HONG KONG MONETARY AUTHORITY
香港金融管理局

Tech Baseline Assessment
Key Observations and Way Forward

June 2022

Executive Summary

- **As part of its Fintech 2025 Strategy, the HKMA completed a Tech Baseline Assessment in June 2022**. The exercise aims to take stock of banks' current and planned adoption of Fintech in the coming three years, so as to identify Fintech business areas or specific technology types which may be underdeveloped, and would benefit from the HKMA's support.

- **Overall, the results of the assessment indicate that banks in Hong Kong are committed to greater Fintech adoption and prepared to dedicate healthy amounts of financial and talent investment to the cause.** This positive sentiment extends across the industry, and most of the banks participating in the exercise expect to make good progress in achieving their objectives for Fintech adoption by 2025.

- **The participating banks have not identified any clear-cut barriers to Fintech adoption.** There is a general consensus that lack of support or inertia from management and/or employees are not impeding Fintech adoption in Hong Kong, and no other issues have been singled out as requiring attention.

- **Building on this supportive foundation**, **banks' adoption of the surveyed Fintech business areas is expected to increase across the board, albeit variations exist among individual business areas.** By 2025, Regtech, Paytech and Lendingtech are expected to be the most mature and widely-adopted Fintech business areas, while Investech and Wealthtech will enjoy mid-range levels of adoption. Buoyed by substantial industry interest, adoption of Greentech is set to double over the period, while Legaltech will also see significant growth albeit from a low base. Meanwhile, there exists considerable scope to further grow Insurtech adoption by banks.

- **As banks move forward in their Fintech journeys, they expect to utilise both established and more novel technology types.** However, there may be scope to deepen the sophistication of Artificial Intelligence (AI) technologies applied by banks, and there may also be merits for the industry to closely monitor future developments of Distributed Ledger Technologies (DLT) to reap their full potential.

- **Taking into account the results of the assessment, the HKMA has decided to promote developments in the Fintech business areas of Investech, Wealthtech, Insurtech and Greentech and the technology types of AI and DLT in the years ahead**. These areas show good potential for further growth, and will likely be supported by market trends and developments in technology.

- **To take this forward, the HKMA will formulate over the next few months a detailed roadmap of initiatives that complement its existing work related to Fintech development.** Potential initiatives under consideration include those that can help raise awareness, strengthen industry discourse, deepen technical understanding of the targeted Fintech business areas and technology types, and further boost the availability of Fintech solutions in Hong Kong. These are intended to complement the HKMA's current work under the Fintech 2025 Strategy. Collaboration will form a key part of this work, and the HKMA will closely engage with other local authorities, the financial services industry and the technology community in the process.

A. Introduction

The Hong Kong Monetary Authority (HKMA) unveiled a Fintech 2025 Strategy[1] to drive the Fintech development in Hong Kong in June 2021. One key initiative is "All banks go Fintech", which seeks to promote the all-round adoption of Fintech by Hong Kong banks and encourage them to fully digitalise their operations, from front-end to back-end.

As part of this initiative, the HKMA announced that it would conduct a Tech Baseline Assessment to take stock of banks' current and planned adoption of Fintech in the coming three years, so as to identify Fintech business areas or specific technology types which may be underdeveloped, and would benefit from the HKMA's support.

To take this forward, the HKMA invited all licensed banks with significant operations in Hong Kong to develop a Three Year Plan for Fintech adoption and complete a questionnaire by end-2021. In total, 54 submissions reflecting the plans of 63 Authorized Institutions (AIs)[2] were received.

This report summarises the HKMA's key observations from the exercise and details how the HKMA plans to further support the industry's adoption of Fintech going forward.

[1] Please refer to the following HKMA press release for more details.

[2] Some AIs from the same group opted to make a consolidated submission. The numerical analyses contained in this report are computed based on the number of submissions unless otherwise specified.

