



The Regtech Adoption Index 2020



HONG KONG MONETARY AUTHORITY
香港金融管理局



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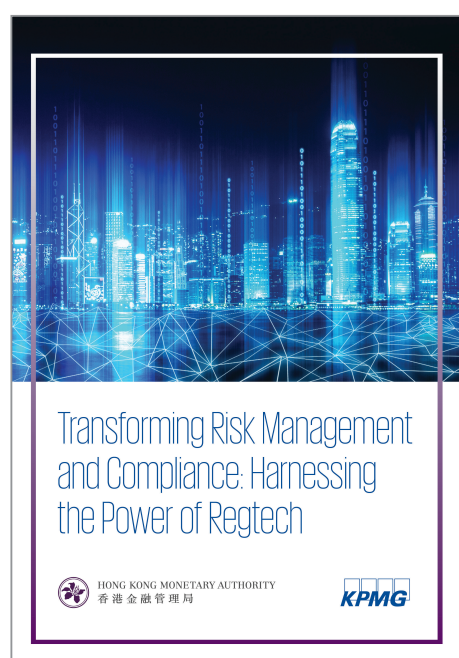
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Introduction

1.1 Preface

In its recent white paper titled *'Transforming Risk Management and Compliance: Harnessing the Power of Regtech'*¹, the Hong Kong Monetary Authority (HKMA) highlighted the importance and benefits that Regtech brings to banks in Hong Kong, their customers, and the regulators.

Figure 1.1: The HKMA's 'Transforming Risk Management and Compliance: Harnessing the Power of Regtech', 2020



Source: HKMA

¹ Transforming Risk Management and Compliance: Harnessing the Power of Regtech, HKMA (2020), <https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2020/20201102e3a1.pdf>

The rapidly evolving external environment and increasingly complex banking business models are driving banks to adapt and embrace innovation and transform to remain competitive. Regtech is an important area in this regard; harnessing the power of technology to create a positive transformation of risk management and regulatory compliance processes.

The banking industry, the HKMA, the technology community, and other stakeholders have done much to promote Regtech in Hong Kong to date. The white paper includes several recommendations to further increase Regtech adoption, including the development of a framework that measures banks' level of Regtech adoption (Figure 1.2).

To address this recommendation, the HKMA commissioned KPMG to create the Regtech Adoption Index (RAI) to measure Regtech adoption among banks in Hong Kong.

This inaugural version of the RAI describes what the index is and how it measures adoption and evaluates the current level of adoption among Hong Kong's banks. Through a detailed analysis, it uncovers insights into where banks are currently using Regtech, how they are preparing for

Regtech adoption, and their views on the drivers and barriers to further adoption.

We hope that this report serves as a useful indicator of the current market landscape, how it is likely to develop in the coming year, and how banks, the HKMA, and Regtech providers can help to accelerate Regtech adoption in Hong Kong's banking sector.

1.2 Purpose of the Regtech Adoption Index

It is essential to have a clear and measurable way to demonstrate and monitor the progress of Regtech adoption so that initiatives can be enhanced and updated. This can be challenging given the difficulties in gathering data and discerning the clear benefits of Regtech adoption. The purpose of the RAI is to create an objective measure that describes the current level of Regtech adoption among banks in Hong Kong as well as banks' preparedness and intent to adopt. It is a holistic framework that can be used to draw inferences about what the Regtech ecosystem can do to improve further.

Figure 1.2: The original recommendation from the white paper 'Transforming Risk Management and Compliance: Harnessing the Power of Regtech', 2020 to develop a Regtech Adoption Index (RAI)

Recommendation 15

Provide a clear way to measure and guide success in Regtech adoption by developing and publishing a Regtech Adoption Index

Develop a Regtech Adoption Index (RAI) that covers actual adoption, intent to adopt, as well as key enablers for adoption. Covering these elements will provide a more holistic and balanced framework to evaluate Regtech adoption among banks in Hong Kong. The introduction of an RAI is likely to convey the regulator's clear commitment to Regtech and their desire to understand the factors that are helping to promote or inhibit adoption. An RAI should measure banks' Regtech adoption propensity and preparedness across four pillars:

- **Investment:** Financial and resource commitments that have been, or are planned to be allocated towards Regtech.
- **Adoption:** Breadth and extent of Regtech application within the bank, their readiness to adopt and the suitability of available Regtech solutions.
- **Talent and culture:** Availability and development of Regtech-related skills, openness to innovation and leadership support.
- **Impact:** Actual or perceived value generated from implementing Regtech.

1.3 A brief background of Regtech

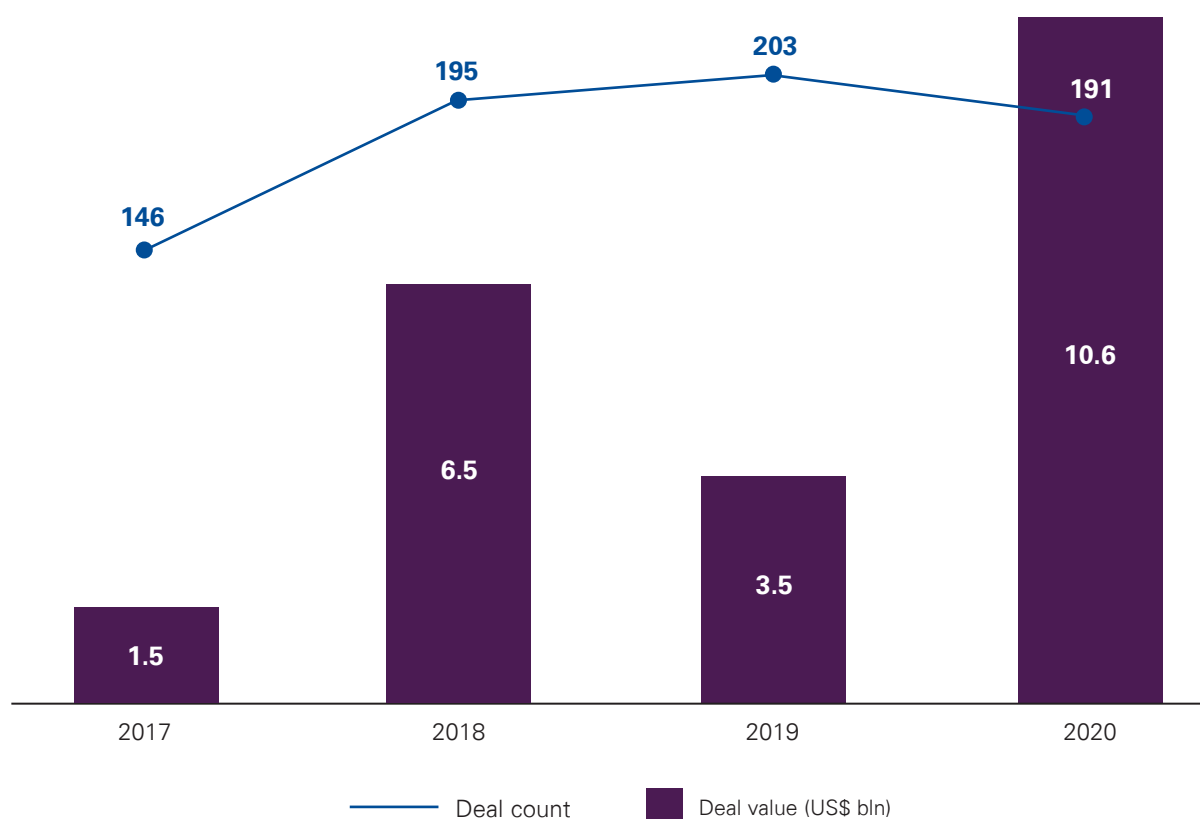
Financial institutions have been using technology to improve the effectiveness and efficiency of their risk management and regulatory compliance activities long before the term 'Regtech' was coined. In this report, Regtech is defined as the use of technologies that enhance efficiency and/ or the effectiveness of risk management and regulatory compliance. Regtech, in its current form, emerged in the late 2000s as financial institutions and solution providers began to harness a new generation of technologies such as cloud, Artificial Intelligence (AI), and Application Programming Interface (API) to transform risk management and compliance processes.

The creation of the term 'Regtech' as a sub-set of fintech has since gone on to help raise awareness and stimulate interest among financial institutions and service providers alike. Today, many regulators have some form of guidance or initiatives that are designed to promote the use of Regtech, and there is significant interest from investors with total global investment activity for Regtech hitting USD 10.6 billion in 2020. (Figure 1.3).

Regtech is expected to continue to grow as we enter the 2020s amid emerging new risks from increasingly digital business models for banking and a challenging external environment. There is also an increasing expectation from both the regulators and the public for banks to robustly manage risks and to act in the best interests of consumers and the market. As banking becomes more complex, there is a growing need to meet these expectations in a cost-effective manner through Regtech solutions.



Figure 1.3: Total global investment activity (Venture Capital, Private Equity, and Merger and Acquisition) for Regtech*



*Global analysis of investment in fintech, KPMG International (data provided by PitchBook), as of 31 December 2020. Due to ongoing updates to PitchBook's data as additional information comes to light, data extracted before or after this date may vary. The slight drop in deal count from 203 in 2019 to 191 in 2020 may be due to fewer but larger deals because of the increased maturity of Regtech providers. It is also possible that more deals will be captured in the dataset retrospectively as new information comes to light.

Source: Pulse of Fintech H2 2020, KPMG (February 2021), <https://assets.kpmg/content/dam/kpmg/xx/pdf/2021/02/pulse-of-fintech-h2-2020.pdf>



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Executive summary

This report marks the first time that Regtech adoption has been comprehensively measured in Hong Kong by means of the newly developed RAI. The inaugural RAI score paints a picture of high expectations of Regtech among Hong Kong's banks, while also suggesting that there is significant room for growth as most banks expect positive contributions from Regtech over the next 12 months and expect it to benefit the Hong Kong banking industry at large.

2.1 Key findings

- Regtech adoption is at an early stage in the Hong Kong banking market with opportunities for further growth. Most banks are using at least some form of Regtech in their operations and are positive about the potential benefits of Regtech.
- While many banks have started using Regtech, most commonly in Financial Crime, Regtech is only employed in a low percentage of risk management and regulatory compliance activities. However, the breadth of Regtech adoption is expected to increase over the next 12 months, especially for regulatory themes such as Conduct and Customer Protection, Regulatory and Tax Reporting, and Regulatory Compliance Obligations.
- Banks plan to significantly increase the headcount allocated to Regtech over the next 12 months, but capital investments are likely to be gradual.
- Better quality and control combined with lower costs are seen as key benefits of Regtech. An improved customer experience is also mentioned as a benefit, demonstrating that banks are also thinking more broadly about the beneficiaries of Regtech adoption.
- Key barriers to Regtech adoption include budget constraints, a lack of awareness of the potential value of Regtech solutions, challenges with integration with current technology systems and infrastructure, and low ecosystem participation.
- Virtual banks are outperforming other banks in terms of the overall RAI score, larger banks are further ahead of the smaller banks, and Hong Kong-headquartered banks are ahead of those headquartered outside of Hong Kong.

2.2 Factors correlating with higher levels of Regtech adoption

Leading Adopters – defined as those banks that apply Regtech to at least two regulatory themes and for 20% or more of activities within these two themes – make up 31% of all respondents surveyed for this report. More details on the regulatory themes and Regtech application areas can be found in Section 7. Leading Adopters provide insights into the specific behaviours, actions, and corporate decisions that correlate with higher levels of Regtech adoption, and help to identify focus areas for banks that want to advance Regtech adoption. The factors correlating with higher levels of Regtech adoption are:

- Understanding the benefits of Regtech and having experienced success from adoption.
- Active participation in the Regtech ecosystem through partnerships, collaborations, and involvement in industry associations.
- Having employees either dedicated to or having a material focus on Regtech.
- Regular and structured Regtech training.
- A culture of innovation and leadership championing Regtech.
- Suitable systems, data, and infrastructure to enable the application of Regtech solutions.

