborated with the SFC and the IA on fintech matters particularly focusing on AI's conduct-risk related matters. For instance, in 2018 the SFC, in consultation with the HKMA, provided guidance to the industry on online distribution and advisory platforms for investment products. As another example, the HKMA has been working with the SFC to launch a joint annual survey on the sale of non-exchange traded investment products for registered institutions and licensed corporations. In light of the market developments, the joint survey will also collect information on investment products sold through the online platforms and/or purchased by clients who used robo-advice. For insurance products, in 2020 the IA and the HKMA collaborated to provide guidance on requirements of sandbox applications for using video conferencing tools in the sale of insurance products, and have been working closely in reviewing InsurTech sandbox applications involving AIs for non-face-to-face sale of insurance products (e.g. via video-conferencing tools or online platforms such as internet banking or mobile applications).

30. The HKMA and the SFC monitor closely fintech issues relating to FMIs. Both authorities are monitoring the development of fintech FMIs' related projects. Depending on the stage of fintech developments at FMIs, both authorities will, if considered necessary, discuss the need to cooperate closely in reviewing the regulatory framework and assessing the implications of fintech for them.

31. The existing international cooperation arrangements between the home regulators and the host regulators remain effective, in terms of supervision of the banking sector's fintech products. Material supervisory issues (including those related to cybersecurity or fintech) that require the attention or collaboration of both the home and host regulators would be raised at supervisory colleges or at bilateral meetings between regulators or other supervisory contacts, in accordance with established Memoranda of Understanding or similar agreements for the purpose of cross-border supervisory cooperation.

32. The HKMA has actively fostered cross-border collaborations. For example, it has entered into fintech co-operation agreements with ten jurisdictions and co-founded GFIN.²⁴ The HKMA has also been facilitating cross-border trials in trade finance and central bank digital currency (CBDC). The HKMA also regularly organizes industry events such as the annual Fintech Week event for foreign investors to liaise with local firms and provide fintech firms with a global platform. For example, the 2019 series of the HKSAR Fintech Week attracted over 12 000 participants from over 60 economies. Also, the HKMA participates in the G20/Organization for Economic Co-operation and Development Task Force on Financial Consumer Protection, which is updating the effective approaches to financial consumer protection, especially in relation to digital financial services. In another collaboration effort, the Bank for International Settlements (BIS) and the HKMA signed an Operational Agreement on the BIS Innovation Hub Centre in the HKSAR in September 2019. In addition, the HKMA also participates in the various international forums, such as CPMI, Executives' Meeting of Asia-Pacific Central Banks to exchange views on fintech and FMI matters.

33. In particular, the HKMA has initiated several cross-border fintech-based FMI projects with several authorities in other jurisdictions, aimed at strengthening collaboration in the development of fintech services. Latest initiatives being pursued include initiation of a cross-border payment system, Inthanon-LionRock, with the Bank of Thailand (BOT). It is also facilitating a Proof-of-Concept (PoC) trial which aims to connect HKMA's eTradeConnect and People's Bank of China (PBoC)'s trade finance platform to provide firms in both places with more convenient trade finance services. These initiatives are described in more detail in Section C of AREAS OF FOCUS below.

RegTech and SupTech

34. RegTech is receiving increased attention. The HKMA announced in September 2018 a series of initiatives to facilitate the adoption of RegTech by the banking sector focusing on AML/CFT surveillance technologies, prudential risk management and compliance, and a study on machine-

²⁴ The organizations that the HKMA entered into agreements with include the Financial Conduct Authority of the United Kingdom in December 2016, Shenzhen Municipal Financial Regulatory Bureau in June 2017, Monetary Authority of Singapore in October 2017, the Dubai Financial Services Authority of Dubai International Financial Centre in December 2017, the Swiss Financial Market Supervisory Authority in January 2018, the Polish Financial Supervision Authority in March 2018, the Financial Services Regulatory Authority of Abu Dhabi Global Market in June 2018, the Central Bank of Brazil in September 2018, the BOT in May 2019, and the Autorité de Contrôle Prudentiel et de Résolution in July 2019.

readable regulations. An ad-hoc survey to all banks was conducted in June 2019 to understand the extent to which banks and SVF licensees were leveraging RegTech applications to manage ML/TF risks. A growing number of RegTech users were observed in the areas of AML/CFT surveillance,²⁵ cyber security, fraud monitoring, credit risk management and regulatory compliance. The HKMA has also opened up the FSS to RegTech projects. Discussions on machine-readable regulations are currently ongoing and still at an experimental stage.²⁶ In November 2020, the HKMA developed a RegTech promotion roadmap to foster a larger and more diverse RegTech ecosystem²⁷.

35. The HKMA is actively adopting SupTech to support and enhance supervisory processes and activities. The HKMA is keen to explore the use of SupTech to further enhance the effectiveness and forward-looking capability of its supervisory processes. In particular, SupTech may streamline Als' regulatory data collection mechanism through digital transformation. In this context, the HKMA commissioned a consultancy study in April 2019 to identify possible strategies and roadmaps for the development and implementation of SupTech. The study was recently completed and identified three main directions for SupTech adoption in the next few years:

(a) Development of a Unified Authorized Institution Supervisory Platform with Smart Knowledge and Data Management technologies that interfaces with the HKMA's internal centralized data base and external data sources.²⁸

(b) Development of efficient supervisory processes through process digitalization and automation by using technologies such as Robotic Process Automation and Speech-to-text Tool.²⁹

(c) Enhancing forward-looking supervision via the use of Machine Learning, Network Analytics and Big Data Analytics to enhance capabilities in identifying emerging trends and risks, as well as monitoring financial interconnectedness.³⁰

36. In particular, the HKMA is setting up a “Digitalisation Office,” which will be tasked with overseeing its digital transformation to become a more data-driven regulator.³¹ The

²⁵ The HKMA hosted the first AML/CFT RegTech Forum in November 2019, published a Record of Discussion for the event in December 2019, and launched the RegTech Watch, in November 2019 to share observations about RegTech use cases with the banking industry.

²⁶ An ad-hoc survey was conducted in August 2019 on 24 Als to assess whether there were potential areas of regulatory requirements where the application of machine-readable regulations could enhance compliance processes (e.g. in terms of cost reductions and quality improvement). The results of the survey will guide a feasibility study on machine-readable regulations currently conducted by the HKMA.

²⁷ <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/11/20201103-3/>

²⁸ The Platform will provide supervisors with ready access to up-to-date and comprehensive information of banks, such as the profile information of banks and their senior management, financial positions, risk assessment results, major supervisory issues, and supervisory plans.

²⁹ The applications include using RPA to automate data collection and calibration, as well as generation of standard reports; and using natural language processing in monitoring mis-selling processes of financial and investment products.

³⁰ In this connection, the HKMA is in the process of exploring the use of these technologies in its supervision of corporate credit risk and liquidity risk.

³¹ <https://www.hkma.gov.hk/eng/news-and-media/insight/2020/01/20200121/>

HKMA's digital transformation covers multiple functions, including banking supervision, AML/CFT, financial stability surveillance, economic research, and reserves management. The office is recruiting talents in data science to work on data processing and analysis, formulate a long-term digital development strategy and promote a culture of technology and digital mindset within the HKMA.

Approach to Cyber Risk

37. The HKMA continues to observe increasing cyberattacks and technology crimes globally. Cyber risk is becoming more important from an operational and technology-related risk perspective for AIs, as they become more reliant on TSPs, partner with fintech firms and/or launch their own fintech products and services (e.g., Open API frameworks, remote onboarding, etc.). The key risks include phishing and business email compromise attacks (i.e. fraudulent transactions solicited through spoofed or compromised executive email accounts), and data breach attacks afflicting various industries including financial services.

Table 7. Hong Kong SAR: Number of Fraudulent Websites or Phishing Emails Reported by AIs to the HKMA					
	2015	2016	2017	2018	2019
Phishing Emails	3	4	7	62	51
Fraudulent websites	28	24	34	69	63
TOTAL	31	28	41	131	114

38. The HKMA undertakes on-site examinations and off-site supervisory activities to assess the operational/cyber resilience of AIs including their fintech products and services.

The HKMA expects AIs to establish preventative and responsive measures to effectively mitigate possible disruptions (e.g. natural disasters, failures of physical infrastructures, cyber or terrorist attacks). To further enhance the banking industry's capability of handling cyber events and operational disruptions, the HKMA participated in the planning and execution of an industry-wide crisis management exercise held in October 2019. The exercise provided an opportunity for the senior executives of banks to simulate expected responses to different risk scenarios covering significant cyberattacks and disruptions to critical infrastructures. Similar industry-wide crisis management simulations were held in 2015 and 2017.

39. The SPM "Operational Risk Management" provides guidance to banks on the key elements of effective ORM including information technology risk. The HKMA expects banks to have relevant policies and procedures in place for IT capabilities, security and change of IT systems, facilities and equipment. When AIs launch fintech products and services, AIs are expected to observe the above guidance on ORM and any other applicable guidance, including those issued by the HKMA in relation to specific fintech-related initiatives.

40. The HKMA implemented the Cybersecurity Fortification Initiative (CFI) in 2016 to increase the cyber resilience of the banking industry. The CFI is applicable to AIs' fintech products and activities and consists of three pillars: (i) Cyber Resilience Assessment Framework (C-RAF), which is an assessment tool to help AIs evaluate their cyber resilience through inherent risk assessment, maturity assessment and intelligence-led cyberattack simulation testing, (ii) Professional Development Programme, which seeks to increase the supply of qualified professionals in

cybersecurity, and (iii) Cyber Intelligence Sharing Platform (CISP), which provides an effective infrastructure for sharing intelligence on cyber attacks. The Cybersecurity Fortification Initiative 2.0 (CFI 2.0) was launched in November 2020 to respond to the latest trends in technology and incorporate recent development in global cyber practices.³²

41. Nevertheless, the CISP only allows access to the members of the HKAB (i.e., licensed banks in the HKSAR). Cyber risk challenges are relevant not only to licensed banks but also to other institutions. Provided that the members of the HKAB were comfortable, it may be desirable to open up the CISP to others like restricted license banks and deposit taking companies. There are suggestions that the platform be made available to securities and insurance companies, while the insurance industry is planning to establish its own cyber intelligence sharing platform. Authorities may consider exploring more ways to share cyber threats and intelligence across the financial sector.

42. With respect to the incident (including IT-related and cyber security) reporting framework, the HKMA has defined clear processes and formats on reporting. The HKMA has a standardized incident reporting form for AIs, which requires the AIs to exercise professional judgement in deciding whether an operational incident should be reported. The scope of cyber incidents includes suspected or confirmed cyber-attacks that may cause potential loss/leakage of sensitive data of the AI or its customers, potential financial loss to customers, potential material financial loss to the AI, or significant impact on the AI's reputation. AIs should promptly notify the HKMA of such incidents.

43. The current incident reporting timeframes are varied across the financial sector and could be aligned where appropriate. For example, AIs are required to submit the incident reporting form to the HKMA within the same day of discovery or the next working day if the incident is less time-critical and identified during late working hours or after office hours. Final updates should be reported within 4 weeks starting from the initial reporting date. AIs' risk management follow-up declaration should be submitted upon implementation of all rectification actions and preventive measures. For the insurance sector, insurers are required to report to the IA within 72 hours of detection all incidents relating to a system malfunction/cybersecurity issues, that have a severe and widespread impact on an insurer's operations or materially impact the insurer's service to its existing/potential policy holders.³³ The SFC's Code of Conduct requires licensed corporations and registered institutions to report any material failure, error, or defect in the operation to the SFC so soon as practicable upon identification.