B. Key Observations

Key Observation 1: Banks in Hong Kong are committed to and prepared to invest in greater Fintech adoption. Most of them anticipate good levels of success by 2025.

Chart 1: Expected growth in Fintech investment, by banks' asset size (2022-2025 vs. 2018-2021)

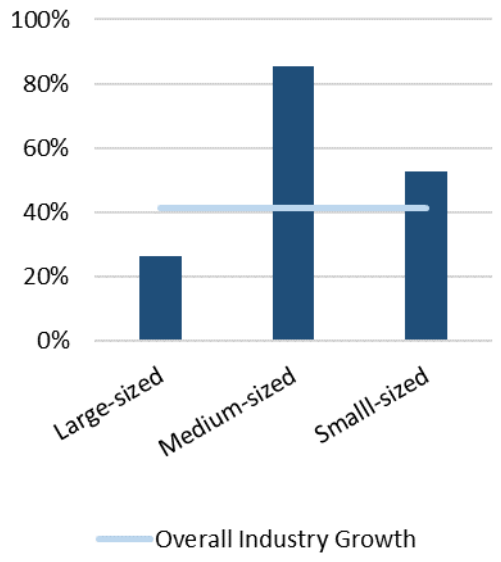
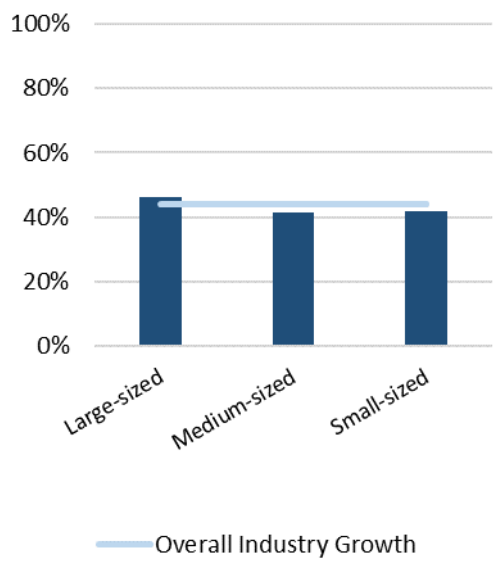


Chart 2: Expected growth in Fintech talent, by banks' asset size (2025 vs. 2021)



Notes:

- For the purpose of this report, the following definitions are adopted:
  - "Large-sized" refers to banks with an asset size greater than HK$500 billion;
  - "Medium-sized" refers to banks with an asset size between HK$100 billion and HK$500 billion;
  - "Small-sized" refers to banks with an asset size below HK$100 billion.

- **Banks in Hong Kong are committed to greater Fintech adoption, and prepared to dedicate healthy amounts of financial and talent investment to the cause.** Total financial investment in Fintech by banks between 2022 and 2025 is expected to increase by around 40% compared to that invested between 2018 and 2021 (Chart 1). In terms of talent, banks plan to increase the total number of Fintech-related and Fintech-skilled staff[3] by around a similar proportion between 2021 and 2025 (Chart 2).

[3] "Fintech-related" staff refers to employees who are required to have a fair understanding of Fintech to discharge their responsibilities. "Fintech-skilled" staff represent a sub-set of this and covers those