2.3 Actions for banks

The actions banks can take to further their Regtech adoption are outlined in Section 5. These suggestions are in line with the actions that the HKMA has outlined as part of

its roadmap to accelerate adoption in the banking sector in the white paper. While there are varying levels of Regtech maturity across Hong Kong's banks, for those wanting to set the right foundations to become a Leading Adopter, three key actions that can be taken today are:

- 1. Develop a Regtech strategy and assign or establish Regtech leadership roles:** Creating a clearly defined strategy that tracks benefits and having focused leadership that advocates the use of Regtech are essential to driving Regtech adoption.
- 2. Foster Regtech expertise:** Having Regtech-focused employees, providing them with access to structured training alongside hands-on experience, and increasing Regtech awareness more broadly across the organisation will help banks to identify opportunities for Regtech adoption and increase their capabilities to develop and implement Regtech solutions.
- 3. Engage with the Regtech ecosystem:** Stronger engagement with peer banks and Regtech experts is linked to higher Regtech adoption. Employees that are active in and connected within the ecosystem are likely to contribute to higher levels of Regtech adoption. Better ecosystem engagement will also enhance banks' awareness of various Regtech technologies and vendor solutions in the market as well as government support and initiatives that are available, such as the Financial Services and the Treasury Bureau's (FSTB) Fintech Proof-of-Concept Subsidy Scheme² that can support banks in their Regtech adoption journey.

We hope that the insights and suggestions offered in this report, supported by the many initiatives and actions that the HKMA is leading, planning, and involved in will help banks and Regtech solution providers to move forward with Regtech adoption.

About this research

The research for this report is based on:

- An online data collection exercise including responses from **147 Authorized Institutions** in Hong Kong, conducted in October and November 2020.
- **10 in-depth interviews** with banks in Hong Kong and Regtech solution providers offering services to the Hong Kong market.
- **Findings from the HKMA white paper**
- **Subject matter expertise** across the HKMA and the KPMG network.

More details of the research design are covered in Section 3.

We would like to take this opportunity to thank all the survey respondents and interviewees who kindly contributed to this Regtech Adoption Index report.

² The FSTB launched the Fintech Proof-of-Concept Subsidy Scheme to encourage traditional financial institutions to partner with fintech companies to conduct proof-of-concept projects on innovative financial service products, (<https://pocsubsidy.cyberport.hk/>)

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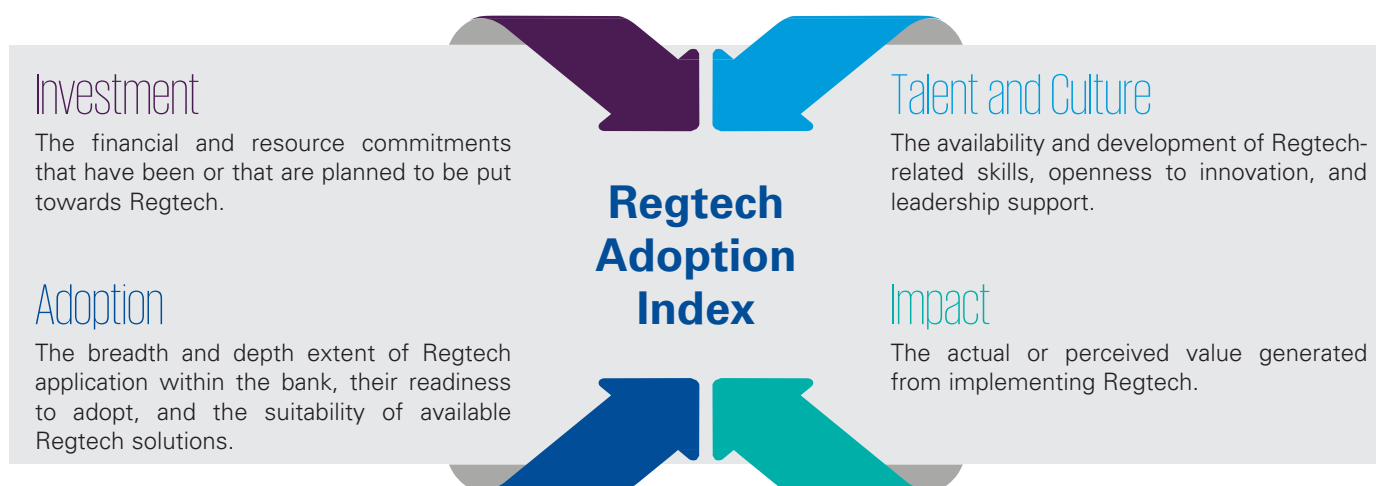
Research design

3.1 The research framework behind the Regtech Adoption Index

The RAI is a comprehensive measure to evaluate Regtech adoption by banks in Hong Kong. It covers the actual adoption rates, intent to adopt, and key enablers for

adoption. It comprises four distinct pillars: Investment, Adoption, Talent and Culture, and Impact (Figure 3.1). By incorporating all these elements into the RAI, a holistic and balanced framework to measure banks' propensity and preparedness to adopt Regtech is created.

Figure 3.1: Overview of the Regtech Adoption Index's four pillars



The four pillars were identified through careful deliberation about what drives and enables Regtech adoption among banks in Hong Kong. Each pillar is made up of several individual measures – indicators – which when combined, provide a well-rounded view of each of the four areas. The pillars and their reasons for inclusion are highlighted below.

Investment pillar: The financial and resource commitments that have been or that are planned to be put towards Regtech. It includes capital investment and headcount allocation as well as other investment relating to the Regtech ecosystem such as partnerships, collaborations, and involvement in industry associations. Investment in Regtech and innovation in general reflects a bank's intent to implement and derive value from Regtech.

Adoption pillar: While the Investment pillar looks at financial and resource commitments being put towards Regtech, the Adoption pillar is focused on the application of Regtech as well as the systems and structures in place to support its application. The pillar covers the breadth and depth of Regtech application within banks, their readiness to adopt Regtech in terms of strategy, governance, systems, infrastructure, and data, the suitability of available Regtech solutions, and the sufficiency of external guidance. The actual adoption of Regtech, where organisations have not only expressed an interest but have implemented Regtech solutions, indicates greater maturity. The suitability of solutions and guidance provided by the government and government agencies are also considered as key enablers for more widespread adoption.

Talent and Culture pillar: This pillar covers the availability and development of Regtech-related skills, openness to innovation, and leadership support. Having access to Regtech talent and the ability to develop Regtech knowledge and capabilities are essential for adoption. A culture and leadership that embrace innovation and new ways of working indicate the organisation's willingness and readiness to experiment with new technologies such as Regtech.

Impact pillar: The actual or perceived value generated from implementing Regtech. It includes the effectiveness of Regtech in enhancing the quality of control and compliance, the contribution of Regtech to cost and operational efficiency, and its ability to benefit the Hong Kong banking sector. If the impact of Regtech is perceived to be positive, organisations are more likely to start or continue to adopt Regtech.

A detailed description of the pillars and the indicators is included in Section 7.



3.2 Data collection methodology and sample size

Two parallel data collection processes were undertaken to inform the RAI. A larger-scale **online data collection** exercise was done with banks, and separately **in-depth interviews** were conducted with senior executives from banks and Regtech providers.

Online data collection

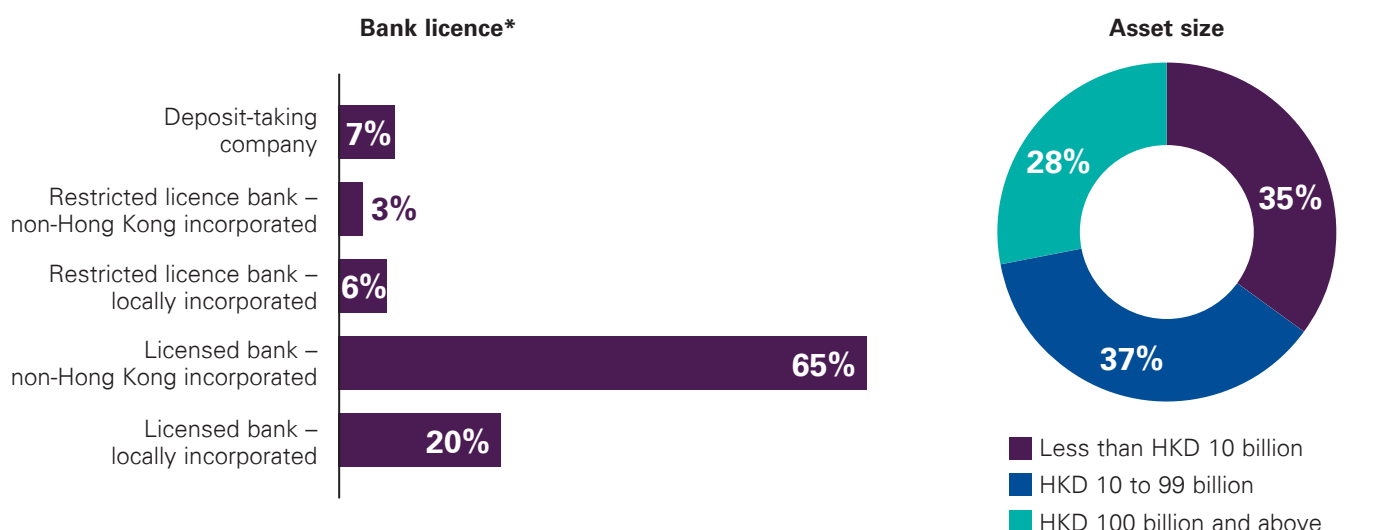
The target respondents for the online data collection were Authorized Institutions. All 190 Authorized Institutions with valid licences during the data collection period were invited to access an online data collection platform where

representatives of the bank could submit their responses. One representative from each bank was asked to complete the data collection on behalf of the entire organisation.

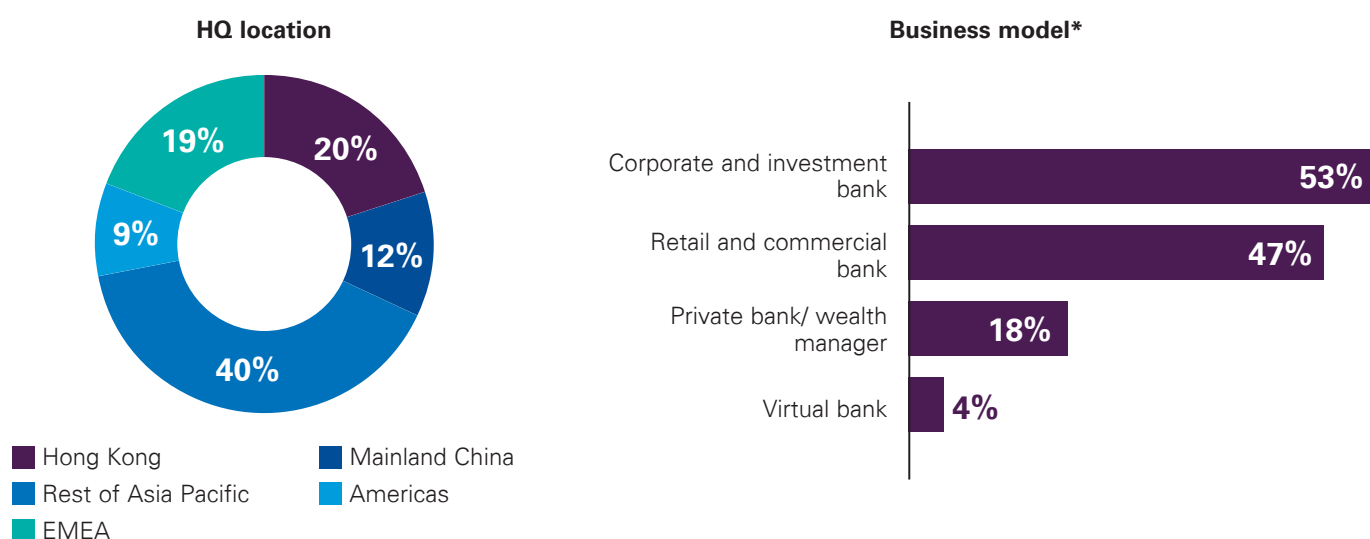
All data collection took place on a platform independent from the HKMA, and the data collection period lasted from 19 October to 16 November 2020. All responses were treated anonymously.