44. Incident reporting is an important component of understanding the overall threat landscape of the financial sector and could be a trigger for supervisory action. Thus, financial institutions should know the exact incident reporting parameters to prevent critical information from being withheld. Financial sector regulators in the HKSAR would benefit from further collaboration toward sharing of common principles and good practices as well as further exchange of information on cyber/IT related incidents. It is advisable to review the adequacy of cyber/IT related incident reporting frameworks across sectors to ensure a common understanding in the financial sector on what to report, when, and in what level of detail. In the meantime, the authorities should ensure

³² <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/11/20201103-4/>

³³ https://www.ia.org.hk/en/legislative_framework/files/Guideline_on_Cybersecurity_English.pdf

current processes prevent under and late reporting, which hinders their ability to act promptly in a crisis.

45. Considering the cross-border nature of cyberattacks, the HKMA has also established bilateral cyber information sharing arrangements with two overseas regulators. The arrangements are intended to facilitate sharing of cyber threats and intelligence (including those arising from fintech) on a cross-border basis so that the HKMA may be better prepared to mitigate the potential risks of cyber threats on the HKSAR banking industry. The HKMA continues to take a proactive stance on the issue as evidenced by its recent participation in a cross-border multilateral cyber information sharing platform established for central banks and financial authorities; the platform is operated by the Financial Services Information Sharing and Analysis Center.³⁴

46. Banks are required to comply with the Personal Data (Privacy) Ordinance (PDPO) and relevant codes of practice issued by the Privacy Commissioner for Personal Data (PCPD). The PCPD is an independent statutory body established to oversee the enforcement of the PDPO and protect the privacy and personal data of individuals. Als are collecting and using more personal data to provide customers with tailored financial services; this is accentuated by fintech developments in the banking sector. The HKMA has engaged with the PCPD to provide more guidance to the banking industry on the proper collection, use, and storage of personal data. The PCPD has published good practices on fintech and Big Data Analytics and Artificial Intelligence (BDAI) such as the “Ethical Accountability Framework”, the “Data Stewardship Accountability, Data Impact Assessments and Oversight Models”, and the “Information Leaflet on Fintech”.³⁵ According to the circular issued by the HKMA in November 2019 regarding consumer protection aspects on the use of BDAI, banks are required to consider embedding data protection in the design of a product or system from the outset (i.e. privacy by design) and collecting and storing only the minimum amount of data for the minimum amount of time (i.e. data minimization)³⁶.

C. The SFC

General Approach to Fintech

47. The SFC has authority to regulate and supervise fintech activities provided they fall under its mandate as a securities and futures regulator. Under the Securities and Futures Ordinance (SFO), the SFC regulates and supervises the securities and futures markets in the HKSAR. Where the relevant activity amounts to a “regulated activity” under the SFO, or the relevant product involves “securities” or “futures contracts” as defined by the SFO, it may fall under the SFC’s jurisdiction. More generally, the SFC monitors fintech developments and maintains contact with the

³⁴ The platform is to exchange information in relation to cyber threats, vulnerabilities, incidents and other threat intelligence that could impact financial services, including those attacks that target central banks, regulatory and supervisory agencies. In addition, best practices concerning regulatory and compliance controls would also be exchanged through this platform.

³⁵ <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20190503e1.pdf>

³⁶ <https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191105e1.pdf>

industry to ensure it is adequately fulfilling its mandate to ensure the integrity of the markets it supervises, to protect investors and to reduce systemic risk.

48. The SFC has set its fintech focus on the activities it considers potentially riskier. Overall, the SFC takes a facilitative approach to innovation when fintech can be used to provide better customer experience, increase financial inclusion or make markets more efficient and reliable. Where a fintech activity poses serious risks to investors, the SFC takes a more cautious stance. This is the case of VA activities, which are associated with risks arising from illiquidity, volatility, opaque pricing, hacking, money laundering and fraud, and where the SFC has taken a more active and prudent approach (please refer to section H below).

49. Fintech work is coordinated by a dedicated fintech unit but staff from functional divisions is also regularly engaged on fintech-related matters. The fintech unit of the SFC is responsible for (i) formulating fintech policies; (ii) acting as the first point of contact for fintech related enquiries (via Fintech Contact Point (FCP), see below), (iii) coordinating with different divisions within the SFC; and (iv) engaging the industry and overseas regulators on fintech related matters. The fintech unit currently has five staff members, but staff from other divisions also work on fintech-related matters, such as in the Intermediaries Supervision Department formulating policies in new technologies used by licensed corporations and the Enforcement Division carrying out work with the Data Analytics Group (DAG) on the application of data analytics in the identification of conduct risks. The number of staff members dedicated to fintech matters will vary depending on the projects or issues in progress at any given time.

Industry Contact and Sandbox

50. The SFC channels fintech related matters through the FCP. The Contact Point was established to manage communication with business involved in the development and application of fintech which intend to conduct activities regulated under the SFO in the HKSAR³⁷. The SFO requires that a license be granted by the SFC to carry out any regulated activity and the FCP aims to facilitate the fintech community's understanding of the current regulatory regime, as well as to enable the SFC to stay up to date on the fintech developments in the HKSAR. This is carried out through the regular meetings of the Fintech Advisory Group (FAG), composed by both staff of the SFC and industry members, which is aimed at facilitating the FCP (i) obtain information on the latest trends of fintech; (ii) collect stakeholders' input on specific themes; (iii) identify opportunities, risks and regulatory perimeter implications of fintech; and (iv) broaden the understanding of fintech as an evolution of the financial services industry. The SFC more generally communicates with the industry through events and seminars where it participates (e.g. Hong Kong Fintech Week) and also through FMIs during IT project implementations and direct contacts in specific occasions.³⁸

51. The SFC's Sandbox is intended to provide a confined regulatory environment for qualified firms to operate regulated activities under the SFO before launch on a fuller scale. Created in 2017, the Sandbox aims to enable qualified firms, through close dialogue with and

³⁷ The Fintech Contact Point is part of the Licensing Department of the Intermediaries Division.

³⁸ The SFC sends staff to the operation sites, data centers and users' premises to review the performance and/or governance of IT operations.

supervision by the SFC under the licensing regime, to identify and address any risks or concerns relevant to their regulated activities. The SFC, however, expects the great majority of applicants applying for a license under the SFO, including firms which make use of fintech in conducting their regulatory activities, to go through the normal license application process without the need to enter the Sandbox. The SFC will discuss with applicants if it considers that it should enter the Sandbox on a case by case basis, and this would likely depend on the need to impose more conditions due to the more innovative approach of firms and the need for a closer initial monitoring as described below.

52. The SFC's Sandbox has the following overarching features:

- a. **Eligibility.** Firms must be fit and proper, utilize innovative technology and be able to demonstrate a genuine and serious commitment to carry on regulated activities through the use of fintech. Any firm carrying out SFO regulated activities must be licensed by the SFC; accordingly, start-up firms must apply for and obtain the appropriate license.
- b. **Licensing conditions.** In order to minimize risks to investors during the period a qualified firm operates in the Sandbox, the SFC may impose licensing conditions. These may include limiting the types of clients the firm may serve, or maximum exposure of each client, as well as putting in place appropriate compensation schemes for investors.
- c. **Closer monitoring and supervision by the SFC.** The SFC may engage in more intensive dialogue with firms and may highlight compliance areas where they can further improve their internal controls and risk management.
- d. **Investor protection measures.** Firms are expected to have adequate investor protection measures in place to address actual or potential risks or concerns identified when they operate in the Sandbox.
- e. **Exit.** Once a firm has demonstrated that its technology is reliable and fit for purpose, and its internal control procedures have adequately addressed the risks identified, the firm may apply to the SFC for removal or variation of some or all of the licensing conditions imposed, so that it can conduct its activities and be subject to supervision by the SFC on the same basis as licensed corporations outside of the Sandbox. If the SFC considers a firm in the Sandbox is not fit and proper to remain licensed, its license may be revoked.

53. There are currently three licensed corporations operating under the Sandbox. The first company provides trading services on trade receivables in the HKSAR and the other one is an equity fundraising platform. Both firms went through an initial onboarding process, which involved discussions with the FCP and, subsequently, the licensing department, to understand the business model and determine the specific licensing conditions to be imposed (professional investors only, maximum amount to be invested and closer SFC monitoring including monthly reports on specific issues). These firms have been in operation for about one year and are still refining their business model in close dialogue with the SFC. Once their operations have run smoothly for some time, the firms will be able to apply for the uplifting of the additional licensing conditions and migrate from the sandbox into the general SFC supervisory regime. The SFC expects VA trading platforms to be

the next to enter the Sandbox and are currently processing the application of a few firms under the new regulatory regime.

Fintech Monitoring

54. The SFC monitors fintech developments through its outreach initiatives, as well as through desktop surveillance and international cooperation. Mainly, the SFC maintains ongoing dialogue with the industry via a number of channels, including the FCP and the Fintech Advisory Group described above, as well as industry events and ongoing contact with FMs. It also typically conducts soft consultation with industry whenever formulating any policy, to ensure it stays abreast of latest developments and is able to identify opportunities, risks and regulatory implications. The SFC also gathers intelligence from public sources as well as from investor complaints and regularly monitors the latest developments in relevant activities, including VAs and artificial intelligence/machine learning. Separately, the SFC participates in various international fora to monitor and respond to the development and application of fintech to the financial market, including IOSCO fintech initiatives and also the GFIN, where both the HKMA and the SFC are members (see paragraph 29 above for details)³⁹.

SupTech

55. The SFC is increasingly deploying SupTech and expects to continue the trend to a more proactive and forward-looking supervision that relies on better data collection and sophisticated analytics, as well as greater storage and mobility. Through the FAG, the SFC generally monitors fintech developments, including for SupTech. But more specifically, the SFC has three standing initiatives focusing on addressing technological developments to improve the SFC's supervision, explained below. We encourage the SFC to continue strengthening its dedication to SupTech and RegTech to keep abreast of potential improvements to its regulatory and supervisory approach

- a. The DAG aims to study, identify and apply new data analytic technologies and techniques to help the SFC develop new insights about the various segments of the capital market through data trends, alerts, anomalies and relationships. It has a number of ongoing projects, including a key risk indicator (KRI) platform to enhance monitoring and supervision of global financial institutions in the HKSAR by standardizing the submission of their risk data indicators. The KRI platform will automatically and consistently analyze data submitted by licensed corporations, conduct and prudential risk profiles of each firm will be presented in the dashboard with alerts of high-risk areas identified for supervision.
- b. The Market Intelligence Program focuses on finding solutions for three priority conduct risk areas: collusion between parties (e.g. market manipulation, insider dealing), networks of companies and nominees (share warehousing, vote rigging). The SFC has implemented an Intelligence Relationship Identification System (IRIS), a graph database that enhances its capability to search for and visualize connections among people and entities. Launched in March 2019, the IRIS will gradually incorporate external data sources with the SFC's internal structured

³⁹ The SFC has also entered into seven bilateral fintech cooperation agreements with foreign counterparts.

and unstructured data, using natural language processing, machine learning and other relevant technologies.

- c. In July 2019, the SFC issued the Data Standards for Order Life Cycles which prescribe the minimum content and presentation format of trading-related data to be submitted by licensed corporations upon request by the SFC. The SFC is currently developing data analytics capabilities to perform automated compliance assessment steps to identify red flags of potential trading-related misconduct or control deficiencies in different areas such as short selling and best execution in the course of conducting supervisory work. The expected implementation timeline is H2 2021.