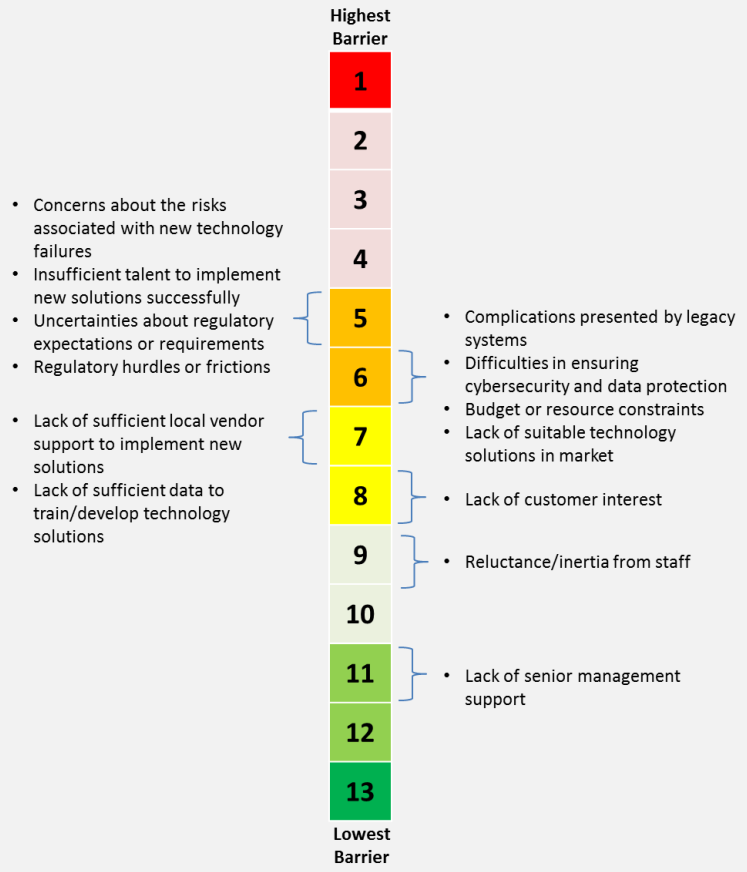
- **This positive sentiment extends across the industry.** Banks of all asset sizes expect to deploy more financial and talent resources to Fintech. While larger banks have traditionally taken the lead in adopting Fintech, and expect to maintain their commitment to Fintech going forwards, there are signs that small and medium-sized banks are also paying increased attention to the importance of Fintech. For instance, the expected financial investment by small and medium-sized banks is set to grow by over 50% and 80% respectively in the next three-year period (Chart 1). The HKMA is also pleased to note that foreign bank branches are similarly supportive of the initiative, with most having developed Fintech plans for their Hong Kong operations, leveraging on their global and regional capabilities. As global banks increasingly embrace Fintech in the years ahead, there will be potential for their branches in Hong Kong to broaden the technology solutions and applications offered to their clients in this region. This would be in the interest of promoting Hong Kong's position as a Fintech hub.

- **Banks are generally optimistic that their investments will bear fruit.** More than 90% of banks expect to make good progress in achieving their identified objectives for greater Fintech adoption. These include, but are not limited to, improving customer experience, increasing operational efficiency, improving accuracy and enhancing their risk management and monitoring capabilities.

staff with expertise in Fintech areas, including artificial intelligence, blockchain, cloud computing, open API, cybersecurity, and big data.

<u>Key Observation 2</u>: Banks have not identified any clear-cut barriers to greater Fintech adoption.