A total of 147 responses were collected from banks, representing 77% of all Authorized Institutions licensed by the HKMA. Figure 3.2 provides an overview of the profile of respondents in the data set.

Figure 3.2: Profile of surveyed banks



*Percentages may not add up to 100% due to rounding



*Percentages may not add up to 100% as banks may have more than 1 type of license

Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

In-depth interviews

The in-depth interviews were conducted to gain a more detailed understanding of banks and Regtech solution providers' motivators, barriers, and challenges to Regtech adoption. Eight interviews were conducted with banks of different sizes and headquarter locations as well as two interviews with Regtech solution providers. The interviews covered qualitative questions to understand what influences Regtech adoption and gather additional insights into the data collection results.

3.3 Index calculation process

The online data collection platform included questions linked to the indicators making up each of the four pillars of the RAI. These are described in more detail in Section 7.

The answer to every question included in the data collection was scored using a fixed scoring mechanism, awarding more points to responses at the higher end of the various scales. An algorithm was created to calculate the pillar and total scores for each respondent. The total score is a weighted average across the pillars. The weighting of each pillar was informed by banks during data collection and in-depth interviews. The overall RAI score is the average index score across all respondents.

The RAI is an individual level index, which means that each individual respondent has their own RAI score. This way, it is possible to compare average RAI score by business model, asset size, and any other dimension collected during the data collection exercise.

Further details on the weighting are included in Section 7.



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The Regtech Adoption Index

4.1 The Regtech Adoption Index 2020 and key findings

The inaugural RAI score shows that Regtech adoption is at an early stage with opportunities for future growth

The 2020 RAI (Figure 4.1) reveals that Hong Kong's banks have embarked on their journey of Regtech adoption. It also shows clear opportunities and scope for future growth.

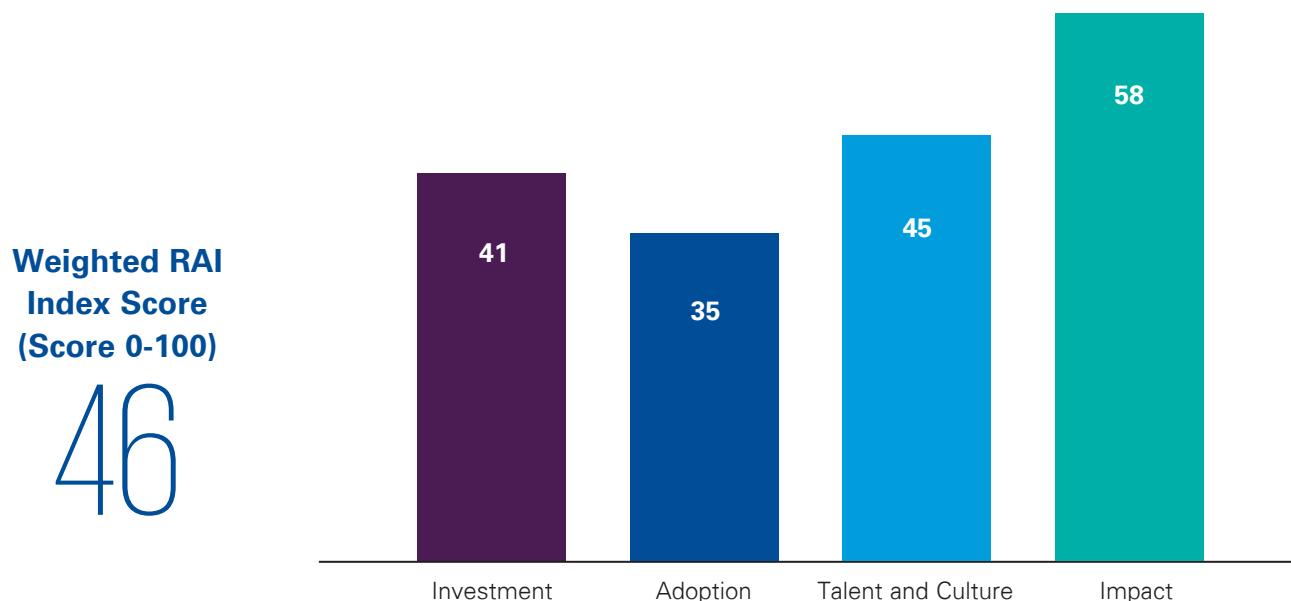
A majority of banks see potential benefits from Regtech for their own organisations and the Hong Kong banking sector. Most banks are also using at least some form of Regtech in their operations. However, the depth of adoption is relatively low, indicating that more growth is possible in the next few years.

Pillar differences give clues to barriers and drivers

As Figure 4.1 shows, Impact scores the highest of the four pillars, demonstrating the high expectation that banks have of Regtech in general. The Adoption pillar scores the lowest, which shows that while many banks have started adopting Regtech, it is only being used in a small percentage of risk management and compliance activities. Investment and Talent and Culture scores are at intermediate levels, which can be explained by the relatively early-stage investment plans and lack of structured training and leadership for Regtech.

This section provides an overview of key trends and insights, while an in-depth analysis of each pillar is outlined in Section 5.

Figure 4.1: The Regtech Adoption Index 2020 and pillar scores

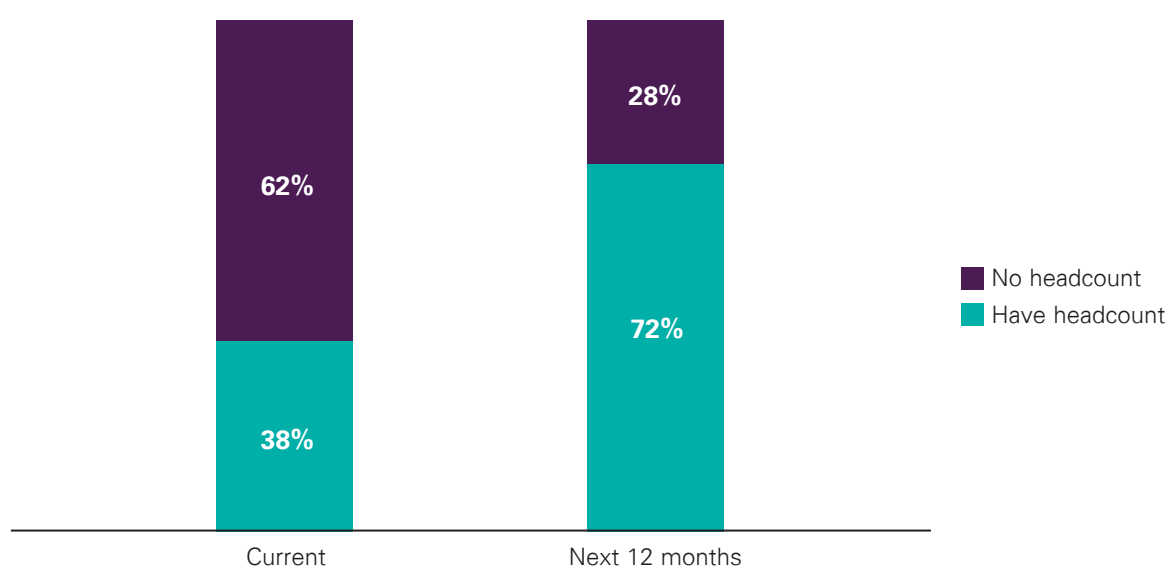


Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Increased Regtech adoption is expected over the next 12 months

Banks are likely to allocate more headcount to Regtech over the next 12 months. While 38% of banks currently have headcount aligned to Regtech, this is expected to increase to 72% over the next 12 months (Figure 4.2).

Figure 4.2: Percentage of banks that have Regtech headcount, current and next 12 months



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Although Regtech headcount is likely to grow quickly, capital investment towards Regtech will likely be more gradual, with most banks planning to keep investment levels unchanged (Figure 4.3).

Figure 4.3: Planned budget changes for Regtech in the next 12 months



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Financial Crime is where Regtech is currently most widely used, and almost half of the surveyed banks are already using Regtech for Risk Management (Figure 4.4). Growth in Regtech adoption is expected across the other four regulatory themes, particularly Conduct and Customer Protection and Regulatory and Tax Reporting (Figure 5.7).

Figure 4.4: Percentage of banks currently adopting Regtech by regulatory theme



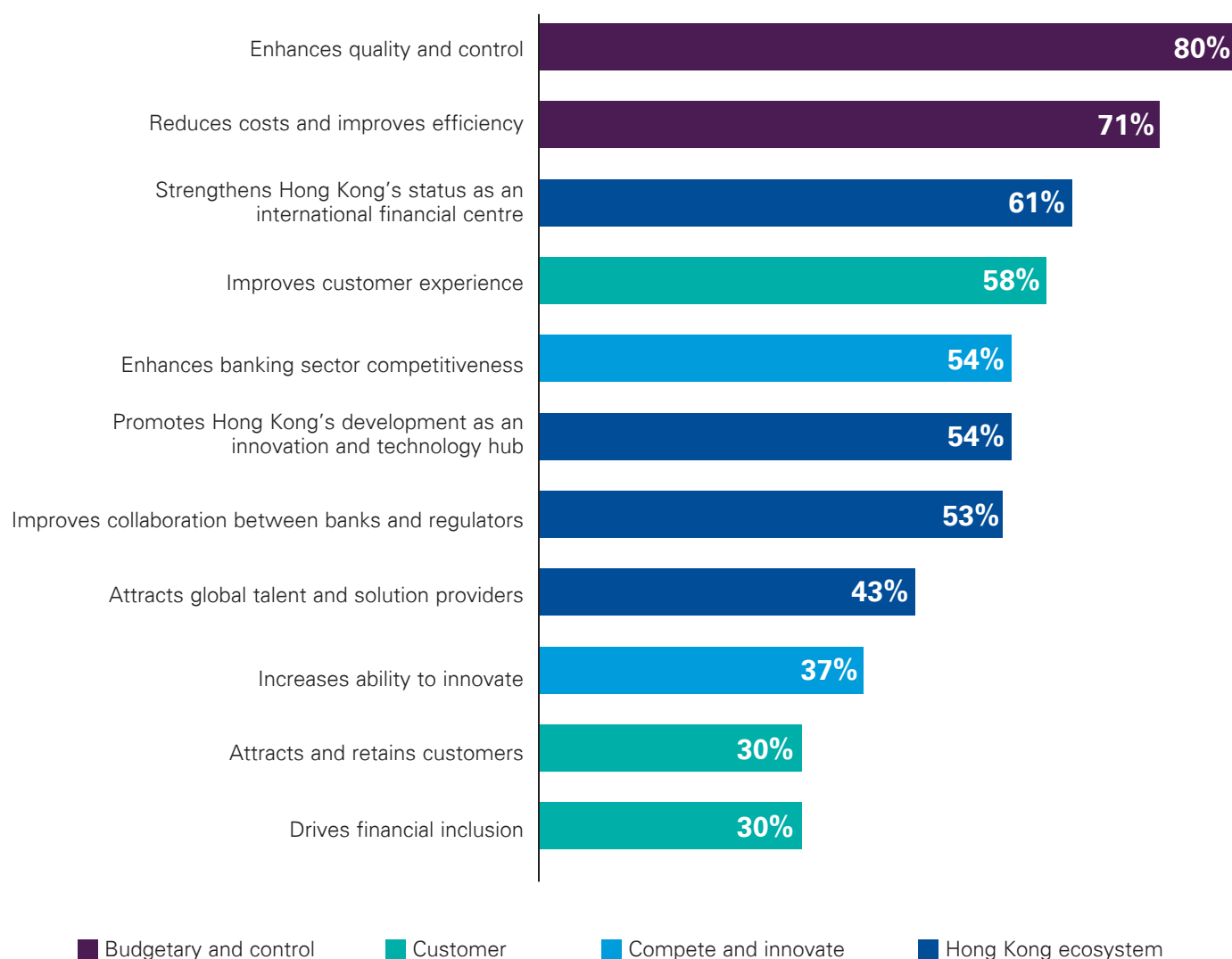
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

A key driver for Regtech adoption: better quality and control at lower costs

Most banks report enhanced quality and control and cost reduction as key benefits of Regtech. Notably, improved

customer experience is also mentioned as a benefit, clearly indicating that banks look beyond internal processes and efficiencies when it comes to Regtech adoption (Figure 4.5).