Approach to Cyber Risk

56. The SFC considers cyber risk as one of the key threats to financial institutions in Hong Kong, including central counterparties (CCPs) and regulated entities. To ensure it stays up to date on risks and measures to manage those risks the SFC has enhanced communications with the CCPs, IT vendors and other regulated entities to ensure adequate cybersecurity measures are implemented, and that they comply with international guidance or agreements (e.g. IOSCO Cyber Resilience Guidelines). From a regulatory standpoint, principal requirements have been included in the Code of Conduct for financial corporations to employ adequate and appropriate security controls to protect electronic trading systems. The SFC further issued the cybersecurity guidelines in October 2017, which mandate internet trading firms to implement 20 baseline cybersecurity controls, such as two-factor authentication for system login and strong data encryption. A thematic review was completed to ascertain if internet brokers complied with the cybersecurity guidelines, with additional focus on assessing security controls of mobile trading applications. The SFC issued a circular and the thematic review report in September 2020 which summarized key findings and observations and provided guidance of our expected standards. Separately, in light of the increased use of remote office arrangements, a circular was issued in April 2020 which remind licensed corporations to assess their operational capabilities and implement appropriate measures to manage the cybersecurity risks associated with these arrangements. Particularly for VAs, the SFC issued the “Pro forma terms and conditions for licensed corporations which manage portfolios that invest in virtual assets” that set out the principal requirements of security controls that virtual asset fund managers are expected to implement to protect their systems. Also, the SFC has formulated an assessment framework for the oversight of FMI’s operational activities and services, including engaging in regular and ad-hoc meetings. It also asks for regular reports on the risk assessment, cybersecurity measures and follow-up work.

Investor Education/Financial Literacy

57. The SFC has kept investor education efforts on fintech matters a priority, through the Investor and Financial Education Council (IFEC). IFEC is a wholly owned subsidiary of the SFC which is dedicated to improving financial literacy in the HKSAR. In 2018, the HKSAR Government and IFEC, with support from the SFC, launched a public education campaign on risks associated with ICOs and cryptocurrencies⁴⁰. As part of the campaign, a series of advertisements were placed in

⁴⁰ <https://www.info.gov.hk/gia/general/201801/29/P2018012900374.htm?fontSize=1>

subway stations and digital media. There were also television and radio advertisements, as well as educational videos which were shared on popular social media platforms. In addition, the Chin Family website, the financial education platform of the IFEC, has developed a range of educational articles and infographics to help the public understand the features and risks of ICOs and cryptocurrencies. The SFC will continue to use IFEC as a platform to address any investor education needs arising from fintech in relevant areas.

D. The IA

General Approach to Fintech

58. Overall, digitalization in insurance activities has been slower than in other sectors and the IA is actively encouraging the industry to increase their digitalization. Until recently, the emergence of fintech firms in the insurance sector had meant mainly streamlining procedures and compressing cost structures but in a limited scale. Both the industry and customers relied heavily on agents for the distributions, and thus direct online channels are quite limited.

59. The adoption of fintech by the insurance industry generally aims at improving productivity and customer experience. Examples of this are two applications conceived by the Hong Kong Federation of Insurers: Motor Insurance DLT Based Authentication System (MIDAS) and Insurance Fraud Prevention Claims Database (IFPCD). MIDAS deploys blockchain to tackle the problem of fake documents in the motor insurance market by enabling vehicle owners to authenticate cover notes and policies. IFPCD leverages on BDAI to help underwriters detect suspicious claim patterns, starting with motor, health and personal accident policies, to be followed by life and travel policies. Other notable fintech innovations include chatbots that simulate human interaction, facial recognition technologies that assist in identity verification for e-Know Your Customer, artificial intelligence systems that streamline claim management and automate services and big data analytics improving persistency, risk profiling and precision pricing.

Industry Contact and Sandbox

60. The IA established the InsurTech Facilitation Team as an interface with external stakeholders. It functions as a contact point for general enquiries and provision of advice, aiming to promote awareness and enhance understanding on technology advances, while assisting interested parties to tackle regulatory issues. The IA also maintains close contact with the industry through the Working Group on Embracing Fintech underpinning the Future Task Force, a conduit for disseminating information, forging partnerships and sharing experiences. It has also signed three bilateral fintech cooperation agreements with foreign counterparts.

61. The IA has launched two key initiatives in the past years: Insurtech Sandbox and Fast Track scheme.

- a. The Insurtech sandbox provides a platform for authorized insurers to run pilot trials of innovative applications in a controlled environment demonstrating that they could broadly comply with prevailing regulatory requirements. The IA expects that adequate safeguards on the interests of consumers and exit strategy should be embedded into all trial projects. Nine applications have been approved through the Insurtech Sandbox thus far, six of which were

successfully rolled out to the market. All of them are concerned with selling of long-term insurance policies through a digital platform without involvement of intermediaries or with a streamlined process. The IA anticipates that this trend will accelerate and is contemplating the issuance of additional guidance on ethical use of artificial intelligence/machine learning.

- b. The Fast Track is a pilot scheme for expedited handling of applications for new authorization involving only digital distribution channels. A dedicated queue has been set up for this purpose without compromising regulatory requirements, and four cases have been approved thus far.⁴¹ As a measure of prudence, the IA requires that applicants under Fast Track intending to carry out long term insurance business must team up with a traditional player. These virtual insurers are using BDAI and machine learning for customer onboarding, marking and claims handling, moving on gradually into core business areas like underwriting and pricing.

62. The IA is proactively using the COVID-19 challenges to encourage the shift of insurance business model from saving oriented to protection focused products. The COVID-19 crisis has increased the speed of technological reforms of the insurance industry by forcing insurers to move into the virtual space. The IA is embracing this opportunity to spur changes, embarking on a three-pronged strategy led by temporary facilitative measures with alternative compliance requirements applicable to remote selling of designated insurance products, followed by approval of trial projects meeting full compliance requirements under the Insurtech Sandbox, and concluding with a shared-use platform for smaller market participants to launch cost-effective remote distribution solutions. The rippling effect is being felt with regard to license application, continuous professional development courses and qualifying examination for the intermediaries. Going further, increased focus could be given to exploring RegTech and SupTech developments and their potential to enhance the IA's regulatory and supervisory approach.

Approach to Cyber Risk

63. The IA has issued the Guideline on Cybersecurity outlining minimum standards for insurers. The Guideline is applicable to all insurers (including virtual and digital ones), covering a wide range of topics such as IT strategy and framework, governance, risk management and incident response. In particular, the insurers are required to designate qualified personnel and experienced professionals to take charge of their IT system infrastructures, functions, security and operations, and submit independent audit reports on their IT security controls annually.

AREAS OF FOCUS

A. Virtual Banks

Licensing

64. The issuance of the new licenses is a significant initiative aimed at enabling non-bank players with innovative digital business models to offer banking services. Objectives of this

⁴¹ In December 2018, the IA authorized the first life virtual insurer owning and operating solely digital distribution channels under Fast Track. In October 2019, the IA authorized the first non-life virtual insurer under Fast Track.

initiative include promotion of financial innovation and technology, and offering a new type of customer experience, and financial inclusion. The HKMA believes that the development of VBs will improve customer experience and promote fintech development and financial inclusion in the HKSAR.⁴²

65. The HKMA granted banking licenses to eight VBs in the first half of 2019 among 33 VB applications. It also issued a revised Guideline on Authorization of Virtual Banks (the Guideline) in May 2018 to facilitate the introduction of VBs.⁴³ The minimum paid-up capital requirement imposed is HK\$300 million, which is the same requirement as that for all licensed banks. Banks, financial institutions and technology companies may apply to own and operate a VB in the HKSAR.

66. The VBs come from a mix of different backgrounds: (i) two are joint ventures set up by established banking groups; (ii) one is formed by a local fintech firm; (iii) two have been established with the support of Mainland insurance firms; and (iv) the remaining three are established by Mainland technology firms (bigtech). A few VBs were formed under partnership between AIs and fintech firms (including through setting up joint ventures by incumbent banks with fintech firms). The issuance of the new licenses was a significant initiative aimed at enabling non-bank players with innovative digital business models to offer banking services.

67. If a VB is not owned by a bank or financial institution, the VB applicant should be held by an immediate holding company (IHC) in the HKSAR, with supervisory conditions imposed on the IHC. This is the same requirement for local AIs under section 70 of the BO. Among the 8 VBs authorized by the HKMA, 7 of them are held through an IHC incorporated in the HKSAR.

68. Greater clarity on the supervisory conditions to be imposed on IHCs holding VBs would be desirable for a more robust regulatory framework. The Guideline stipulates that the supervisory conditions to be imposed on IHC will “likely” cover requirements relating to capital adequacy, liquidity, large exposures, intra-group exposures and charges over assets, group structure, activities undertaken, risk management, fitness and propriety of directors and senior management and the submission of financial and other information to the HKMA. The conditions to be imposed on such ultimate holding companies (UHCs) tend to focus on containing the influence of the UHC on the locally-incorporated AI, and requiring regular submission of information and independent assessment reports by the UHC to facilitate the Monetary Authority’s understanding and assessment of the UHC group. While some supervisory requirements could be adapted to suit the business models of VBs, adding greater clarity on minimum supervisory conditions to be imposed would be desirable.

Business Model

⁴² “The Future of Commerce,” Consumer Payment Attitudes Study by Visa shows that consumers perceive benefits of virtual banks to be lower banking fees (62 percent); better interest rates compared to current offering (47 percent); and better user experience (32 percent).

⁴³ <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2018/05/20180530-3/>

69. The introduction of virtual banking has already gained traction and is promoting competition in the banking industry.⁴⁴ Many of the newly licensed VBs delayed their launch to the second half of 2020 due to the longer than anticipated lead time required to meet the relevant regulatory requirements as well as the COVID-19 pandemic impacting VB's preparation for launch of services. As of 30 September 2020, seven VBs have officially launched their services to the public, and the remaining one is conducting a pilot trial to a confined group of customers through the HKMA's sandbox mechanism. There is no hard deadline for the licensed VBs to launch their operations. To compete with VBs, incumbent banks are strengthening mobile services and accelerating digital financing based on fintech. Further, shortly after the HKMA granted licenses to the VBs, several large retail banks removed minimum balance fees for basic banking accounts.

70. The VBs generally plan to offer a basic suite of services (e.g. deposits, loans and fund transfers) at the outset and will place greater focus on new customer experiences. In the medium to longer term, VBs aim to gradually expand into other services, such as wealth management and insurance product sales. Certain VBs also plan to offer cross-border services such as cross-border payments and remittances. With respect to customer scope, the VBs are expected to focus on serving retail customers (including small- and medium-sized enterprises) in the HKSAR in the initial years of operations. They should consult the HKMA if they intend to promote or provide banking services targeting potential depositors or other customers residing outside the HKSAR.

71. The HKMA expects that the VBs will be relatively small players in the HKSAR banking sector in the initial years of operation. According to the VBs' financial projections submitted as part of their license applications, their total deposits in the first few years of operation will correspond to only a small portion of the aggregate retail customer deposits of the existing conventional retail banks in the HKSAR.