<u>Chart 3</u>: Average ranking of common barriers to Fintech adoption

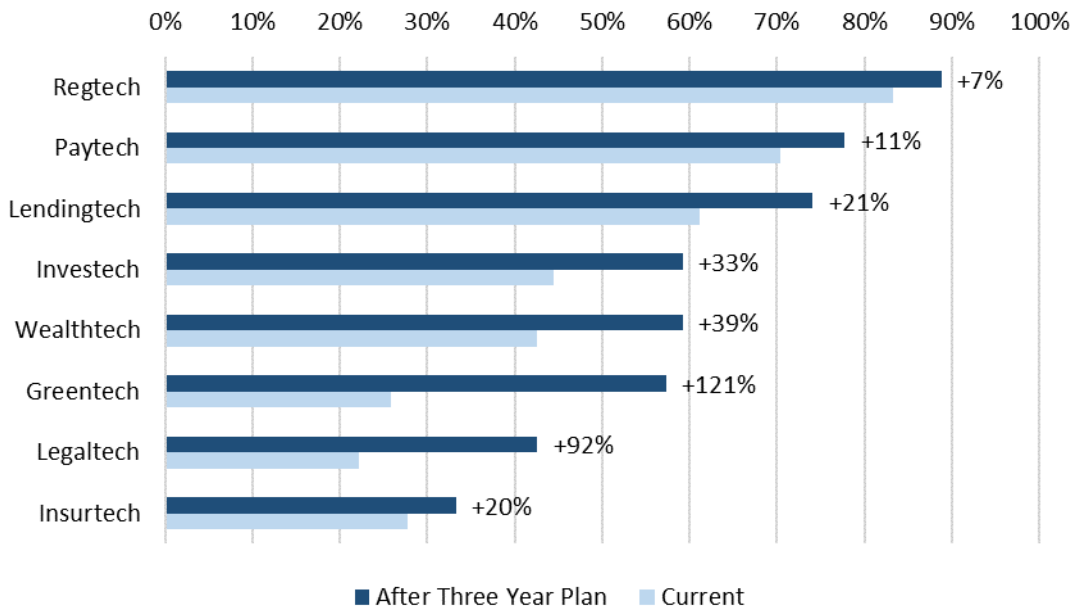


- **There is a general consensus that the lack of senior management or employee support is <u>not</u> a barrier to greater Fintech adoption.** Given Fintech adoption is as much about technology and infrastructure as it is about developing a culture and workforce that embraces and is prepared to invest in digitalisation, this supportive attitude from management and staff bodes well for Fintech development.

- **No issues have been singled out as the most pressing or requiring attention.** That said, there are a few issues that are more commonly cited by banks as warranting attention, including regulatory uncertainties, risks associated with technology use and talent and solution availability. These provide helpful indications of the direction of HKMA support that may benefit the industry.

<u>Key Observation 3</u>: Building on this supportive foundation, adoption of Fintech in the eight surveyed business areas is set to increase across-the-board, although variations in the rate of adoption exist.

<u>Chart 4</u>: Current and anticipated adoption rate of the surveyed Fintech business areas



<u>Notes:</u>

For the purpose of this report, the following definitions (which relate to banks' adoption of Fintech) are adopted:

- Investech are technologies which facilitate the delivery of investment services and products.
- Regtech are technologies which facilitate the delivery of regulatory requirements or risk management outcomes.
- Wealthtech are technologies which facilitate the delivery of wealth management services.
- Paytech are technologies which facilitate the conduct of payment and fund transfer transactions.
- Lendingtech are technologies which facilitate the origination, processing and granting of loans.
- Greentech are technologies which facilitate the conduct of green investments/business (i.e. those which help reduce negative effects on the environment).
- Insurtech are technologies which facilitate the delivery of insurance products/services.
- Legaltech are technologies which facilitate the provision of legal advice or finalisation of legal arrangements.

- **Regtech, Paytech and Lendingtech are currently and set to remain the top three most commonly adopted Fintech business areas by 2025.** This development follows various supportive measures rolled out by the HKMA, such as a two-year roadmap for developing a more vibrant and diverse

Regtech ecosystem in Hong Kong[4] and the launch of the Faster Payment System.