Figure 4.5: Percentage of banks that view the following as benefits of Regtech to the Hong Kong banking industry



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Lack of funding, low readiness of own infrastructure, lack of awareness, and low ecosystem participation are key barriers

Lack of funding is the barrier most often cited by banks, especially the smaller banks. A related barrier is the lack of awareness of the potential value of Regtech solutions. With many banks yet to realise benefits from Regtech adoption within their own organisations, publicly available use cases that showcase successful Regtech implementation in other organisations will be important for promoting the benefits of Regtech. Most banks are challenged by their current technology infrastructure. 78% of banks say that their own infrastructure needs some level of change in order to be ready for Regtech adoption (Figure 5.9). Investing in infrastructure, systems, and data will help to prepare banks for Regtech adoption.

Ecosystem participation by banks is nascent, with the majority claiming that they are not partnering or collaborating with Regtech firms and/ or Regtech-related associations and groups. We will show in the next section that greater interaction with peers and Regtech solution providers is linked with higher levels of Regtech adoption.

Virtual banks, banks with large asset sizes, and Hong Kong-headquartered banks have higher RAI scores

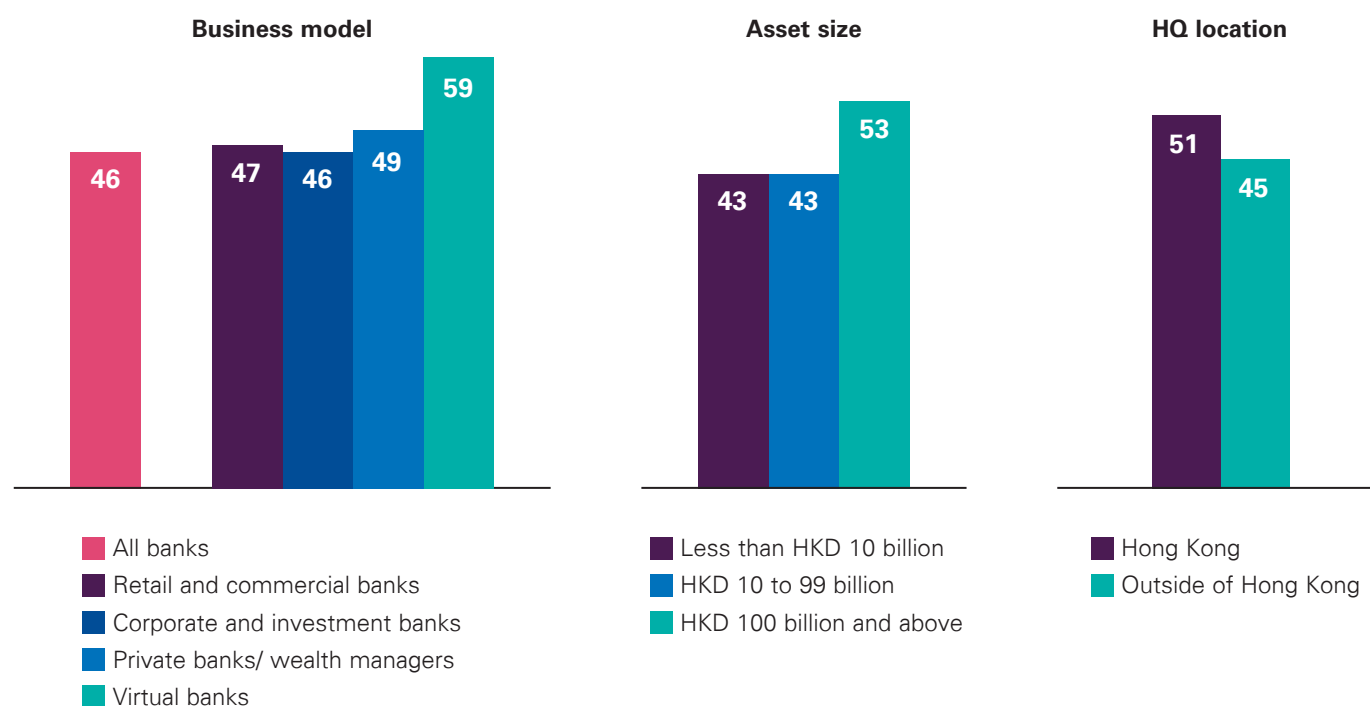
The RAI framework allows banks to be compared across different dimensions in terms of their level of Regtech adoption. Figure 4.6 shows that virtual banks form the group with the highest overall RAI score. As virtual banks started without legacy infrastructure and are digital natives, they have leveraged extensive technologies, including Regtech, to deliver more digital products and services. For example, the rapid account opening processes that many virtual banks provide could not have been possible without the use of Regtech.

Larger banks are also further ahead in terms of their RAI scores. One of the barriers to adoption is identified as the funding and investments that are required, and the larger banks may have more financial capacity to make the required investments.

It is also promising to see that Hong Kong-headquartered banks are relatively ahead of non-Hong Kong-headquartered banks in terms of Regtech adoption in Hong Kong. Hong Kong's technology ecosystem and fintech capabilities appear to have been good catalysts encouraging locally-headquartered banks to embrace Regtech.



Figure 4.6: Regtech Adoption Index 2020, by business model, asset size and HQ location



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020



4.2 The Leading Adopters lens



Definition

Banks applying Regtech to at least two regulatory themes and for 20% or more of activities within these two themes. They make up 31% of all banks surveyed for this report.

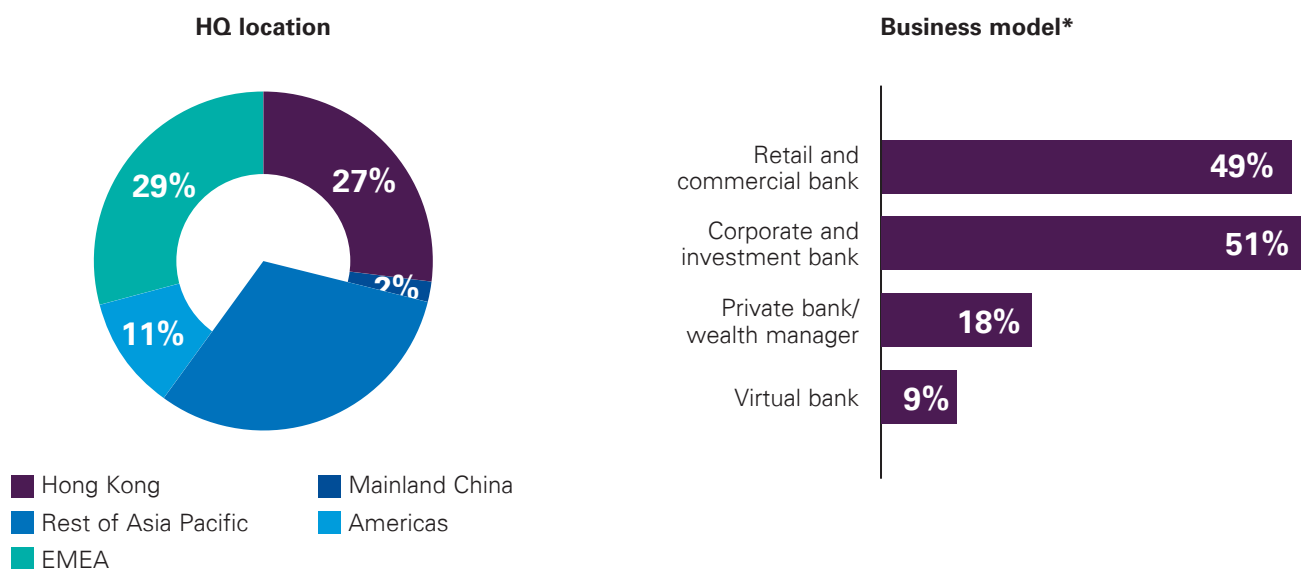
The analysis in this report uses an approach that splits the respondents into two groups based on their current level of Regtech adoption. The first group, Leading Adopters, is defined as banks that apply Regtech to at least two regulatory themes and for 20% or more of activities within these two themes. More details on the regulatory themes and Regtech application areas can be found in Section 7.

Leading Adopters make up 31% of all respondents. The other group – the Non-Leading Adopters – is made up of all other remaining banks. With this approach, we identify one set of banks that are clearly leading in terms of adoption, and when comparing this group with the rest, we can understand what sets them apart (Figure 4.7).

Figure 4.7: Leading Adopters characteristics and performance

Who are the Leading Adopters?

The Leading Adopters represent a mix of different business models and headquarter locations.

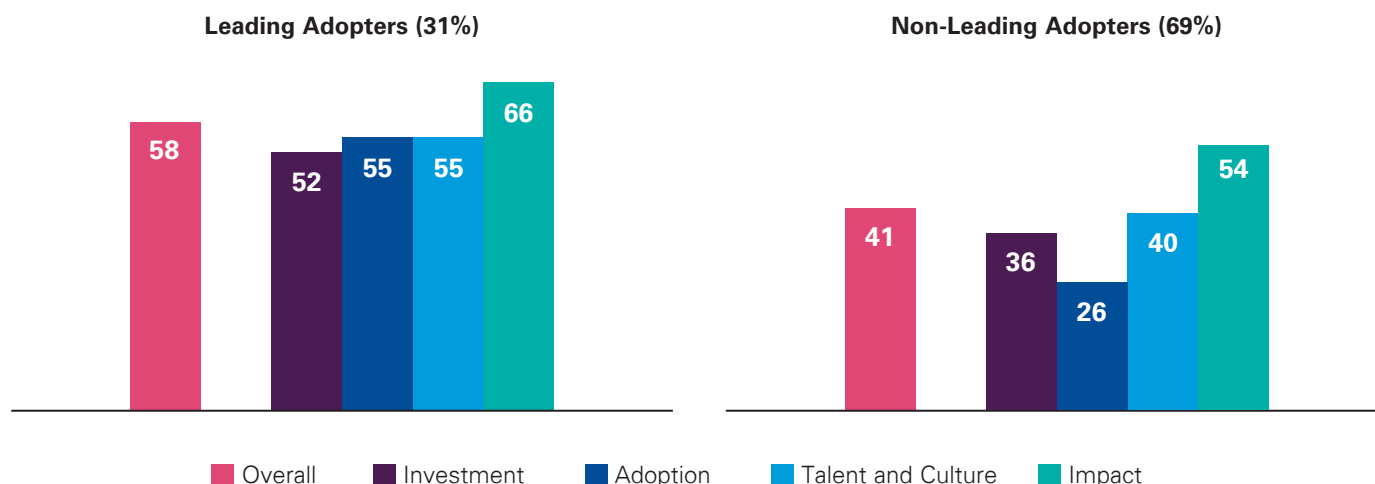


*Percentages may not add up to 100% as banks may have more than 1 business model

Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

How do the Leading Adopters perform?

Leading Adopters score around 41% higher than Non-Leading Adopters, and they excel in every pillar, particularly in the Adoption pillar.



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

4.3 Key themes influencing Regtech adoption

Reviewing the data across Leading versus Non-Leading Adopters allows for the identification and validation of factors that correlate with higher Regtech adoption. Based on this analysis, it is possible to uncover key insights that will help to inform actions that banks and other ecosystem participants can take to increase Regtech adoption. These insights also help to validate the HKMA's Regtech initiatives and provide direction on what Regtech service providers can do to support Regtech adoption among Hong Kong's banks.