72. The HKMA's preliminary analysis suggests that it is not likely that the introduction of VBs will trigger price wars or other aggressive behaviors that would affect banking stability, although some short-term competitive pressures and talent poaching may arise.⁴⁵ VBs can help enhance the overall competitiveness of the local banking sector over time by adopting the latest fintech solutions and employing more flexible operational processes. The increased competition may undermine incumbents' fee-income; on the other hand, this may inspire incumbent banks, especially the small- to mid-sized banks, to become more competitive and facilitate fintech development of the banking industry in the process.

73. Staff supports the HKMA's plan on conducting a comprehensive assessment of VBs' business performance and their impact after the first group of licensed VBs have officially launched services. VBs may utilize big data and behavioral assessment in credit assessments to facilitate provision of loans to individuals and micro and SMEs by easing the burden of providing financial records. Presently, while VBs have started applying big data to machine learning models for

⁴⁴ One in two Hong Kongers are likely to open an account with a virtual bank with one-tenth saying they will definitely do so, according to a study by Visa. <https://fintechnews.hk/10841/virtual-banking/one-in-two-hong-kongers-are-open-to-try-virtual-banks/>

⁴⁵ <https://www.scmp.com/business/companies/article/3046058/hong-kongs-virtual-banks-tempt-rate-war-za-bank-leads-juicy-68> ZA Bank offers up to 6.8 per cent three-month deposit for the first 2,000 clients and WeLab Bank may use promotional interest rates and other tools to win customers and build market presence.

underwriting and risk management, there are uncertainties about model performance (e.g. “through-the-cycle” robustness is yet to be seen). If the credit underwriting and lending decisions by VBs continue to rely on existing Credit Bureau data like incumbent banks, the differentiation would not be significant. With a weak differentiation, there is a possibility that VBs will aggressively build market share at the expense of recording losses in the initial years of operation. Further to the HKMA’s prudential guidelines on the use of new credit risk management techniques, close monitoring of the initial operations and comprehensive assessment on VBs’ medium to long term viability would be critical particularly before the processing of further licenses application.

Supervisory Approach

74. In principle, VBs are subject to the same set of supervisory requirements applicable to conventional banks. VBs are subject to the same set of micro- and macro-regulatory requirements (including Basel III requirements) that are applicable to conventional banks. VBs’ compliance with the regulatory requirements will also be monitored through the HKMA’s day-to-day supervisory processes. Specifically, before commencement of business, VBs are required to perform an independent assessment of their compliance with the relevant requirements, focusing on whether they have the relevant policies and procedures, sufficient management oversight and corporate governance standards as well as control and monitoring measures in place; in six months of the full launch of business, VBs are required to perform another independent assessment, this time focusing on the implementation of the relevant policies and procedures. Before business commencement, VBs are also required to conduct an independent assessment to evaluate whether adequate and effective risk management controls are in place to manage the technology related risks. VBs should also complete the maturity assessment under the C-RAF to evaluate their cyber resilience and take effective remedial actions to strengthen the relevant risk management controls. In addition, VBs should perform relevant self-attestation to ensure compliance with the security programs of interbank payment systems (including the SWIFT Customer Security Programme). The Case Management Divisions of BSD are responsible for day-to-day prudential supervision of the eight VBs, while the ongoing conduct supervision is primarily performed by the existing incident handling teams of the BCD.

75. The HKMA has identified three key risk areas that are more pertinent to VBs and will devote resources to supervising the banks’ management of these risks.

- **Technology Risk Management** – Technology risk management is of vital importance to VBs given their technology-driven business model and primary use of digital channels to deliver banking services. Accordingly, the HKMA requires, and will assess, whether VBs have put in place security and technology-related controls that are “fit for purpose”, or in other words, appropriate to the expected types of transactions.
- **Customer Protection and Data Privacy** – The general customer protection requirements applicable to conventional banks are equally relevant to VBs. For example, VBs will be expected to become signatories to the Treat Customers Fairly Charter and comply with the Code of Banking Practice. VBs face the possibility of higher data privacy risks, given that they are more likely to use big data and behavioral data analytics in the design and marketing of their products and services, as well as in risk management processes. Therefore, VBs will be required to put in

place appropriate safeguards, and implement measures to ensure compliance with the data privacy requirements in the HKSAR and embody the spirit of data ethics.

- AML/CFT – As VBs will primarily deliver banking services through the internet or other forms of electronic channels, their risk assessments should reflect specific risks associated with this model like impersonation risk, and ensure that controls are effective at mitigating these risks.

B. Third Party Risk/Outsourcing and Open Banking

76. The use of technology service providers is on a rising trend. According to a recent industry survey, 95 percent of the responding banks are developing artificial intelligence capacities through partnership with external technology firms. Over 100 AIs' business processes have been outsourced to Cloud service providers, but the vast majority of these processes are non-mission critical (such as customer relationship management, human resources). A few TSPs have been commonly engaged by some AIs but carry out non-core functions (e.g. statement printing). Major banks' mission-critical systems are generally hosted by the banks themselves or their intra-group companies.

Supervisory Approach

77. The HKMA established the SPM on outsourcing in 2001⁴⁶, which also covers banks' use of Cloud computing. Transition to Cloud services has been moving rapidly for advanced economies and HKSAR banks may be embracing this movement. As Cloud services continue to evolve, banks and service providers would benefit from clearer supervisory expectations on the use of cloud services particularly relating to their respective characteristics, controls, responsibilities of the board, and access and audit rights to cloud services, etc. Staff welcomes the HKMA's initiatives to examine industry practices through thematic reviews and consider updating the 2001 guideline where necessary.

78. The HKMA conducted a review of the supervisory requirements on outsourcing in 2016. As a result of the review and consultation with the banking industry associations, pre-notification requirements for material outsourcing initiatives were updated and additional outsourcing examples, including those related to the implementation of Open API, were provided to the banking industry. The definition of "material outsourcing arrangement" includes new material outsourcing arrangements and material changes to existing material outsourcing arrangements. The HKMA has provided guidance to AIs on determining the materiality of an outsourcing arrangement.

79. The pre-notification arrangement enables the HKMA to identify and assess the interconnectedness between AIs and fintech firms (including cloud service providers) through material outsourcing initiatives. AIs are required to submit the Risk Assessment Form on Technology-related Outsourcing (including Cloud Computing) Project for technology-related outsourcing initiatives (i) that are considered material outsourcing arrangements; and (ii) that meet

⁴⁶ <https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/supervisory-policy-manual/SA-2.pdf>

certain criteria.⁴⁷ Moreover, AIs are expected to appoint independent assessors (e.g. external or internal auditors) to assess the AIs' due diligence performed on the service providers (which could be other units of the same banking group or fintech firms) and their compliance with relevant guidelines before their material outsourcing initiatives are implemented.⁴⁸ Since 2015, the HKMA has identified more than 500 such interconnections between AIs and their outsourcing service providers.

80. The HKMA monitors and assesses material concentration risk of fintech firms through several channels. Under the pre-notification requirements, AIs must notify the HKMA of any material outsourcing arrangements before deployment. The HKMA monitors the material concentration risk of fintech firms engaged by AIs in their material outsourcing projects. The HKMA had discussions with major outsourced providers and cloud service providers regarding the HKMA's supervisory requirements and highlighted the importance of compliance with guidelines and privacy laws. A survey on AI's outsourcing activities was also conducted in 2017 to assess the concentration risk of AIs' dependencies on third party service providers. Since individual AIs do not have information to monitor the TSP concentration risk at the industry level, it is important for the supervisor to regularly monitor and assess whether such arrangements affect systemic concentration risk.

81. Upon deeper engagement between fintech firms and financial institutions, it would be useful to develop a methodology to recognize the degree of interconnectedness and concentration risk in a more systematic and comprehensive manner. Supervisors could aggregate the banks' registers of outsourced service providers to form a comprehensive picture of TSP across the system. The authorities have yet to map the network interdependencies between the financial sector and technology service providers. The HKMA would benefit from developing the financial sector map, in collaboration with other domestic sectoral regulators and the FSTB; this map would provide an overview of critical functions, organizations, systems, and service providers in the HKSAR financial sector. The financial sector map will help authorities identify and analyze potential systemic risks from key nodes, interconnections, and critical service providers; detect contagion channels relevant for financial stability; inform the risk-based supervisory and oversight approach of authorities; and enhance common tools and initiatives for critical players in the financial sector (e.g., crisis coordination and red-team testing).⁴⁹

Open Banking

⁴⁷ The criteria are as follows: the involvement of hosting, operation or administration of (a) critical systems or (b) systems that store, access or transmit consumer data; or the involvement of the use of public cloud or similar cloud computing arrangements.

⁴⁸ The outsourcing notification letter should have the confirmation statement that the AI has conducted an assessment and concluded that the proposed outsourcing arrangement complies with the relevant supervisory requirement of the HKMA, including exit management.

⁴⁹ <https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2019/09/23/Cybersecurity-Risk-Supervision-46238>

82. The HKMA adopts a collaborative approach in facilitating the development of the Open API⁵⁰ Framework. It allows banks and TSPs to collaborate to offer banking products and services that improve customer experience. A public consultation was held from January to March 2018, following which an Open API Framework was published in July of the same year. Open APIs are progressively implemented in four phases:

- **Phase One** (Product Information) – 20 retail banks launched over 500 Open APIs in early 2019 covering information of deposits, loans, insurance, investments, and other banking products and services. New third-party apps providing services have emerged, such as apps on product/pricing comparison, mortgage calculation, and FX rates translation. About 800 registrations from TSPs to access banks' Phase I Open APIs had been recorded in March 2019.⁵¹
- **Phase Two** (Customer Acquisition) – Third-party applications have been able to conduct customer onboarding and product application for banks since the end of October 2019. Banks are developing partnerships with TSPs since the launch in end-October 2019 and collaborative services have been gradually launched.
- **Phases Three** (Accessing Account Information) and **Four** (Conducting Transactions) – A set of technical standards on data definitions and payments transfer processes will be published in 2021, following which an implementation timetable will be set.

83. The HKMA has also facilitated the development of a common baseline on TSP management by working closely with the HKAB, TSP representatives and other interested parties. It contains the common requirements and risk management considerations that should be considered when selecting and monitoring TSPs. In particular, the HKMA has communicated its expectations that banks should (i) carry out onboarding checks on TSPs, (ii) conduct ongoing monitoring of TSPs; and (iii) enter into a bilateral contractual relationship with each TSP, in relation to each Open API collaboration with TSPs accessing Phase II Open APIs.

84. The HKMA is well aware of the importance of defining a more detailed set of standards for Phases III and IV Open APIs to facilitate their smooth implementation across the industry. The study will cover, among others, the legal implications of implementing Phases III and IV, and the roles and relationships of different stakeholders in the ecosystem including TSPs. The HKMA plans to prioritize completion of detailed guidance before establishing a timetable for Phase III and IV in efforts to increase reliability in the open banking system.

85. In October 2019, the HKMA issued a set of supervisory guidance, in the form of FAQs and circular on technology risk management controls, outsourcing arrangements and consumer protection in respect of Open API. It is critical for regulators to provide guidance to financial institutions regarding risk management and consumer protection measures for the

⁵⁰ Open APIs are used to build applications that connect to other firms' IT systems and technology. Banks with APIs enable fintech firms to build apps utilizing the bank's existing data infrastructure. (source: WHub).