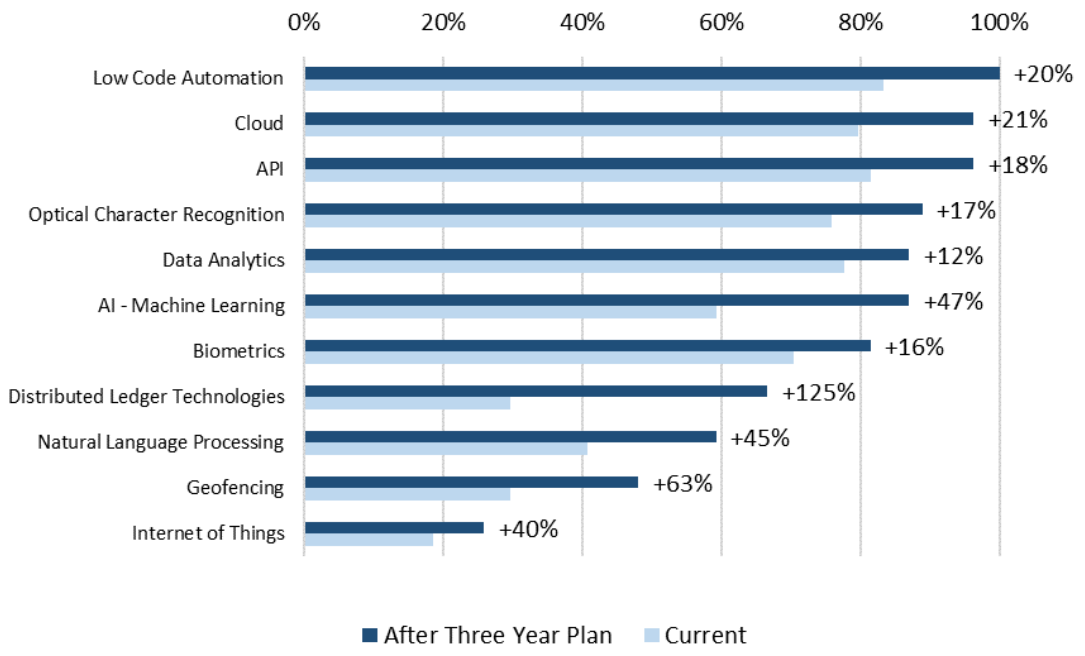
- **Investech and Wealthtech will continue to enjoy mid-range levels of adoption, while Insurtech adoption by banks will also grow, but more modestly, by 2025.** These three areas show potential for further development following the advancements made in the payment, lending and risk management space. They should also be supported by the increased demand for investment and wealth management services presented by the Greater Bay Area (GBA).

- **Greentech adoption is set to increase rapidly and projected to double to around 60% of banks by 2025**. This mirrors and will likely support the industry's rapidly developing interest in green banking business, especially those aspects that concern the processing and review of large volumes of data (e.g. management of disclosures). Similar momentum can also be seen for Legaltech, with its adoption rate expected to almost double to around 40% by 2025.

[4] Please refer to the following HKMA press release for more details.

<u>Key Observation 4</u>: Banks expect to widely adopt both established and more novel technology types by 2025. However, there is scope to deepen the sophistication of the Artificial Intelligence (AI) technologies and Distributed Ledger Technologies (DLT) applied by banks.

<u>Chart 5</u>: Current and anticipated adoption rate of the surveyed technology types



- **Banks in Hong Kong will adopt both established and more novel technology types as they work to implement their Fintech strategies.** Except Geofencing and Internet of Things, adoption of all of the surveyed technologies are expected to almost reach or exceed 60% by 2025 (<u>Chart 5</u>).