Key themes that inform what the HKMA, banks, and Regtech solution providers can do to increase adoption

Understanding the benefits of Regtech: Proven success – generating value and realising benefits from adopting Regtech – as well as positive sentiment towards Regtech's contributions correlate with increased adoption. The research shows that Non-Leading Adopters are more likely to identify a lack of awareness of the potential value of Regtech solutions as a key barrier to adoption than Leading Adopters.

Regtech ecosystem involvement: Banks with higher levels of adoption are more active within the Regtech ecosystem, having more partnerships and collaborations, and participating in associations and industry groups more than banks with lower levels of adoption.

Regtech-focused employees: Having staff either dedicated to or having a material focus on Regtech is crucial for identifying, implementing, and maintaining Regtech solutions. More Leading Adopters (58%) have Regtech-related headcount in place than Non-Leading Adopters (29%).

Regular and structured training: Regular and structured training is an important foundation for Regtech adoption. Banks with lower levels of adoption have either no or mostly incidental Regtech-related training.

A culture of innovation and leadership support: Openness to technology, having an innovation mindset, and leadership support are crucial for Regtech adoption. Banks that are open to new technology scored higher on the index than those that are neutral or not open to new technology.

Suitable systems, data, and infrastructure: Widespread Regtech adoption is not possible without having the right systems, data, and infrastructure in place. Legacy infrastructure complexities are identified as a key barrier to adoption by banks. Almost half (42%) of Leading Adopters feel their organisation is ready to adopt Regtech solutions with regard to their current systems, infrastructure, and data compared to only 13% of Non-Leading Adopters.

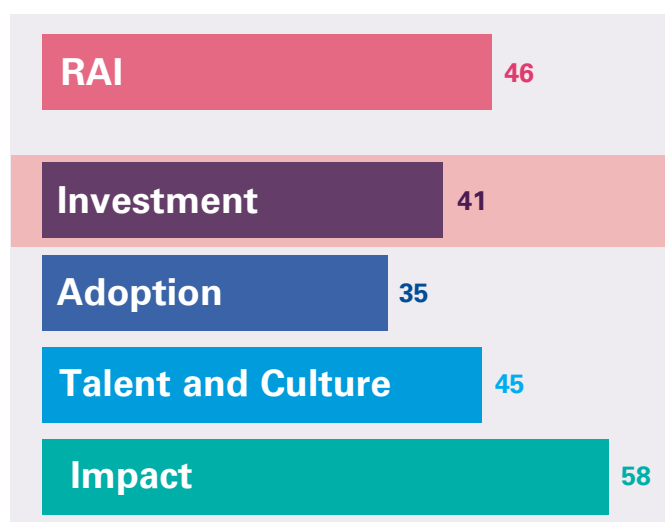
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Regtech Adoption Index

pillar deep dives

Exploring each of the RAI's four pillars provides a detailed view into the current state of Regtech adoption among Hong Kong's banks as well as the key enablers for, and barriers to, more widespread adoption.

5.1 Investment



The Investment pillar of the RAI includes financial and resource commitments that have been or are planned to be put towards Regtech, and it is ranked in the mid-level across the four pillars. It also includes other investments such as banks' participation in the Regtech ecosystem and views on Regtech investments by others.

Financial commitments to Regtech are relatively low today

In the past 12 months, 74% of banks (Figure 5.1) put at least some budget towards Regtech-related initiatives. While most banks are spending on Regtech, the levels are relatively low, with 36% spending the equivalent of between 1% and 10% of their compliance budget on Regtech. The percentage of compliance budget is used as a comparative measure as most banks have no dedicated Regtech function. A percentage, rather than absolute terms, allows for better comparison across banks of different sizes.

The potential for future spending on Regtech is demonstrated by a sub-group of banks: the recently emerged virtual banks. While the number of virtual banks in the data set is small, the results indicate that they lead in spending on Regtech: two-thirds of the surveyed virtual banks (66%) say they spent more than the equivalent of 20% of their compliance budget on Regtech.

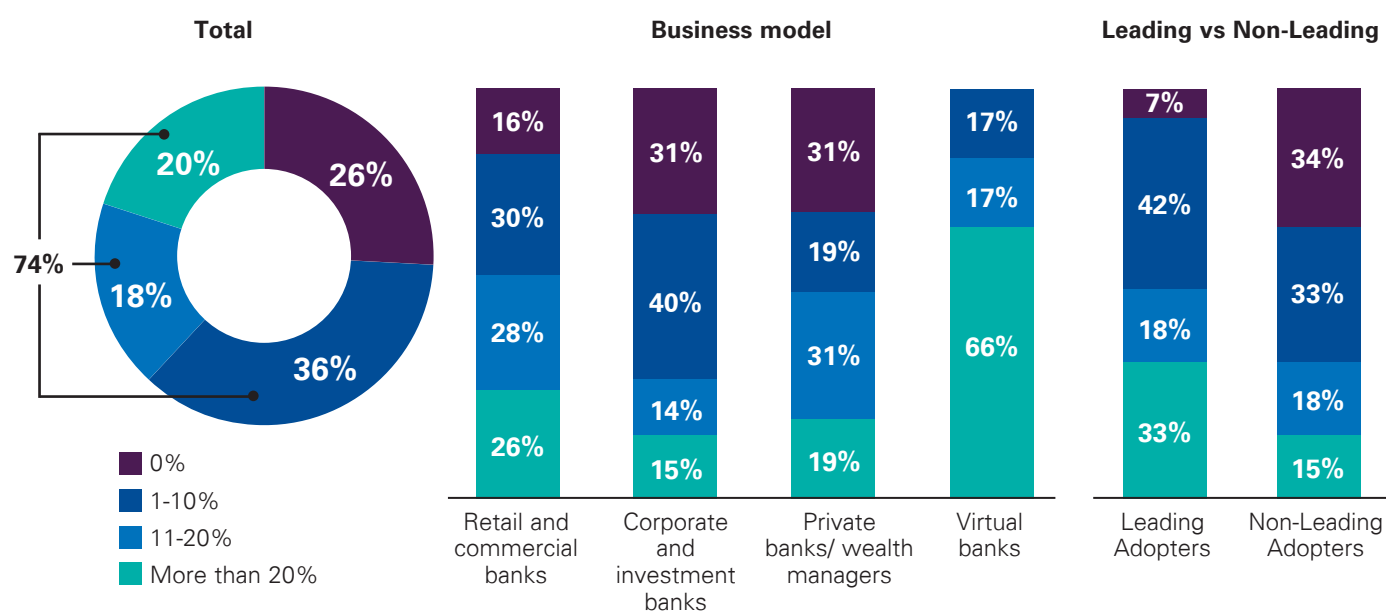
Leading Adopters

The Leading Adopters lens illustrates how banks that are ahead in Regtech adoption are also spending significantly more on Regtech. Among Leading Adopters, 33% spend more than the equivalent of 20% of their compliance budget on Regtech, more than twice as many as among Non-Leading Adopters, where only 15% show similar levels of expenditure on Regtech (Figure 5.1).

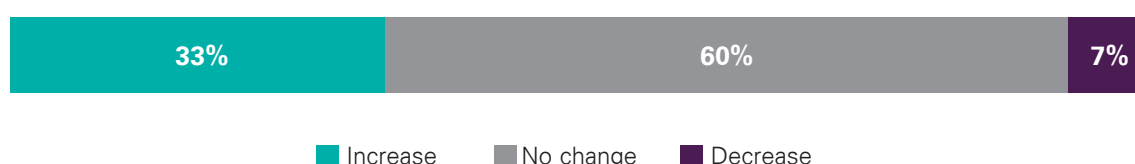
Looking ahead, about one-third of banks plan to increase their budget allocated to Regtech (See 'Planned changes to budget for Regtech in the next 12 months' in Figure 5.1). While this suggests that investments in Regtech will increase in the future, more banks intend to increase their Regtech-related headcount than to simply increase their budget allocated to Regtech. This signifies a clear shift to increase not just the awareness and understanding of Regtech, but also the capacity to identify and implement Regtech solutions within banks.

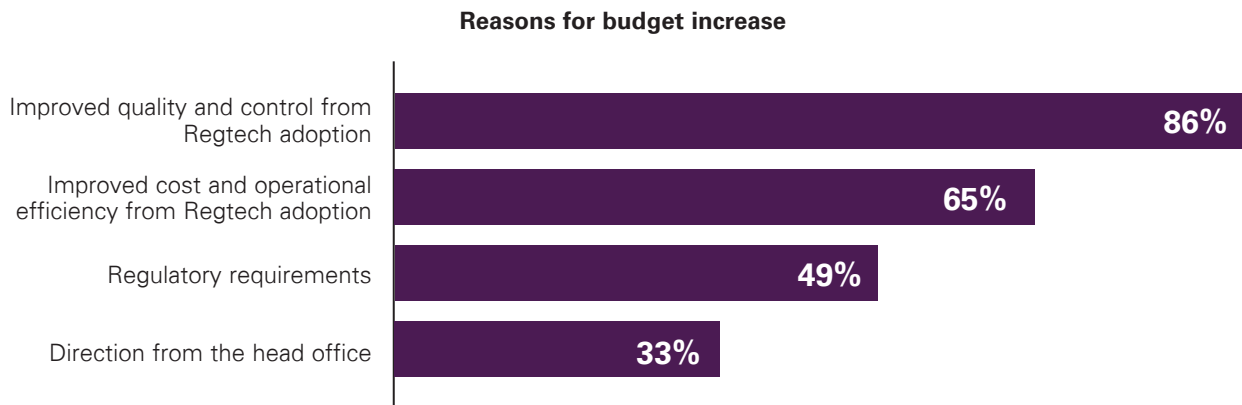
Furthermore, the research shows that quality and cost are primary drivers of Regtech budget increase. The banks that do plan to increase their Regtech budgets are focused on 1) improved quality and control and 2) improved cost and operational efficiency.

Figure 5.1: Budget for Regtech (expressed as a percentage of compliance budget) and planned Regtech budget changes



Planned changes to budget for Regtech over the next 12 months





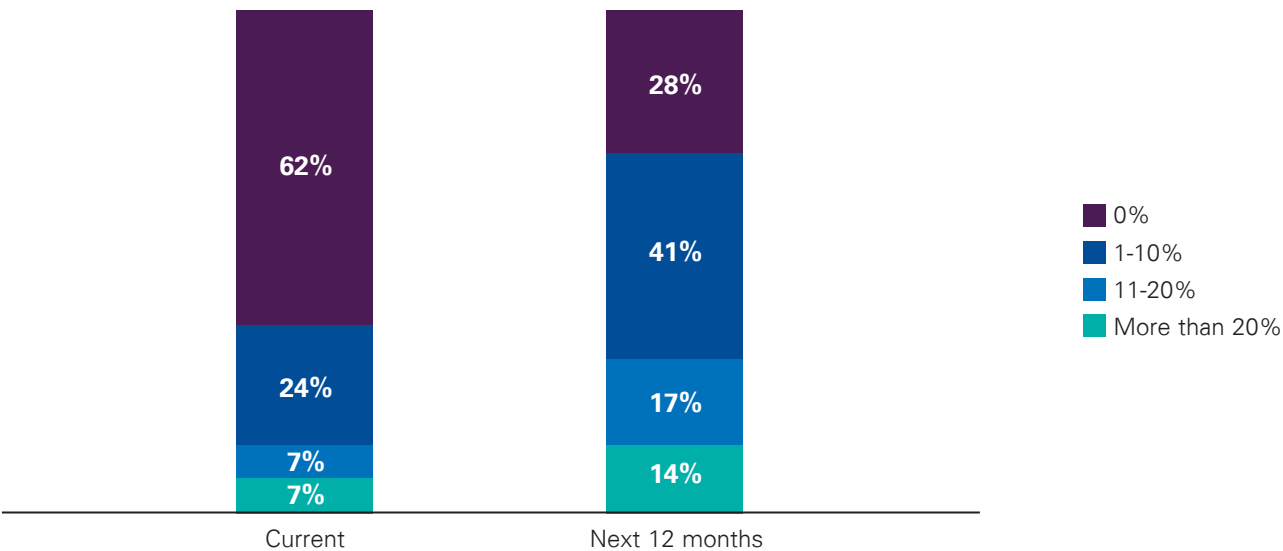
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

However, banks look to increase headcount allocation to Regtech over the next 12 months

Compared to financial commitments (74% of banks have at least some budget applied to Regtech), the headcount levels committed to Regtech are at an earlier stage. Only 38% of banks have at least a small percentage (1% or more) of their compliance, risk management, and related employees aligned to or currently working on Regtech initiatives covering Hong Kong (Figure 5.2). This suggests that most banks currently have no resources that are focused exclusively on Regtech.