⁵¹ As one of the large scale Open APIs, Joint Electronic Teller Services Limited (JETCO) launched the JETCO APIX exchange platform in 2019, which provides over 200 APIs from 13 banks. Meanwhile, other major banks like the Hongkong and Shanghai Banking Corporation and the Bank of East Asia formed partnerships to launch their own API platforms respectively.

implementation of Open APIs. This will not only protect the interests of customers, but also enhance customer confidence in using the relevant banking services and promote the healthy development of innovative technology in the banking industry. The circular issued on 29 October 2019 reminds banks to devise and adopt adequate consumer protection measures in Open API initiatives that are in line with the consumer protection principles in the Code of Banking Practice and comply with other applicable regulatory requirements. The HKMA also issued guidance on technology risk management controls in relation to the implementation of the Open API Framework.⁵²

86. Open banking is still a developing area and the ability of open banking to drive consumer demand remains to be explored. A collaborative approach where TSPs offer solutions under a partnership arrangement with banks may be appropriate for the HKSAR for the time being. Thus, the HKMA does not consider it suitable to prescribe rigid and detailed requirements on open banking at this stage. The HKMA requested that AIs adopt a risk-based approach. The relevant technology risk management control principles include, but are not limited to, (i) effective network segregation and access management, (ii) adequate controls over the confidentiality and integrity of information, (iii) effective monitoring and incident response, and (iv) robust capacity planning and business continuity management. The HKMA has additionally provided examples of sound practices having examined overseas experiences in implementing third-party system connections. In addition, the HKMA is conducting regular surveys on the partnership relationships between AIs and technology service providers via Open API implementation.

87. It would be critical to continue to closely monitor the progress of Open API implementation including how AIs manage the relevant risks and challenges going into Phases III and IV, and further consider the need to strengthen security and consumer protection if necessary. Fintech companies receiving customer data directly from AIs will have to comply with the same stringent data security standards of an AI. Although fintech companies as TSPs are not regulated by financial regulators, the Open API Framework introduced by the HKMA includes governance framework for on-boarding and on-going monitoring of the TSPs. In addition, the banking industry has also developed a set of common baselines for the on-boarding checks and on-going monitoring of the TSPs.⁵³ Nevertheless, many fintech companies involved in Open APIs are start-ups that may not be able to afford bank-like stringent cyber risk governance and controls (e.g., penetration testing) and other compliance requirements. The risks of using emerging technologies may not be well or immediately understood. When entering Phases III and IV, the HKMA may need to strengthen its monitoring and collect more comprehensive information on market participation in Open API including overall market share, size, number of transactions, change of customer base and growth rate of the Open API, its impact on the banking sector, etc. Staff welcomes the HKMA's plan to consider more regular surveys on the progress of and/or further thematic reviews.

⁵² In the FAQ on technology risk management controls, the HKMA laid out the key principles that should be considered by an AI in protecting its IT environment, including the corresponding systems, infrastructure and data, when it implements a system connection with a third-party firm.

⁵³ Regarding personal data, all data users, including banks, firms or TSPs partnered with banks, are required to comply with the privacy law (the PDPO), which is enforced and overseen by the data protection authority (the PCPD).

C. Payment Systems

HKMA's Fintech-based Initiatives

88. Several initiatives and projects of payment and settlement services are either based on fintech or include some elements of it. The main objective is to benefit from the new era of smart technology, promoting healthy competition, improving service level and strengthen the soundness of the payment and settlement infrastructure. This presents another challenge to the HKMA which is promoting its own projects and, at the same time, maintaining its neutrality as regulator and overseer of privately-operated systems. Key projects are summarized below.

FPS

89. A new faster (or instant) payment system was introduced in September 2018. The HKMA launched the FPS, operated by the Hong Kong Interbank Clearing Limited (HKICL).⁵⁴ The FPS operates on a round-the-clock basis and connects banks and SVFs, which is in line with the overall policy to open central bank account aimed at reducing credit and liquidity risks. As at end-September 2019, the HKMA has issued a total of 18 SVF licenses (including three banks with SVF business).

90. The framework includes different arrangements for banks and SVFs while the banks will maintain clearing and settlement accounts, the SVFs only have access to clearing accounts. The SVFs need to rely on banks for the settlement of their transactions. Each participant bank has a currency-specific FPS ledger account for settlement purposes (HKD and RMB, the two currencies supported by FPS). The FPS ledger account and the RTGS ledger account together constitute the settlement account each bank maintains with the corresponding settlement institution or clearing bank.⁵⁵

91. The HKMA also introduced the Common QR Code Standard for retail payments. A new mobile application tool was made available to convert multiple QR codes in compliance with the Standard from different payment service providers into a single, combined QR code. This would facilitate merchants in using a single QR code to accept different payment schemes, thereby promoting the adoption of QR code payments.

Central Bank Digital Currency (CBDC)

92. The HKMA concluded a study on whether to introduce CBDC. In March 2017, the HKMA, in collaboration with the three note-issuing banks in Hong Kong, commenced a study on CBDC (Project LionRock). The aim was to better understand the feasibility, benefits and risks of CBDC, and the study includes a PoC on token based CBDC and debt securities issued into a single DLT system

⁵⁴ HKICL is the system operator of Hong Kong's large-value payment systems, securities settlement systems for debt securities and trade repository.

⁵⁵ As of end November 2019, the FPS has processed 39 million transactions involving an aggregate amount of HKD 675 billion and RMB 16 billion.

through exploring its use in domestic interbank payments, corporate payments at wholesale level and delivery-versus-payment debt securities settlement.

93. The HKMA concluded that the potential use of CBDC for domestic retail payment remains limited, given the efficient payment systems available in the HKSAR. Furthermore, the proliferation of electronic payment products in (e.g. FPS, e-wallets, credit and debit cards, etc.) makes the prospects of issuing CBDC for retail payment purposes limited.

94. However, the HKMA considers that CBDC may have greater potential at the wholesale level and for cross-border payment. In particular, the use of CBDC in cross-border payments may eliminate the need to go through several layers of correspondent banks and enable non-bank entities to transact with each other directly, thereby reducing the cost of the inefficient correspondent banking model.

Project Inthanion-LionRock

95. In September 2019, the HKMA and the BOT jointly initiated a cross-border payment project, leveraging DLT to increase efficiency in cross-border payments and improve liquidity management between the two jurisdictions. The purpose of the collaboration is to facilitate payment versus payment among banks in the HKSAR and Thailand through a DLT based network, using CBDC. If the project is proven to be successful, the DLT-based network could possibly be scaled up to include other interested jurisdictions. Project Inthanion, initiated by BOT, explores the feasibility of DLT to enhance Thailand's FMI.⁵⁶

eTradeConnect

96. A DLT based trading platform has been launched since September 2018, after several enhancements introduced to the prototype addressing the feedback received from banks, as well as corporates and logistics service providers. Under the facilitation of the HKMA, a consortium of major banks in the HKSAR established eTradeConnect, which is an electronic trade finance platform based on DLT for digitizing the heavily paper-based and manual-intensive trade documentation and financing processes to enhance efficiency and reduce risks. Currently the consortium comprises 12 licensed banks.

97. The HKMA is working actively to enhance the functionalities of eTradeConnect and broadening its geographical coverage, aiming at enhancing the role of the HKSAR as a financing and fintech hub. Several interests to connect with the platform have already shown from outside the HKSAR. For instance, a PoC on the connectivity with we.trade, a European DLT-based trade finance platform, was completed in March 2019. Furthermore, the HKMA and the PBoC have established a working group to explore connecting the platform to PBoC's trade platform for the Greater Bay Area. A central bank in Southeast Asia has also indicated interest to make use of the platform.

⁵⁶ The Inthanion project is a collaboration with R3 and eight participating banks, a proof-of-concept was developed for domestic wholesale funds transfer using CBDC, issued by BOT.

Hong Kong Exchanges and Clearing Limited (HKEX) Fintech-based Initiatives

98. HKEX has embarked on several projects to adopt new technologies into its regulatory, trade processing and market surveillance activities, as part of the “Technology Empowered” pillar of its 2019-2021 Group Strategic Plan. Some initiatives are discussed below.

- *Smart contract for trade allocation.* HKEX is building a smart contract-powered multilateral workflow solution for the efficient allocation of trades performed on the ‘northbound’ Stock Connect channel that allows internationally-based institutions to transact in A-shares listed on the Shanghai and Shenzhen bourses through HKEX’s infrastructure. This solution helps connect brokers, custodians and asset managers with HKEX’s securities clearing house, enabling international investors to effect T+0 settlement processing for their onshore China equity trades.
- *Cloud computing.* HKEX has introduced a virtual private cloud to accommodate an increasing number of HKEX business applications and testing needs, as well as the launch of new market connectivity services such as API interfaces to various HKEX data sets. This strategy aims at providing high-security accessibility in a scalable and resilient environment.
- *Automation.* HKEX has launched a robotic process automation (RPA) programme that is designed to automate repetitive, manual processes across multiple applications. The programme has been in production since March 2019, and, with over 50 business processes automated to date, is delivering cumulative benefits in areas such as workflow acceleration; risk reduction; more efficient time usage; and better process control. The automation programme is focused on HKEX’s internal operations, although in some cases the benefits of automation extend to interactions with its participants, such as enabling faster dissemination of market circulars or processing of client data requests.
- *Artificial intelligence.* HKEX has designed and launched an artificial intelligence-assisted workflow platform that extracts corporate actions data from listed companies’ regulatory announcements, converts it into output files for market consumption, and facilitates a human quality check of the outcome. This platform achieves a 90 percent time saving in processing, and currently handles around 1,300 documents per week. A similar solution has been introduced to assess the listed companies’ compliance with HKEX’s Listing Rules on an annual basis. In addition, HKEX also uses artificial intelligence solutions for prioritising market surveillance alerts for investigation; tracking multilingual adverse news potentially affecting its members; and offering a conversational chatbot service to its clients.
- *Big data.* HKEX has introduced several tools to help with the structuring, visualisation and analysis of the large data sets that result from its activities as a market operator. These include an enterprise data lake; data wrangling and analytics tools; and specialist software to assist with the detection of relationships between HKEX’s counterparties for purposes including risk monitoring and market analysis.

Some Issues for Consideration

Fintech Coordination Policy

99. A rapidly changing payments and settlement landscape. Fintech in retail payment and settlement in the HKSAR, similar to many other jurisdictions, has been driven mainly by large overseas and Mainland based technological service providers. Independent of the geographical location of the service providers, there may be a risk that the ongoing reshaping of the payment and settlement infrastructure may in the long-run lead to a segmentation of the payment landscape due to the development of several closed-loop solutions, potentially leading to a higher cost for the economy as a whole. Furthermore, fintech-based products and services have the potential to exacerbate several risks related to money laundering and terrorist financing, cyber-resilience, and personal data protection. In the context, the HKMA needs to continue engaging actively with the private sector to better understand the complexity of the new services and products, their impact on financial stability, and if they come to fall under the regulatory perimeter.

100. An update of the jurisdictional fintech strategy is warranted. In 2017, the HKSAR authorities defined an overarching fintech strategy aimed at promoting the HKSAR as a leading center and a landing pad for fintech in the region. This strategy has served well in coordinating the jurisdictional efforts and defining priorities by involving all the relevant authorities including the HKMA, the SFC, the IA and others. As its fintech strategy, the HKMA may act as a facilitator to bring together private sector innovation in a more coordinated fashion with the existing infrastructure. The HKSAR already has a large financial industry with extensive, advanced and cost-effective payment and settlement infrastructure. To leverage on the existing infrastructure while maintaining an innovative environment, the HKMA could assume an active role in encouraging and enabling interconnectivity and interoperability between new fintech solutions and existing infrastructures, as long as it is beneficial for the economy as a whole. This can be done by increasing harmonization and compatibility through standards, guidelines and recommendations. Furthermore, the HKMA may actively encourage the provision of new fintech-based payment services to rely on the Faster Payment System.