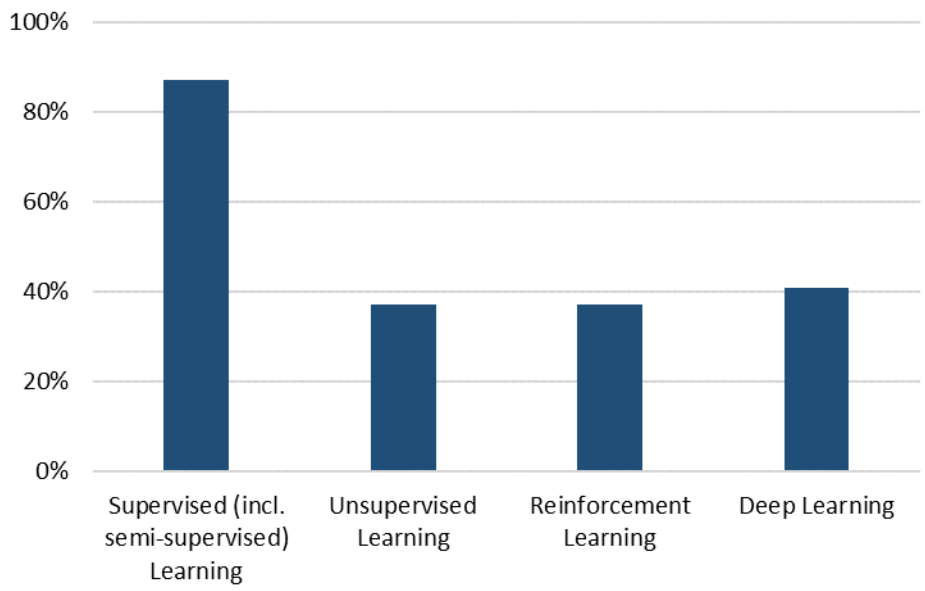
- **That said, there are indications that banks could further deepen their application of AI technologies.** While many banks will adopt some form of Machine Learning technology, there is a clear preference for supervised learning models over more complex techniques, such as unsupervised and deep learning models (<u>Chart 6</u>). Benchmarking based on publicly available industry surveys indicates that financial institutions[5] abroad are shifting

[5] Please see:

- *"The defining moment for data scientists: Artificial intelligence and machine learning ready to change finance"*, LSEG Labs.

more rapidly into this space, suggesting that there may be benefits for banks in Hong Kong to explore the potential of doing the same.

Chart 6: Anticipated adoption rate of Machine Learning techniques



- **The same also applies to DLT.** Adoption of DLT is projected to more than double by 2025, with banks set to explore a range of use cases, including those around central bank digital currencies (CBDCs), settlement, credit assessment and trade financing. While this is a positive start, given DLT is still at a nascent stage of development, there appear merits to closely observe whether and how the application of DLT may continue to evolve within not just the realm of traditional financial services, but possibly beyond (e.g. Decentralised Finance, or DeFi).

➢ *"Machine learning in UK financial services",* Bank of England and Financial Conduct Authority.

C. Way Forward

The HKMA is encouraged by the industry's strong support for Fintech adoption. It is evident that the HKMA's work since 2017 to progressively promote and support digitalisation has been well received by banks and continues to bear fruit. That said, the HKMA considers that it can and should do more to support the industry as it moves forward in its Fintech journey.

Based on the results of the Tech Baseline Assessment ("the Results"), the HKMA sees merits to promote developments in the **Fintech business areas of Investech, Wealthtech, Insurtech and Greentech and the technology types of AI and DLT** in the coming years.

To take this forward, the HKMA will develop a detailed roadmap of initiatives ("Roadmap") that complement its existing work related to Fintech development. These will mainly aim to raise awareness, strengthen industry discourse, deepen technical understanding of the targeted Fintech business areas and technology types, and further boost the availability of Fintech solutions.

Further details about the HKMA's planned next steps and key considerations are provided below.

(i) Investech, Wealthtech and Insurtech

The HKMA sees great potential to further grow Hong Kong banks' adoption of Investech, Wealthtech and Insurtech from the relatively moderate levels noted in the Results. The continued development of the GBA is expected to substantially increase the demand for cross-boundary investment services, especially as facilitating measures like the Cross-boundary Wealth Management Connect Scheme[6] are rolled out. As Hong Kong banks ride on this momentum to further expand and diversify their wealth management and investment offerings, it will be natural for them to explore how technology can feature within or help streamline associated processes.

[6] Please refer to the following HKMA resource for more details.

The HKMA has all along worked to facilitate banks' engagement in these business areas, including through the provision of guidance and advice on best practices. For instance, the HKMA issued a circular [7] in September 2021 providing guidance on how AIs may distribute investment and insurance products through non-face-to-face channels in a customer-friendly manner whilst according protection to customers.