Looking ahead, headcount commitments to Regtech are expected to increase, and possibly quite quickly. Over the next 12 months, 72% of banks indicate that they plan to have at least some headcount (1% or more related employees) aligned to Regtech, which would be a near doubling from the levels seen today. If banks stick to their plans, this would likely boost Regtech adoption.

Figure 5.2: Percentage of banks that have headcount aligned to Regtech, by level, current and next 12 months



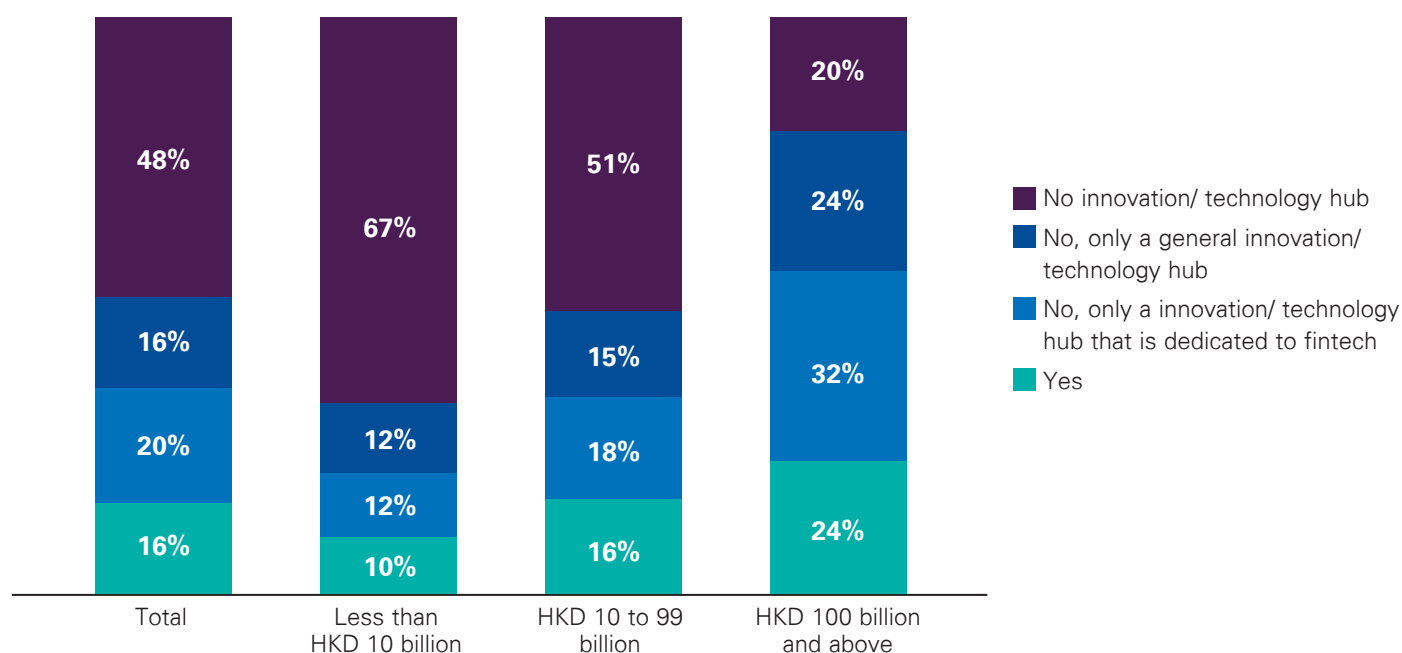
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Most larger banks have technology and innovation hubs supporting Regtech development

Whether dedicated to Regtech or not, innovation and technology hubs are another indicator of commitment to technology adoption in the future. While about half of the surveyed banks (52%) have innovation or technology hubs,

just 16% have one that is devoted to Regtech (Figure 5.3). 20% have fintech innovation hubs which are not dedicated to Regtech. The data also shows that larger banks are more likely to have such innovation or technology hubs. The data also shows that larger banks are more likely to have such innovation hubs. This is in line with the in-depth interview findings that larger banks are more likely to develop solutions in-house and hence may have a greater need for technology hubs.

Figure 5.3: Percentage of banks that have a dedicated Regtech or Regtech-focused innovation/ technology hub, total and by asset size*



* Percentages may not add up to 100% due to rounding

Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020



Participation of banks in the Regtech ecosystem is nascent

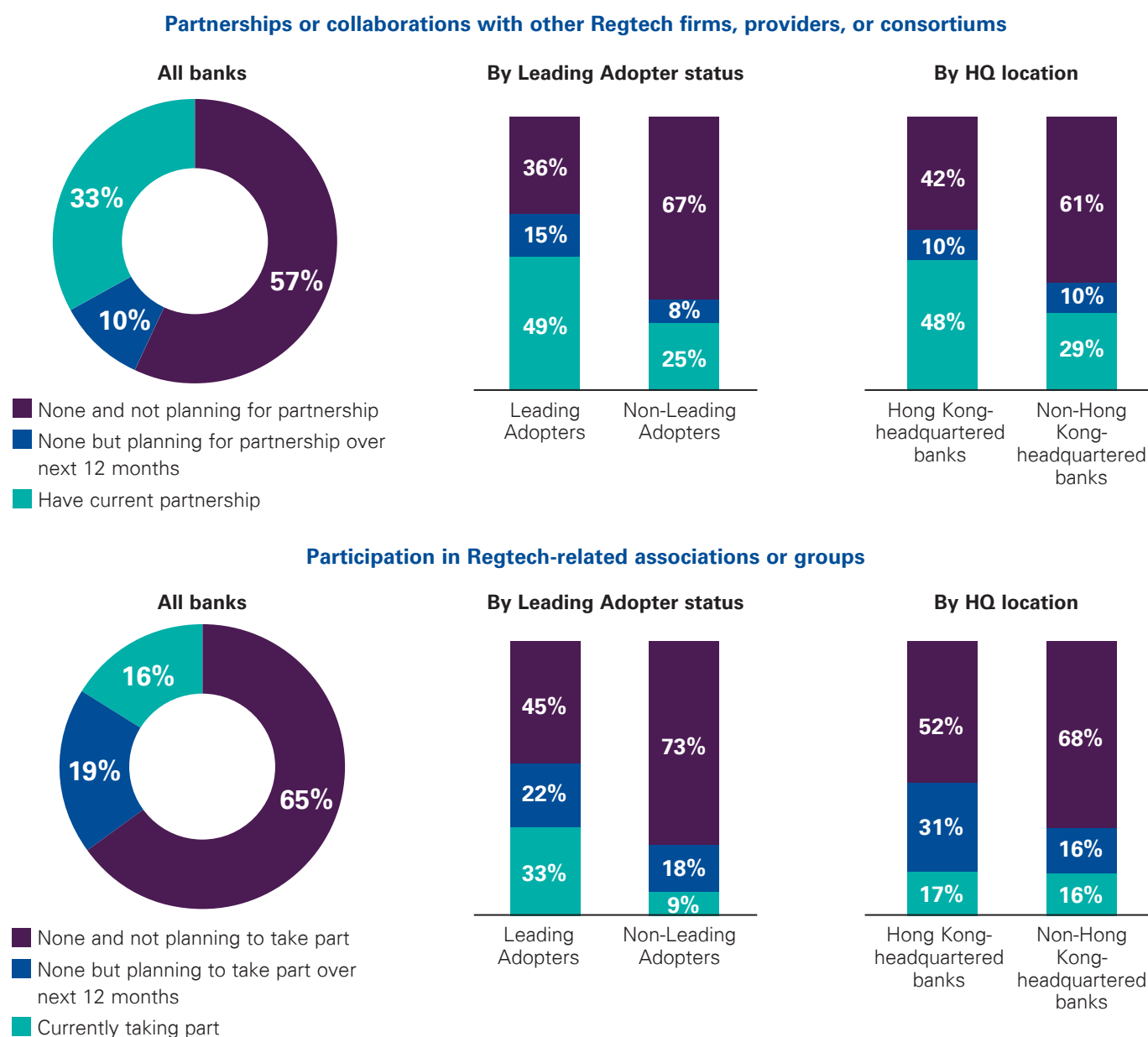
Only 16% of banks are currently taking part in associations and industry groups, and only 33% of banks are partnering with other Regtech firms, providers, or consortiums. This is lower than what we would expect to see when considering that ecosystem participation presents a good avenue for banks to interact with solution vendors, peer banks, and regulators and learn from the sharing of others' Regtech experiences. In the in-depth interviews, most banks also noted that more active participation in such forums would be beneficial.

Leading Adopters

The right-hand charts in Figure 5.4 show that for Leading Adopters, ecosystem participation is higher. Leading Adopters are twice as likely, compared to Non-Leading Adopters to partner with other Regtech firms, providers, and consortiums, and they are more than three times as likely to participate in Regtech-related associations and groups.

Hong Kong-headquartered banks are also more active in the local ecosystem, with almost 50% of them having partnerships with other Regtech firms, providers, or consortiums. The fact that they do not rely on headquarters located outside of Hong Kong may help to explain why they are more active in the local Regtech ecosystem.

Figure 5.4: Percentage of banks by the level of partnership and participation in the Regtech ecosystem



In general, investments in Regtech by businesses and government are viewed as inadequate