Regulatory and Oversight Framework

101. The HKMA has the legal basis to regulate and oversee FMIs. In particular, the HKMA derives its regulatory and oversight function from the PSSVFO, with the aim of promoting the safety and efficiency of payment, clearing and settlement systems. More specifically, the scope of responsibilities of the HKMA includes (i) the designation and oversight of clearing and settlement systems and their links; (ii) monitoring the compliance of designated systems with the safety and efficiency requirements stipulated in the PSSVFO; (iii) instigating changes to designated systems to bring them into compliance with the requirements where appropriate; and (iv) issuing a certificate of finality to a designated system if it meets the criteria specified in the PSSVFO. FMIs are required to seek the approval of the HKMA under the PSSVFO for the adoption of any new technology that requires changes to their operating rules and procedures.

102. The HKMA may seek to review its oversight approach to designated payment systems taking into account implications arising from innovative technology entities. The HKMA's mandate to regulate, oversee and promote the smooth functioning of payment and settlement systems is relatively broad and not restricted by the underlying specific technology. However,

regulated payments and settlement infrastructures may rely on unregulated TSPs that operate the platform, cloud-based services, network, or other critical functions for the clearance and settlement. Furthermore, the entrance of a handful of BigTechs into the payment landscape by providing payment services, e.g. Alipay and WeChat, adds challenges as they are systemically important with millions of customers and sizable value and volume of payment transactions. BigTechs are providing services similar to “traditional” payment services, including bundling existing services to create new products. Moreover, some BigTechs offer cloud solutions to conventional payment service providers, posing systemic implication if these companies suffer financial or operational failures or the cloud provider is compromised, and no immediate alternative exists. The HKMA has the mandate to require the regulated entity to submit any necessary data and information related to its third-party providers or to issue oversight expectations.⁵⁷ However, this policy may have its limitations, as the information and data provided by third-party service providers may not be complete, filtered or partially selective. While there is a rationale for the HKMA to have direct access to third-party providers and BigTech’s payment service infrastructure in order to effectively carry out its oversight, there has yet to be international consensus on the regulatory remit and power. To this end, the HKMA may keep the matter under review and, where necessary, consider strengthening its legal basis to have the right to directly oversee unregulated third-party services related to payment and settlements having regard to international practices.

103. The decentralization and complexity of new technology creates regulatory, supervisory and oversight challenges for the HKMA. The regulatory and oversight regime of payment and settlement infrastructure in the HKSAR as well as worldwide typically emphasizes the centralized feature of the infrastructure, including centralized technical clearing mechanism, a trusted ledger, and hieratical governance structure. FMI typically establish a set of common rules and procedures for all participants, and a centralized and dedicated risk-management framework appropriate to the risks they incur. Due to its decentralization, the DLT-based payment solution would change the way assets (both cash and securities) are registered, cleared, settled and safekept. In particular, the rights and obligations of the involved counterparties, including the timing of discharged obligations can be ambiguous. Furthermore, the nodes and ledgers can be spread over several jurisdictions. The governance structure, including responsibility and accountability, may not be well-defined and effective. Moreover, the payment service providers may use cloud services, which are located in a different jurisdiction.

104. The HKMA may review the regulatory framework as fintech innovations are introduced in the payments and settlement space. The HKMA adopts a functional, risk-based and technology-neutral approach to regulate, supervise and oversee fintech based payment and settlement systems. The regulatory requirements are based on the intrinsic characteristics of the financial activities and transactions, aimed at addressing the associated risks. The criteria used by the HKMA to review and assess changes to fintech based initiatives are determined by the current safety and efficiency requirements under the payment systems ordinance and guidelines. However, the payment ecosystem is changing by the entrance of BigTech and the increased role of third-party service providers as well as the decentralized features of some functionalities. The current regulatory and oversight framework may have to be updated, in terms of risk sensitivity, completeness, and consistency across different types of payment services providers. To this end, the HKMA may

⁵⁷ See Annex F on Oversight expectations applicable to critical service providers. PFMI report 2012.

continue to assess whether the existing regulatory and oversight framework, remains adequate to address the challenges of a fast-changing and complex payment ecosystem, and how to identify, monitor and mitigate the inherent risks of fintech innovations. Furthermore, it needs to reflect over what mechanisms and channels need to be established with foreign host authorities in order to have access to the information on the cloud activities serving the HKSAR markets.

Legal Risk

105. According to the PFMI, an FMI should have a well-founded, transparent, and enforceable legal basis. When applying this requirement to decentralized and distributed arrangements across jurisdictions there is a need to identify the applicable law, which may or may not recognize the validity of the arrangements. It would also need to assess the potential of conflict of law and, thereby the enforcement of rules in a specific jurisdiction. In particular, the legal basis of the nature and ownership of the assets issued and settled by fintech based arrangements, as well as the enforcement of the obligations and rights of the involved parties would have to be clearly defined. Furthermore, the settlement finality should be well defined and legally supported.

106. Particular considerations could be given to the adoption of DLT and ensure with reasonable certainty that DLT-based services have an appropriate legal underpinning where applicable. The inroad of DLT in payment and settlement results in a highly complex environment that comprises several service providers, including unregulated entities, from potentially multiple jurisdictions. The legal basis of such arrangements and procedures may not be clearly defined or enforced in all jurisdictions, as DLT solutions may rely on a decentralized and distributed structure across several services providers, networks and jurisdictions. Furthermore, some DLT-based arrangements entail a certain latency to update and synchronize state changes to the ledger, and the settlement finality may not be well defined or achieved in good time. Moreover, the irrevocability of transactions will be depended on the probability and degree of consensus among the nodes, as well as the time passed. In a permission less DLT and through consensus process, participants still have the ability to revise transactions that had been previously added to the ledger. To this end, legal protection under existing law for such DLT-based services might be lacking or not well articulated. The HKMA needs to assess each specific business case to establish whether the legal basis, including settlement finality, can be ensured without ambiguity.

Governance Structure

107. The PFMI promotes the need for sound and transparent governance arrangements to promote the safety and efficiency of FMI. Furthermore, the governance arrangements of FMI should support the stability of the financial system, public interest considerations, and the objectives of relevant stakeholders. Moreover, governance has a significant impact on FMI's operational resilience and reliability. The roles and responsibilities, operational reliability objectives as well as potential vulnerabilities should be well defined and monitored. Furthermore, the relationship between owners, decision-making bodies, management, and relevant stakeholders should be clear and transparent.

108. DLT-based arrangements present challenges to the governance structure of payment and settlement entities. The nature of the decentralized process of executing a transaction increases the complexity of decision-making due to the different roles and responsibilities of the

involved stakeholders, including owners, board of directors, management, external services providers. It is important to consider the ownership and governance of all the components of a DLT-based arrangements which, for example, rely on an open-source code.⁵⁸ If a settlement failure occurs, questions may arise on the liability of the code provider or the payment and settlement entity. Furthermore, payments, and settlement activities may not be the core business of a fintech firm, leading to less focus on the soundness and safety of payment and settlement, and potentially to conflict of interests with other activities such as IT innovation, network, communication, etc.

Network Based Service Providers

109. The HKMA should, where applicable, encourage network and network-based critical service providers to accommodate international communication and message standards. The PFMI requires the FMI to use, or at a minimum accommodate, relevant internationally accepted communication procedures and message standards in order to facilitate efficient payment, settlement, and recording. At present, several network-based service providers offer digital platforms/networks (e.g., RippleNet), which are identical to conventional traditional payment messaging systems. DLT networks are also offered to be used as the technical platforms to execute payment transfer arrangements, based on non-negotiable rule books and conditions. Most of these entities operate without being regulated and subject to system risk specific requirements. Furthermore, these solutions are conceptualized in isolation within the payment and settlement ecosystem. In order to avoid market fragmentation and reduce the overall risks, the HKMA should monitor international developments and join international effort in encouraging network and DLT-based service providers to adopt international communication and message standards.

D. Virtual Assets

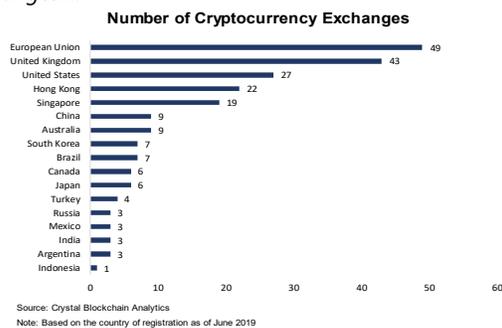
110. Hong Kong SAR sees a rise in virtual asset⁵⁹ (VA) activity. In a 2019 ranking of cryptocurrency exchanges, the HKSAR was listed as the fourth-largest with 22 exchanges, after the European Union, United States and United Kingdom, and just ahead of Singapore (with 19 exchanges). Based on December 2018 data, the monthly trading volume was much larger in HKSAR (US\$32.5 billion) than in the other jurisdictions, with the exception of Malta. Newer data for 2019 confirm the top position of the HKSAR's crypto trading platform volumes, especially for crypto to crypto exchanges. ICOs are no longer an active form of VA fundraising, but other forms have attracted interest. There has been a notable increase in high-profile initial exchange offerings (IEOs), which typically involve the exclusive launch on a VA trading platform of an initial offering and sale of a token utilizing blockchain. Reportedly, the total number of funds raised by IEOs in the second quarter of 2019 exceeds US\$1.4 billion.

Figure 2. Hong Kong SAR: Cryptocurrency Exchanges and Trading Volumes

⁵⁸ E.g. Hyperledger Fabric, R3 Corda and Ethereum.

⁵⁹ There is no legal definition of VAs in Hong Kong, but authorities typically follow the definition by the FATF when referring to these instruments. According to the FATF, a VA is a digital representation of value that can be digitally traded, or transferred, and can be used for payment or investment purposes. Please note that while the term most used is VA, to follow Hong Kong's terminology, the note may include references to crypto assets, which should be understood to have the same meaning.

HKSAR is among the largest hubs of cryptocurrency exchanges...



... with a large turnover, compared to peers



Sources: Crystal Blockchain Analytics, Marketwatch, Cryptocompare; IMF Staff Computations.

111. According to authorities, HKSAR financial institutions have very limited exposures to VAs.

- a. According to a survey conducted by the HKMA in 2018, the banking industry's financial exposures to VAs remains negligible. Banks have not engaged in any proprietary trading of crypto-related investment products or offered/recommended any crypto-related investment products to their clients. The HKMA understands that banks have no appetite for establishing business relationships with customers dealing in VAs. No investment bank has established VA trading desks in the HKSAR.
- b. The SFC has been collecting information on the securities industry's financial exposures to VAs through various means. As a part of the SFC's 2018 hedge fund manager survey, the SFC surveyed over 550 SFC-licensed hedge fund managers as of 30 September 2018 on the exposure to VAs and derivatives on VAs of funds managed by SFC-licensed hedge fund managers in the HKSAR. Only a few SFC-licensed hedge fund managers reported having exposures to VAs and derivatives on VAs, while none of the managers intended to invest more than 10% of the NAV in VAs. With respect to exposure to VAs by licensed corporations, the SFC noted from its biennial survey on the sale of non-exchange traded products sold by licensed corporations to individual clients in 2018 that only a few licensed corporations sold crypto-related products and the amount involved was immaterial. The SFC believes VA proprietary holdings by licensed corporations to be minimal, also, since such holdings cannot be counted towards its liquid assets when computing the capital maintained by the firm. The SFC has noted that it will continue to collect such information through a new annual survey to be jointly conducted with the HKMA from 2020 onwards. We believe a more systematic approach to the collection of information on VA holdings by all financial sector entities would be beneficial and we therefore welcome this joint initiative. To the extent insurance entities can hold VAs, we would recommend that data for the whole financial sector is gathered via this survey.