That said, the HKMA recognises that besides operational guidance, promotion would also be crucial for attracting institutions to engage in these Fintech business areas. From its experience with promoting Regtech adoption - which the Results encouragingly show has reached a relatively mature stage of development – the HKMA has seen the catalytic effect of laying a solid foundation of awareness and understanding on kick-starting and sustaining the industry's interest in a new Fintech business area.

To this end, the HKMA will consider including a variety of promotional activities within its Roadmap. Potential ideas include webinars which provide an opportunity for stakeholders, including more experienced financial institutions and regulators to conduct high-level sharing with banks interested in adopting Investech, Wealthtech and Insurtech. If the feedback received from the industry suggests that more technical knowledge sharing would be helpful, consideration could also be given to arranging deep-dive training sessions. Finally, showcase and match-making sessions could also be arranged to connect banks with Fintech firms that specialise in providing solutions related to the Fintech business areas. The objective would be to raise banks' awareness of the solutions that are available in the market, whilst simultaneously communicating to Fintech companies that there is business demand in Hong Kong, and that there may be merits for them to establish a stronger presence here or develop more Hong Kong-specific solutions.

(ii) Greentech

The Results indicate that Greentech adoption is anticipated to double between now and 2025. This reflects the industry's immense interest in green and sustainable finance, which has been a key developmental priority of the HKMA and other financial regulators in Hong Kong. In 2020, the HKMA and the Securities and Futures Commission (SFC) initiated the formation of the Green

[7] Please refer to the following HKMA circular for more details.

and Sustainable Finance Cross-Agency Steering Group (Steering Group). The Steering Group aims to co-ordinate the management of climate and environmental risks to the financial sector, accelerate the growth of green and sustainable finance in Hong Kong and support the Government's climate strategies. Since then, the Steering Group announced its green and sustainable finance strategy for Hong Kong[8]. Encouraging innovation, including exploring the use of technologies, to facilitate capital flows towards green and sustainable causes is one of the areas included in the strategy.

In addition, the HKMA has undertaken a variety of work to facilitate banks' adoption of Greentech. Specifically:

- The HKMA concluded "Project Genesis" in 2021 with the Bank for International Settlements Innovation Hub (BISIH) Hong Kong Centre. The project concept-tested the issuance of tokenised green bonds to retail investors in Hong Kong, and developed prototypes which demonstrate how technologies, such as DLT, can help streamline the green bond issuance process and allow investors to more easily track the environmental impact of the financed projects.

- The HKMA has been leading a workstream under the Bank for International Settlements Innovation Network's "Digital Twin Project" to explore how technological solutions can be deployed to assist with physical risk assessments, as well as employ AI technology to incorporate real-time data into the risk assessment.

Going forward, the HKMA will continue to build on these initiatives to lend further support to the Greentech ecosystem. For instance, the HKMA will explore the feasibility of piloting the issuance of tokenised green bonds under the Government Green Bond Programme, and introducing other Greentech initiatives that help the banking sector identify, measure and monitor their exposures to climate risks.

(iii) AI and DLT

The Results indicate that the adoption of AI and DLT technologies by banks will be quite wide-spread by 2025. This is a welcome development that follows

[8] Please refer to the following HKMA press release for more details.

substantial efforts by the HKMA to promote banks' confidence and familiarity in adopting these technologies, including:

- To support banks' adoption of AI technologies, the HKMA issued a set of "High-level Principles on AI"[9] in 2019 to provide guidance on good practices associated with AI adoption. The guidance was developed following a principles-based approach to avoid inadvertently restricting market developments.

- The HKMA is undertaking work to showcase the potential business relevancy of DLT for banks. Under its Multiple CBDC Bridge (mBridge) project[10], the HKMA has already demonstrated how DLT technologies, as applied to the mBridge trial platform, can help address some of the key pain-points associated with cross-border payments. A total of 15 business use cases have been identified for potential exploration[11] in collaboration with other participating authorities, the BISIH and private sector participants.