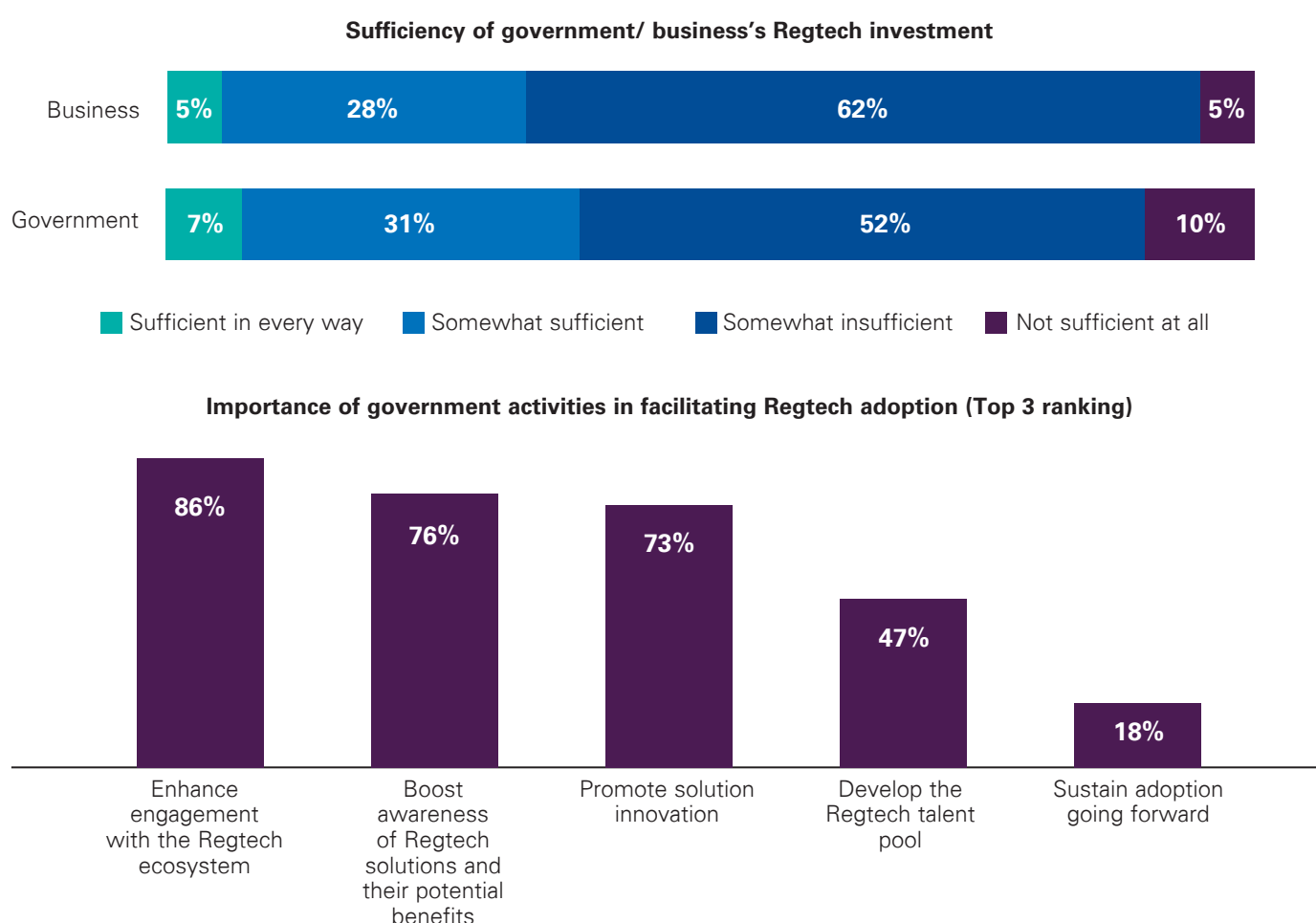
Banks were asked their views on the sufficiency of Regtech investments by businesses, the government, or government agencies. While interviewees acknowledge that good progress has been made and support was available within the Regtech ecosystem, the data collection responses indicate high expectations for more investments to be made. Figure 5.5 shows that 62% of banks believe that investment in Regtech by business, for example in Regtech development, collaboration, and event sponsorship, is somewhat insufficient, and 5% believe that it is not sufficient at all. Furthermore, 52% of banks believe that investment in Regtech by the government or government agencies is somewhat insufficient, with 10% believing it is not sufficient at all. Overall, banks feel that investments are not high enough, and this corroborates the

finding on their own investment highlighted earlier in this section. The overall picture emerging is that banks would like to see businesses, government, and government agencies increase their investments in Regtech.

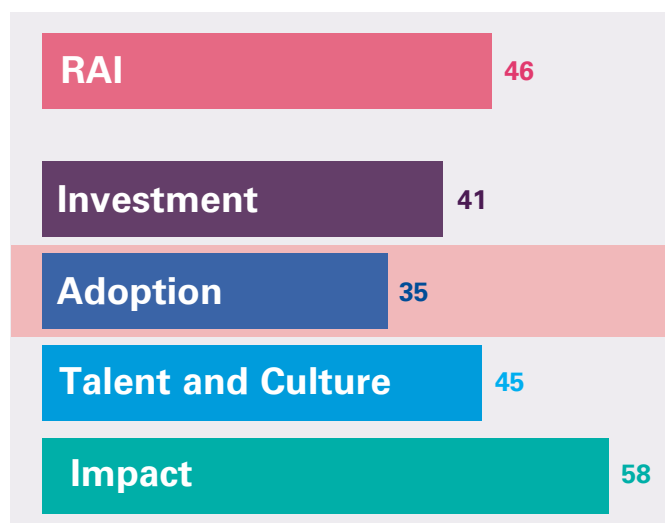
When looking at the specific areas that banks would like the government to focus on, activities that facilitate more ecosystem engagement is mentioned most often. 86% of banks ranked this as one of the top three most important government activities. Recently launched initiatives such as the FSTB's Fintech Proof-of-Concept Subsidy Scheme have been set up to encourage partnerships and provide financial assistance.

Other important areas are for the government to raise awareness of Regtech solutions and their potential benefits and promote solution innovation.

Figure 5.5: Views on Regtech investments by businesses and government and the importance of different types of government activities that facilitate Regtech adoption



5.2 Adoption



The Adoption pillar of the RAI describes to what degree banks currently use or plan to use Regtech across six regulatory themes. It also includes readiness from a strategic perspective, systems and data infrastructure readiness, and banks' perceptions on whether regulators provide enough guidance and support. The Adoption pillar has the lowest score across the four pillars, indicating that while many banks have started adopting Regtech in some shape or form, the depth of adoption is at an early stage.

Adoption status by regulatory theme

The RAI indicates that 56% of banks have applied Regtech to at least two regulatory themes within their organisations. Of these banks, only half (28%) have applied Regtech to four or more of the six regulatory themes, indicating that while banks in Hong Kong have started to use Regtech, a smaller percentage are adopting it widely across their organisations (Figure 5.6).

Banks have significant expectations from Regtech resulting in the Impact pillar of the RAI scoring the highest. In contrast, the Adoption pillar scores the lowest, showing that actual Regtech adoption in Hong Kong has the potential for growth in the coming years. To understand where and how Regtech is being used, banks were asked to indicate where they use Regtech across six regulatory themes. The six themes are (in order of most to least commonly mentioned by banks):

- Financial Crime
- Risk Management
- Conduct and Customer Protection
- Regulatory and Tax Reporting
- Regulatory Compliance Obligations
- Governance and Accountability

More details on the six regulatory themes and 26 application areas can be found in Section 7.

Breadth and depth of Regtech adoption is at an early stage, except in Financial Crime

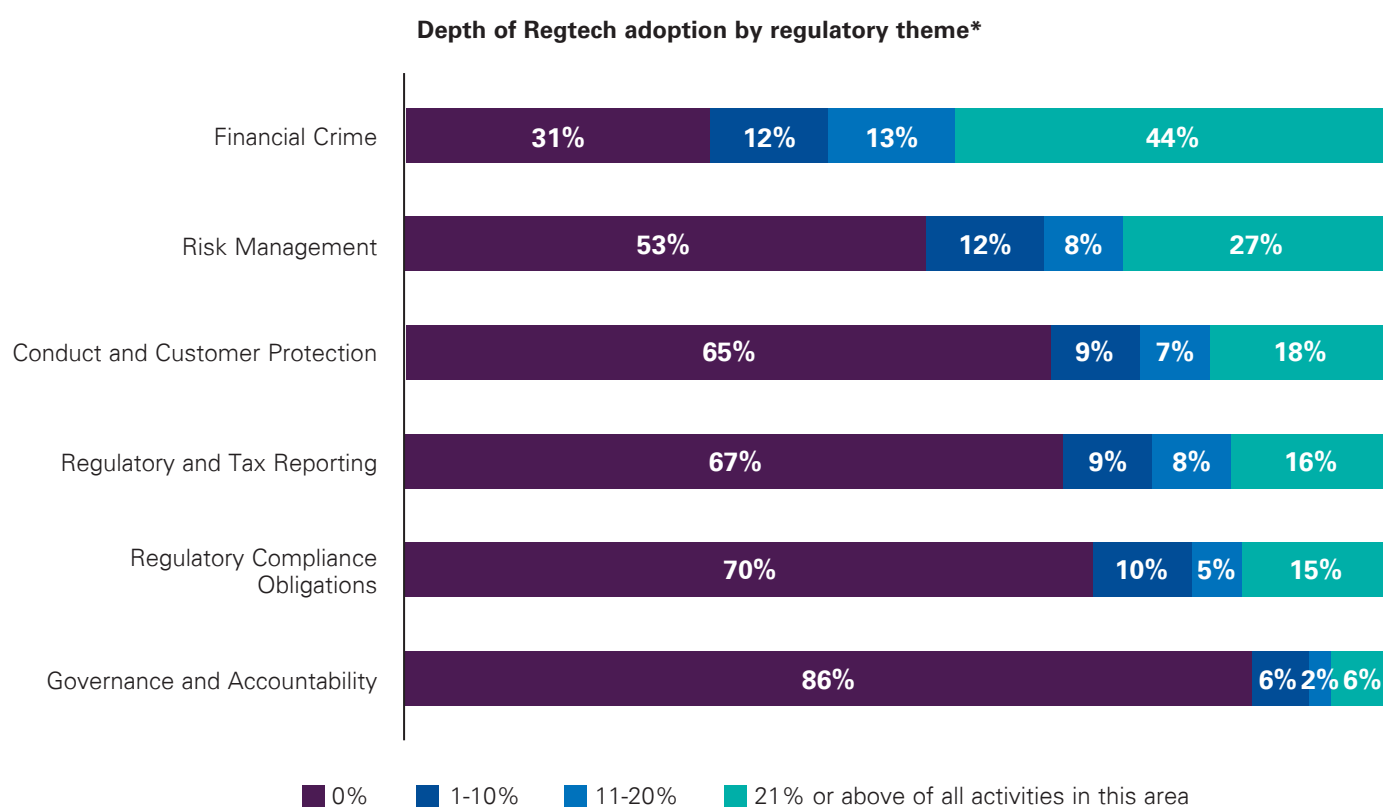
Financial Crime is the regulatory theme where most banks (69%) are currently using Regtech solutions (Figure 5.6). Of these, 44% have used Regtech in at least 20% of Financial Crime-related activities over the past 12 months. This is in part driven by the ability to automate many of the Know Your Customer (KYC) and Anti-Money Laundering (AML) compliance related processes with the use of Regtech and the availability of data. It is also a more mature area with a considerable number of proven solutions available in the market.

Risk Management has a moderate level of adoption where close to half (47%) of the banks are using Regtech. The top three application areas within Risk Management are cyber risk management, credit risk assessment and market risk management. These again are areas that have Regtech solutions available in the market and have more accessible data. We anticipate that other areas will start to receive more focus, including stress testing, third-party monitoring and risk management, and liquidity risk management.

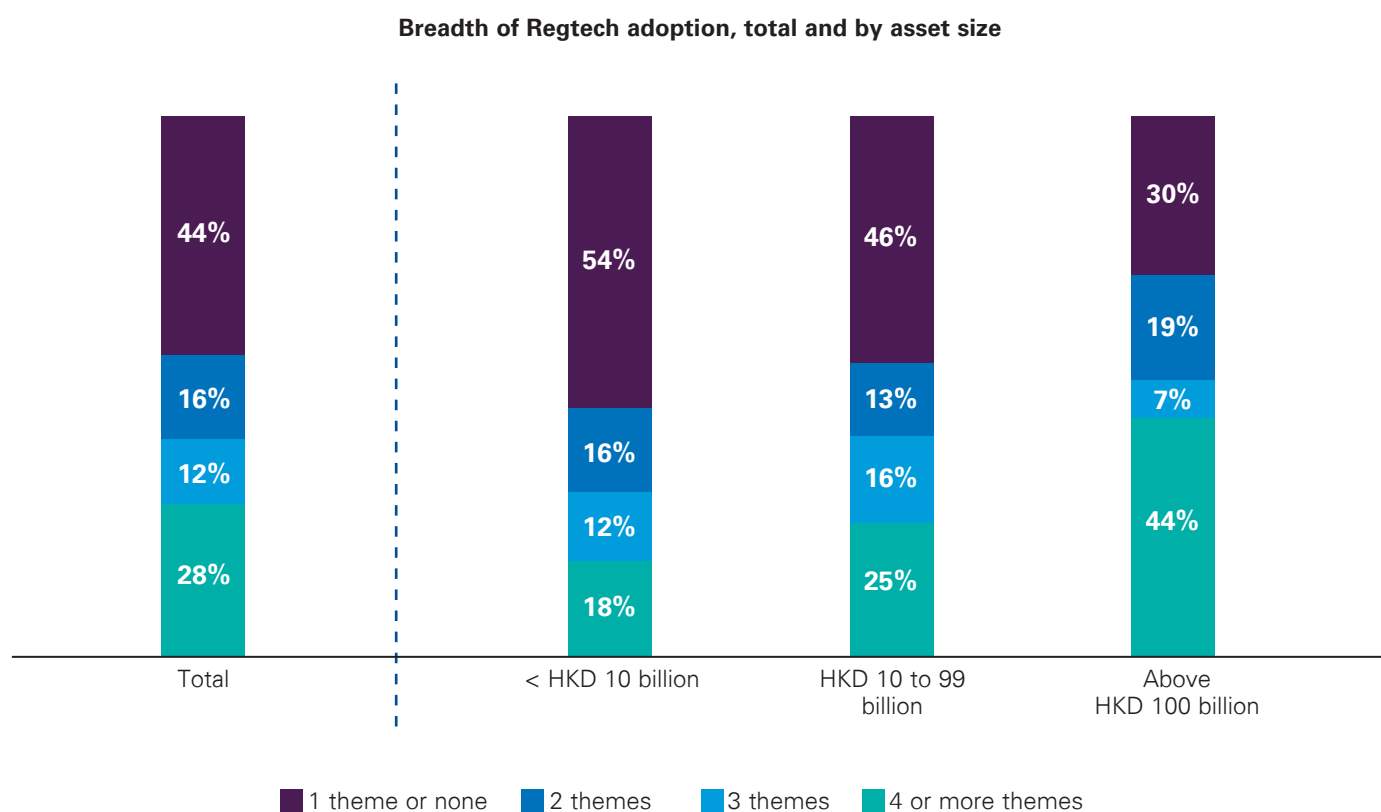
Governance and Accountability has the lowest adoption rate, with only about one in seven banks (14%) using Regtech in this area. Over the next 12 months, as Figure 5.7 illustrates, Regtech adoption in the Governance and Accountability area is expected to rise to 18% of banks.