112. Financial sector regulators in the HKSAR have been focusing on VAs and VASPs for some time. Both the HKMA and the SFC, within their respective mandates, keep an active approach

to virtual assets, both monitoring HKSAR activities and developments, as well as issuing guidance where needed. The HKMA approaches VAs as the regulator in charge of monitoring financial stability, as well as from the perspective of supervising banks' exposure to these assets and their potential risks. From its mandate as securities and futures regulator, the exposure of the SFC to virtual asset activity is broader, and it has issued substantive guidance in relation to the offer, trading, custody of and investment in VAs.

113. Currently, the HKMA considers the size of VAs remains small and therefore does not pose a material threat to financial stability but remains vigilant. The HKMA requires banks which incur financial exposures to VAs to have in place adequate risk management controls for such activities. Banks planning to engage in activities relating to crypto assets should discuss with the HKMA whether they have put in place appropriate systems and controls to identify and manage associated risks. In 2019, the HKMA issued a circular to draw the attention of the banking industry to the Statement of the BCBS setting out its prudential expectations regarding banks' exposures to VAs and related services. The HKMA also issued an updated guidance to banks further to the amendment of Recommendation 15 by the FATF. Banks are expected to (i) conduct thorough customer due diligence against VASPs before establishing any customer relationship with them and (ii) undertake ML/TF risk assessments and take appropriate measures to manage and mitigate the identified risks before offering any new banking or investment products relating to VAs.

114. The HKSAR is planning to introduce a statutory regime for regulating VAs and VASPs, in addition to the existing legislation governing financial institutions, where applicable. If the structure, facts and circumstances of individual VAs fall under the definition of "securities", "futures contracts", or "collective investment schemes" of the SFO, these assets will be subject to HKSAR securities regulation and under the remit of the SFC. The SFC has, since 2017, issued multiple statements and circulars to clarify how the existing legal framework may apply to different kinds of VA activities. These have concentrated on the offer/issuance of VAs, the intermediation in VA investment products, trading services involving VAs and investment in VAs via collective investment schemes. The following sections describe the current approach taken by the SFC in relation to these topics.

Offer of VAs

115. Offers of VAs falling under the SFO's definition of securities or collective investment scheme are subject to the securities laws. In September 2017, at the height of the ICO market, the SFC issued its first statement clarifying that depending on the facts and circumstances of an ICO, digital tokens that are offered or sold may be "securities" as defined in the SFO. In such cases, activities related to those tokens may constitute a regulated activity and may require a license from the SFC. In particular, where the offer of a VA involves an offer to the HKSAR public to acquire securities or participate in a Collective Investment Scheme (CIS)⁶⁰, registration or authorization requirements under the law are applicable unless an exemption applies (e.g. offer to professional

⁶⁰ If token proceeds are managed collectively by the ICO scheme operator to invest in projects with an aim to enable token holders to participate in a share of the returns provided by the project, the digital tokens may be regarded as an interest in a CIS.

investors only). There are no other mandatory disclosure requirements applicable to an offer of non-security VAs in the HKSAR.

116. The SFC carried out a number of regulatory actions in relation to offers of VAs. During 2017 and 2018, there was significant ICO activity globally, including in the HKSAR. The SFC, further to its initial statement, reached out to a number of ICO issuers, warning them about the need to comply with SFC's regulatory regime should they offer VAs that qualify as securities. Most of them confirmed compliance with the SFC's regime or ceased to offer tokens to HKSAR investors. The SFC issued a further public warning of cryptocurrency risks detailing the above-mentioned regulatory actions in February 2018. In March 2018, it also halted one ICO to the HKSAR public, having considered the VAs as CIS units further to the SFO. ICO activity has virtually disappeared since its peak in 2018 and while the SFC continues to monitor potential offers of VAs, it currently does not consider it a significant source of risk to investors.

Intermediation of VA Investment Products

117. Financial intermediaries have to notify the SFC before they engage in any activity related to VAs. Intermediaries are advised to discuss these activities with the SFC before engaging in them. In addition, where crypto assets business is conducted in the HKSAR by other entities in the same group as an intermediary, the latter is encouraged to inform the SFC as soon as reasonably practicable so that the SFC may assess the potential impact of the group's crypto assets business on the intermediary. The SFC issued a circular in June 2018 to remind intermediaries of the notification requirements under the Securities and Futures (Licensing and Registration) Rules, which oblige intermediaries to promptly notify the SFC of any significant changes in the nature of their business.

118. Dealing in crypto asset related investment product may be a regulated activity requiring a license. Additionally, the SFC has also clarified via a Circular in December 2017 that some crypto-based futures have the conventional features of a futures contract and, accordingly, parties carrying on a business in dealing in such or marketing a fund investing in such are required to be licensed under the SFO. The same applies to other crypto asset related investment products including options, swaps, and contracts for differences. The SFC warned the investors again in 2019 that it had not licensed or authorized any person in Hong Kong to offer or trade VA futures contracts.

VA Trading Platform Activities

119. The SFC has recently set up a voluntary framework for the regulation of VA trading platforms. Starting from November 6, 2019, a firm which operates a centralized VA trading platform in the HKSAR and intends to offer trading of at least one security token on its platform may apply for a license from the SFC for Types 1 (dealing in securities) and 7 (providing automated trading services) regulated activities. Upon becoming licensed, the VA trading operator would be placed in the SFC Regulatory Sandbox, and should expect more frequent monitoring, reporting and reviews. Also, a set of regulatory standards or terms and conditions (described below) would specifically apply to these operators, imposed via licensing conditions. If a platform operator is licensed, its infrastructure, core fitness and properness and conduct of VA trading activities will be supervised as a whole. The SFC's regulatory remit over all those aspects of a platform's operations will be engaged both for the security and non-security token activity of the platform.

120. If the SFC decides to grant a license to a qualified platform operator, it will impose the following main licensing conditions: (i) The licensee must only provide services to professional investors; (ii) it must comply with the Terms and Conditions for VA Trading Platform Operators; (iii) it must obtain the SFC's prior written approval for any plan or proposal to introduce or offer a new or incidental service, activity or to make a material change to existing ones; (iv) it must obtain the SFC's prior written approval before adding any product; it must provide monthly reports to the SFC on its business activities and (v) it must engage an independent professional firm acceptable to the SFC to conduct an annual review of its activities and operations and prepare a report confirming that it has complied with the licensing conditions and all legal and regulatory requirements.

121. The Terms and Conditions applying to VA trading platform operators cover the following relevant areas:

- a. **Safe custody of assets:** Acknowledging that VA trading platforms do not only act as marketplaces matching buyers and sellers but also hold VAs on behalf of their clients, the SFC expects platforms to adopt an operational structure and use technology ensuring that it can offer client protection which is equivalent to traditional financial institutions in the securities sector. In particular, client assets must be held on trust for its clients through a wholly owned subsidiary of the platform operator, incorporated in the HKSAR and holding a "trust or company service provider" license under the AML/CFT Ordinance. Also, platform operators must ensure that it stores 98 per cent of clients' VAs in cold wallets and should minimize transactions out of the cold wallet in which a majority of client VAs are held. Platform operators and its associated entity must have procedures to deal with events such as hard forks or air drops, as well as adequate processes for handling requests for deposit and withdrawal of clients' VAs that guard against loss arising from theft, fraud and other dishonest acts, professional misconduct or omissions. An insurance policy must be in place at all times, covering the risks associated with the custody of VAs held in both hot and cold storage. Finally, strong internal controls must be implemented for private key management to ensure all cryptographic seeds and keys are securely generated, stored and backed up.
- b. **Investor protection:** A platform operator must specifically ensure that its client has sufficient knowledge of VAs and its relevant risks, before providing any services. A platform operator must also assess concentration risks by setting a trading limit, position limit or both with reference to the client's financial situation to ensure that the client has sufficient net worth to assume the risks and bear the potential trading losses.
- c. **AML/CFT:** The SFC expects a platform operator to establish and implement adequate and appropriate AML/CFT policies, procedures and controls and regularly review the effectiveness of these and introduce enhancements where appropriate taking into account any SFC guidance and the updates of the Financial Action Task Force. Platform operators should take reasonable steps to establish the true and full identity of its clients, their financial situation, investment experience and investment objectives. The SFC permits platform operators to deploy virtual asset tracking tools to trace the on-chain history of specific VAs, but reminds operators that they have primary responsibility for discharging AML/CFT obligations and must be aware that these tools have limited reach and their effectiveness can be compromised by anonymity-enhancing technologies or mechanisms.

- d. **Prevention of market manipulative and abusive activities.** The SFC expects platform operators to establish and implement written policies and controls for the proper surveillance or activities on its platform in order to identify, prevent and report any market manipulative or abusive trading activities. These should include, among other things, taking immediate steps to restrict or suspend trading upon the discovery of manipulative or abusive activities (e.g. temporarily freezing accounts). Also, platform operators should adopt an effective market surveillance system provided by a reputable and independent provider to identify, monitor, detect and prevent any market manipulative practices on its platform. It is important to note, however, that Parts XIII and XIV of the SFO, which enable the SFC to take action against market misconduct in the securities and futures markets, will not apply to any licensed VA trading platform because it is not a recognized stock or futures market and the VAs are not securities or futures contracts listed or traded on such a market.
- e. **Accounting and auditing.** The SFC requires VA platform operators to exercise due skill, care and diligence in the selection and appointment of auditors for its financial statements, and should have regard to their experience and track record in auditing VA related business and their capability to audit a platform operator.
- f. **Risk management.** A platform operator and its associated entities will need to have a sound risk management framework which enables them to identify, measure, monitor and manage the full range of risks arising from their business and operations. It should also require customers to pre-fund their accounts. In limited cases, the SFC may allow off-platform transactions to be conducted by institutional professional investors, which are settled intra-day. A platform operator is prohibited from providing any financial accommodation to clients to acquire VAs.
- g. **Conflicts of interest.** Licensed platform operators cannot engage in proprietary trading or market making activities on a proprietary basis. Should a platform plan to use market-making services to enhance liquidity in its market, the SFC would expect that this is done at arm's length and to be provided by an independent external party using normal user access channels.
- h. **VAs for trading.** Platform operators should set up a function responsible for establishing, implementing and enforcing: (i) the rules which set out the obligations of and restrictions on VA issuers; (ii) the criteria for a VA to be included on its platform and the application procedures; and (iii) the criteria for halting, suspending and withdrawing a VA from trading on its platform, the options available to clients holding that VA and any notification period.

122. While the regime for VA trading platforms provides a comprehensive framework to address the main risks from the activities of these entities, the voluntary nature of the approach faces some limitations. The approach taken by the SFC intends to enable close supervisory interactions with an evolving industry, while addressing AML/CFT and investor protection concerns arising from these platforms. Overall, the main limitation is the voluntary nature of the regime, as it does not adequately prevent criminal misuse of VAs and does not eliminate the potential for regulatory arbitrage and reputational risk to the regulator. The SFC recognizes that platforms may still decide to operate an entirely unregulated business (by avoiding to trade VAs that qualify as securities under the SFO), but expects this regime to provide the opportunity for investors to choose to participate in platforms which agree to be regulated and supervised under the SFC's

framework. In addition, certain key issues under the voluntary regime, like the inability of the SFC to take action against market misconduct in licensed platforms, could only be overcome by amending securities legislation. Building on the experience of supervising the voluntary regime, the SFC will continue to monitor VA activities and consider the need for legislative changes in the longer term, while using the IFEC to address investor education needs in relation to trading platforms.