- The HKMA is developing a number of DLT-based platforms for industry use, which will provide banks with an opportunity to experience the application and features of DLT first-hand. These include the Commercial Data Interchange (CDI)[12] and the new Credit Reference Platform. The latter is expected to offer benefits including: (i) enhanced resilience of consumer credit reference service to credit providers and reduced operational risk of having only one service provider in the market, particularly the risk of a single point of failure; (ii) enhanced protection of consumer credit data involved in the provision of consumer credit reference service; and (iii) strengthened consumer protection in respect of consumer credit reference service.

Given the positive levels of adoption expected, the issue at hand is how to deepen the sophistication of AI technologies applied by banks, and ensure that

[9] Please refer to the following HKMA circular for more details.
[10] The mBridge project explores the capabilities of DLT and how it can facilitate real-time cross-border foreign exchange payment-versus-payment transactions in a multi-jurisdictional context and on a 24/7 basis.
[11] Please refer to the following brochure for more details.
[12] The CDI is a next-generation and DLT-based financial data infrastructure that aims to enable more efficient financial intermediation in the banking system. For more details, please refer to the following HKMA resource.

emerging opportunities under DLT are captured as the technology continues to evolve.

For this purpose, the HKMA considers that a number of initiatives can be explored for inclusion in the Roadmap. Specifically, consideration will be given to hosting a competition focused on AI and DLT technologies. The current thinking would involve inviting Fintech companies specialising in the technologies (including advanced techniques) to design and submit solutions that would help address common pain-points experienced by banks in Hong Kong. The solutions would then be judged based on their relevancy and suitability for the Hong Kong market. Furthermore, to enable the industry to remain well informed of latest developments in the realms of AI and DLT, the HKMA will also consider commissioning research projects on emerging technology areas where appropriate.

(iv) Talent development

Talent is a common denominator for success across all of the identified Fintech business areas and technology types. The HKMA is committed to enabling the long-term sufficiency of Fintech talent in Hong Kong. To this end, the HKMA follows a two-pronged approach focused on: (i) enhancing the Fintech competency of existing banking practitioners, and (ii) attracting new talent to the industry and providing suitable training to them.

With respect to the first "prong", the HKMA launched an Enhanced Competency Framework[13] (ECF) on Fintech in December 2021. It sets out the competency standards required of Fintech practitioners in the banking sector and a qualification framework for recognising those practitioners who have completed the necessary training and assessment, and obtained relevant work experience. The training courses and assessment under the ECF on Fintech will be offered by the Hong Kong Institute of Bankers in collaboration with relevant universities in 2022.

As regards the latter, the HKMA has pioneered a number of programmes including the Banking Graduate Trainee Programme, Future Banking Bridging Programme, Industry Project Masters Network (IPMN) scheme, and Fintech

[13] Please refer to the following HKMA circular for more details.

Career Accelerator Scheme (FCAS)[14]. Collectively, these initiatives provide undergraduate and postgraduate students, as well as fresh graduates, with training, mentorship, project and work experience in Fintech, in a bid to capture their interest early and groom them for entry into the industry.

Going forward, the HKMA will continue to stay alert to the talent development needs of the industry and consider rolling-out further supportive measures as appropriate.

(v) Cross-sector collaboration

The HKMA recognises that Fintech adoption is not unique to banks. There is significant potential to reap synergies and amplify the benefits of Fintech adoption if the wider financial sector can also be encouraged to explore the opportunities in Fintech. This is especially true with respect to Investech, Wealthtech and Insurtech.

When formulating its detailed roadmap, the HKMA will closely engage with other local authorities, including the SFC, the Insurance Authority (IA) and the Mandatory Provident Fund Schemes Authority (MPFA), to explore the potential for cross-agency collaboration. Where appropriate, the scope of the Roadmap and/or individual initiatives will be expanded to accommodate wider industry participation beyond the banking sector.

[14] For more details, please refer to the following HKMA resource.