123. The FSTB has recently launched a public consultation of a proposed statutory licensing regime for Virtual Asset trading platforms, which would likely enable a more holistic approach to VAs and related services.⁶¹

The legislative proposals set out features of a regulatory regime for VA trading platforms⁶² which are similar to those of the existing voluntary regime and allows VA platforms that have opted in to be regulated under the voluntary regime to continue their operations. It proposes to subject all VA platforms incorporated and with a permanent address in HKSAR to licensing requirements which include fit-and-proper tests based on criteria comparable to those applicable in other financial sectors. As is the case under the current voluntary regime, VA trading platforms would only be able to deal with “professional investors”, which include high net-worth individuals and institutional investors (licensed financial institutions). Unlicensed VA trading platforms, whether in Hong Kong or elsewhere, would be prohibited from actively marketing their services to the public of HKSAR. Licensed VA exchanges will then be subject to the full range of AML/CFT obligations including customer due diligence, record keeping and filing suspicious transaction reports, and would be subject to AML/CFT supervision by the SFC. The proposed sanctions applicable to breaches include criminal liabilities and administrative penalties. At this moment, the HKSAR authorities do not propose to regulate other standalone activities that fall under the FATF standard such as transfer and custodian services on the basis of such activities being “limited” in HKSAR but it is unclear whether they are proven to be of low ML/TF risks.

124. The HKSAR authorities are encouraged to closely monitor VA activities in the HKSAR to be able to properly identify and address any risks building up in the system, and to advance investor education efforts.

The recently published consultation paper of the proposed statutory licensing for Virtual Asset trading platforms is a step in the right direction and the authorities are encouraged to push the necessary legal reforms forward.⁶³ Once the legislation is enacted, the authorities should ensure its effective implementation. Moreover, the authorities should identify and assess the ML/TF risks stemming from the VA activities in particular those outside the proposed licensing regime (i.e., transfer, custodian and initial coin offering) and subject them to the AML/CFT regulatory framework in line with the FATF standards unless the ML/TF risks are proven to be low. The HKSAR authorities indicate in the proposal that they intend to build

⁶¹ https://www.fstb.gov.hk/fsb/en/ppr/consult/doc/consult_amlo_e.pdf

⁶² A VA exchange (trading platform) will be defined as any trading platform which is operated for the purpose of allowing an offer or invitation to be made to buy or sell any VA in exchange for any money or any VA (whether of the same or different type), and which comes into custody, control, power or possession of, or over, any money or any VA at any point in time during its course of business. Peer-to-peer trading platforms (i.e. platforms that only provide a forum where buyers and sellers of VAs can post their bids and offers, with or without automatic matching mechanisms, for the parties themselves to trade at an outside venue), to the extent that the actual transaction is conducted outside the platform and the platform is not involved in the underlying transaction by coming into possession of any money or any VA at any point in time, are not covered.

⁶³ The Consultation, published by the FSTB on November 3 2020, gives the SFC the authority to impose, and vary as need be, licensing conditions, on VASPs, as well as to publish regulatory requirements covering, inter alia, the main regulatory elements set out by the voluntary regime for VA trading platforms.

flexibility into the framework to facilitate future expansion of the scope of VA activities covered, which is welcomed. In the meantime, the SFC should also continue to regularly communicate with investors and address any investor education needs that may come up.

CIS Investment in VAs

125. The SFC has issued guidance for institutions that are managing funds investing in VAs.

The Proforma Terms and Conditions for Licensed Corporations which Manage Portfolios that invest in VAs (Terms and Conditions) apply to corporations that manage funds that invest at least 10 per cent of their assets in VAs or funds whose stated investment objective is to invest in VAs (VA Fund Manager). The Terms and Conditions cover key fund management regulatory requirements and provide specific guidance on VA related issues, where relevant. For instance, increased attention is paid to custody, and detail is provided on guidance for VA Fund Managers' selection of custodial arrangements and disclosure of those. Also, under the Terms and Conditions, VA Fund Managers should only allow professional investors to invest in a VA fund.⁶⁴ Where the fund is distributed through distributors, the VA Fund Manager should establish measures to ensure that it is only distributed to professional investors.

126. The SFC has also established guidelines for those individuals and corporations who distribute or market VA funds. Under this regulatory arrangement, if a VA fund available in HKSAR is not already managed by firms under the supervision of the SFC (per the Terms and Conditions described above), these funds will still be distributed by firms which are subject to the SFC's oversight. The Circular on Distribution of VA Funds issued by the SFC clarifies that intermediaries who distribute VA funds (whether or not authorized by the SFC) are required to be licensed or registered for Type 1 regulated activity (dealing in securities). The guidelines for VA fund distributors focus on investor protection by (i) requiring that VA funds are only targeted to professional investors and requiring distributors to assess whether clients have knowledge of investing in VA or related products and avoid clients' concentrated exposure to these assets; (ii) requiring distributors to conduct proper due diligence on VA funds not authorized by the SFC, their fund managers and other relevant entities; and (iii) requiring distributors to comply with certain disclosure requirements.

127. HKSAR financial regulators should continue to cooperate to monitor VA activities and identify potential risks to the financial system. VAs and related activities will continue to evolve and authorities should remain vigilant and strictly monitor developments to ensure an adequate regulatory perimeter. The developments regarding stable coins are also likely to significantly change the VA and VASP landscape and a joint approach will be required to fully understand the risks and implications for the financial system. While, to date, there have been more implications for the securities markets from VA activities and the SFC has been naturally leading the way in regulating these, the HKSAR will likely benefit from increasing its cross-sectoral engagement on this topic (in the lines of the current cooperation between the HKMA and the SFC), under the auspices of the FSTB or otherwise. A systematic cross-sectoral approach to VA activities will pave the way to a better understanding of these and those of stable coins and enable a faster reaction from authorities when needed.

⁶⁴ As defined under section 1 of Part 1 of Schedule 1 to the SFO.

Annex I. Fintech-Related Regulatory Initiatives in the HKSAR

Topic	Authority	Regulation/Guidance
Artificial Intelligence	HKMA	<p>High Level Principles on Artificial Intelligence https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191101e1.pdf</p> <p>Guiding Principles on Consumer Protection in respect of Use of Big Data Analytics and Artificial Intelligence by Authorized Institutions https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191105e1.pdf</p>
CrediTech	HKMA	<p>Guidelines on Credit Risk Management for Personal Lending Business https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20190829e1.pdf</p> <p>Circular on Credit Risk Management for Personal Lending Business https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180509e1.pdf</p> <p>Use of Personal Data in FinTech Development https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20190503e1.pdf</p> <p>Enhanced Disclosure Measures in respect of Digital Platforms for the Application of Unsecured Loan and Credit Card Products https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200904e1.pdf</p>
Open API	HKMA	<p>Consumer Protection Measures of Authorized Institutions in respect of Open API Framework https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20191029e1.pdf</p>

Virtual Banking	HKMA	Revised Guideline on Authorization of Virtual Banks https://www.hkma.gov.hk/eng/news-and-media/press-releases/2018/05/20180530-3/
Digital Banking	HKMA	Risk Management of E-banking https://www.hkma.gov.hk/media/eng/doc/key-functions/banking-stability/supervisory-policy-manual/TM-E-1.pdf
Remote onboarding	HKMA	Remote on-boarding of individual customers https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20190201e1.pdf Feedback from recent thematic reviews of Anti-Money Laundering and Counter-Financing of Terrorism (AML/CFT) control measures for remote customer on-boarding initiative https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200603e1.pdf Key observations and good practices in AML/CFT control measures for remote customer on-boarding initiatives https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200603e1a1.pdf Circular on Clarification on Remote Investment Account Opening https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180824e2.pdf
Online financial product distribution	HKMA	Circular on Online Distribution and Advisory Platforms for Non-SFO-Regulated Structured Investment Products https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180824e1.pdf Circular on Expansion of Types of Life Insurance Products Eligible for Exemption from Financial Needs Analysis https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180525e2.pdf
Distribution of long term insurance policies via video conferencing tools	IA HKMA	Circular on “Circular issued by the Insurance Authority on Sandbox application for the distribution of long term insurance policies via video conferencing tools” https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2020/20200805e2.pdf https://www.ia.org.hk/en/legislative_framework/circulars/reg_matters/files/Circular_05082020.pdf

AML	HKMA	Amendments to Guideline on Anti-Money Laundering and Counter-Terrorist Financing (For Authorized Institutions) https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180223e1.pdf Anti-Money Laundering and Counter-Terrorist Financing (Financial Institutions) (Amendment) Ordinance 2018 https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2018/20180202e2.pdf
Data privacy	HKMA PCPD	Use of Personal Data in Fintech Development https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2019/20190503e1.pdf
Cyber-risk	HKMA	Cybersecurity Fortification Initiative 2.0 https://www.hkma.gov.hk/eng/news-and-media/press-releases/2020/11/20201103-4/
	SFC	Paragraph 18 and Schedule 7 of the Code of Conduct for all licensed corporations Guidelines for Reducing and Mitigating Hacking Risks Associated with Internet Trading https://www.sfc.hk/web/EN/assets/components/codes/files-current/web/guidelines/guidelines-for-reducing-and-mitigating-hacking-risks-associated-with-internet-trading/guidelines-for-reducing-and-mitigating-hacking-risks-associated-with-internet-trading.pdf Report on the 2019-20 thematic cybersecurity review of internet brokers https://apps.sfc.hk/edistributionWeb/api/circular/openAppendix?lang=EN&refNo=20EC58&appendix=0
Data Standards	SFC	Data Standards for Order Life Cycles https://www.sfc.hk/edistributionWeb/gateway/TC/circular/intermediaries/supervision/openAppendix?refNo=19EC50&appendix=0
Payment systems	HKMA	Oversight framework for Faster Payment System

Virtual Assets	SFC	<p>Circular on Terms and Conditions for licensed corporations which manage portfolios that invest in virtual assets https://www.sfc.hk/edistributionWeb/gateway/EN/circular/intermediaries/supervision/doc?refNo=19EC62</p> <p>Circular to intermediaries on the distribution of virtual asset funds https://www.sfc.hk/edistributionWeb/gateway/EN/circular/doc?refNo=18EC77</p> <p>Position paper on regulation of virtual asset trading platforms https://www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=19PR105</p> <p>Statement on Initial Coin Offerings https://www.sfc.hk/web/EN/news-and-announcements/policy-statements-and-announcements/statement-on-initial-coin-offerings.html</p> <p>Circular to licensed corporations and registered institutions on bitcoin futures contracts and crypto-currency related investment products https://www.sfc.hk/edistributionWeb/gateway/EN/circular/doc?refNo=17EC79</p> <p>Statement on security token offerings https://www.sfc.hk/web/EN/news-and-announcements/policy-statements-and-announcements/statement-on-security-token-offerings.html</p>
Robo-advice	SFC	<p>Guidelines on Online Distribution and Advisory Platforms https://www.sfc.hk/web/EN/assets/components/codes/files-current/web/guidelines/guidelines-on-online-distribution-and-advisory-platforms/guidelines-on-online-distribution-and-advisory-platforms.pdf</p>