In terms of Regtech adoption by asset size, overall adoption is higher among larger banks as shown in Figure 5.6. 44% of banks with assets over HKD 100 billion are using Regtech for four or more regulatory themes as compared to 18% of smaller banks – more than twice as many.

Figure 5.6: Breadth and depth of Regtech adoption



* Percentages may not add up to 100% due to rounding



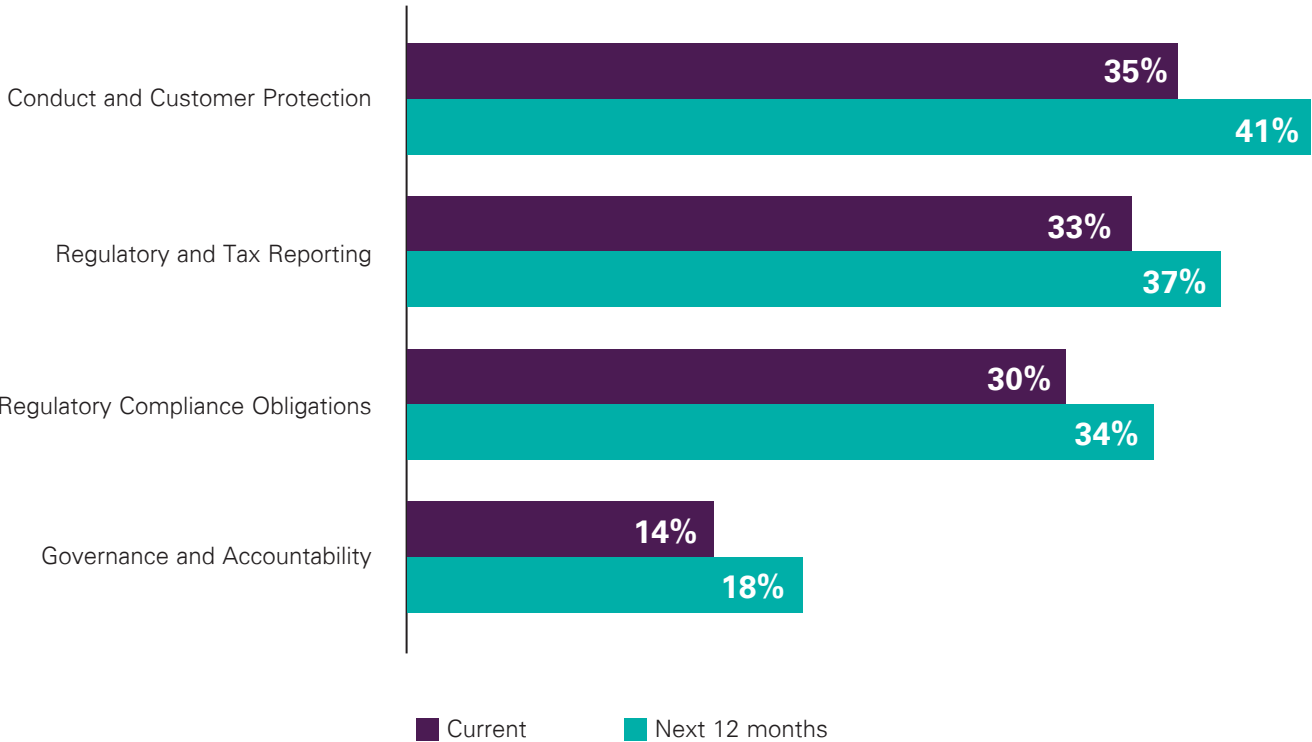
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Regtech adoption trend: breadth of adoption will increase over the next 12 months

Financial Crime and Risk Management currently have the most Regtech activities, and over the next 12 months they will continue to be the two most active. The other four regulatory themes – Conduct and Customer Protection, Regulatory and Tax Reporting, Regulatory Compliance Obligations, and Governance and Accountability – are likely to see a rise in adoption over the next year. This expansion is most likely driven by banks looking to understand how new use cases in these areas can create business benefits, rather than just focusing on existing applications of Regtech.

Regulatory and Tax Reporting, Regulatory Compliance Obligations, and Governance and Accountability – are likely to see a rise in adoption over the next year. This expansion is most likely driven by banks looking to understand how new use cases in these areas can create business benefits, rather than just focusing on existing applications of Regtech.

Figure 5.7: Percentage of banks currently adopting/ planning to adopt Regtech by regulatory theme, current and next 12 months



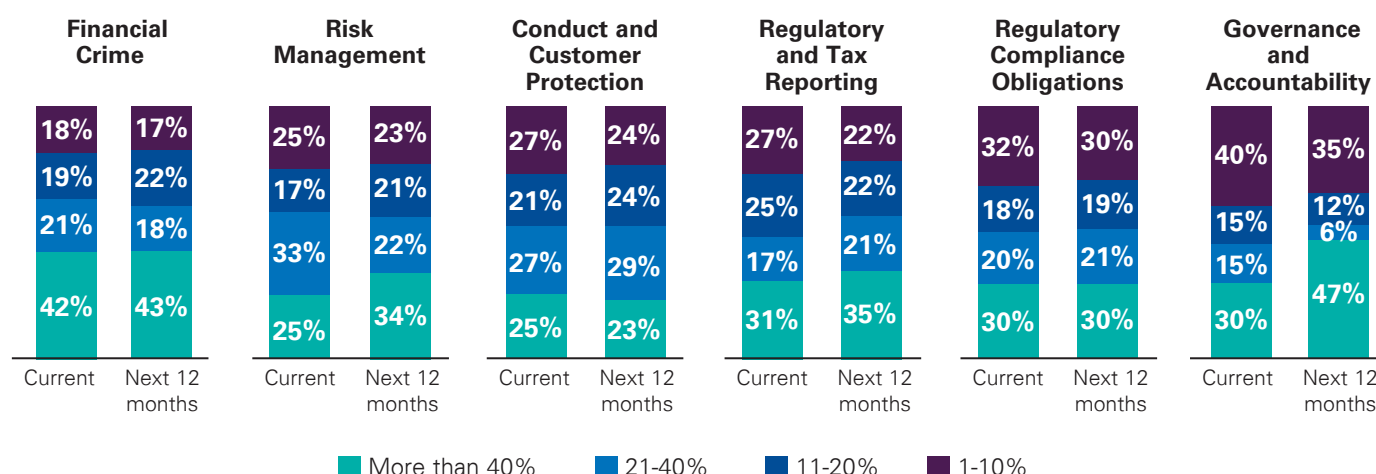
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Regtech adoption trend: depth of adoption is not likely to increase significantly over the next 12 months

Figure 5.8 shows that significant increases in the depth of adoption are not expected over the next 12 months across the six regulatory themes, with the percentages for current and future use remaining similar. Governance and Accountability is an exception; 30% of banks currently use Regtech for 40% or more of activities, and this is likely to rise to 47% of banks.

Based on in-depth interview findings, we understand that banks are often cautious when adopting Regtech. Banks need to identify and justify the business case before they can begin to adopt Regtech solutions, and multiple rounds of decision-making and user acceptance testing are often required before a solution can be fully implemented. Given the long-winded process, it will take time for banks to increase the depth of adoption of Regtech. This is equally applicable to trialling new and emerging technologies across different areas within risk management and regulatory compliance.

Figure 5.8: Depth of adoption of Regtech across different regulatory themes, current and next 12 months



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Barriers: low infrastructure readiness

Despite the optimistic outlook that Regtech adoption will increase, several barriers remain. Infrastructure readiness is one of them.

Banks claim to have a relatively low readiness of their systems, infrastructure, and data set-up for Regtech adoption. A large percentage of banks (78%) stated that further infrastructure changes would be needed before they feel ready to adopt Regtech within their organisations (Figure 5.9). This is corroborated by the relatively low level of cloud adoption within the banking industry in Hong Kong.

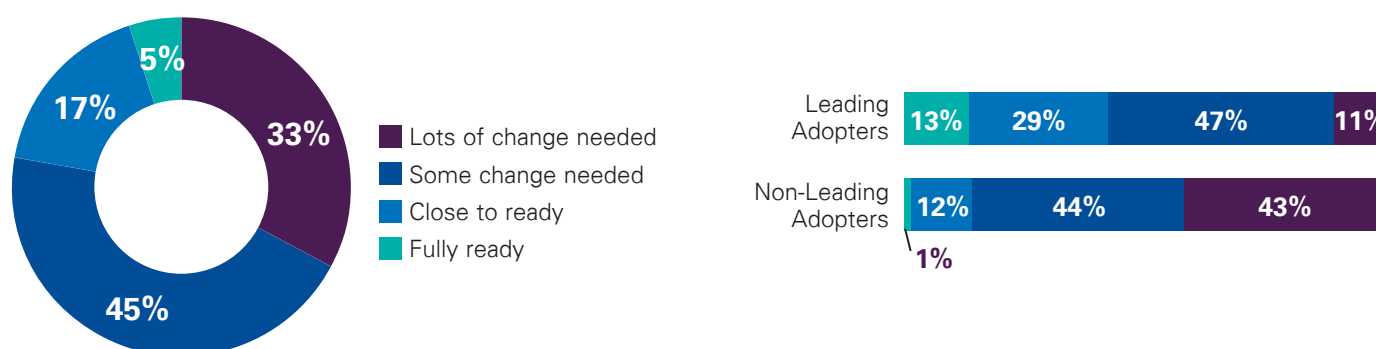
Only about one-fifth of banks believe they are ready or mostly ready to start implementing Regtech. Integrating prototypes with existing IT systems and training

employees to use the new solutions can be complicated, and larger banks in particular can find being agile a challenge. Furthermore, recognising the importance of data preparedness, many banks we interviewed say they are working hard to ensure their data can be made readily available for analysis and Regtech-related activities.

Leading Adopters

The Leading Adopters are broadly comfortable that their infrastructure supports Regtech adoption. However, for Non-Leading Adopters, infrastructure readiness is a barrier. Figure 5.9 shows that 87% of them believe that they need 'some change' or 'a lot of change' to be ready for Regtech adoption, much higher compared to the Leading Adopters.

Figure 5.9: Self-perception of readiness of infrastructure, systems, and data for Regtech implementation



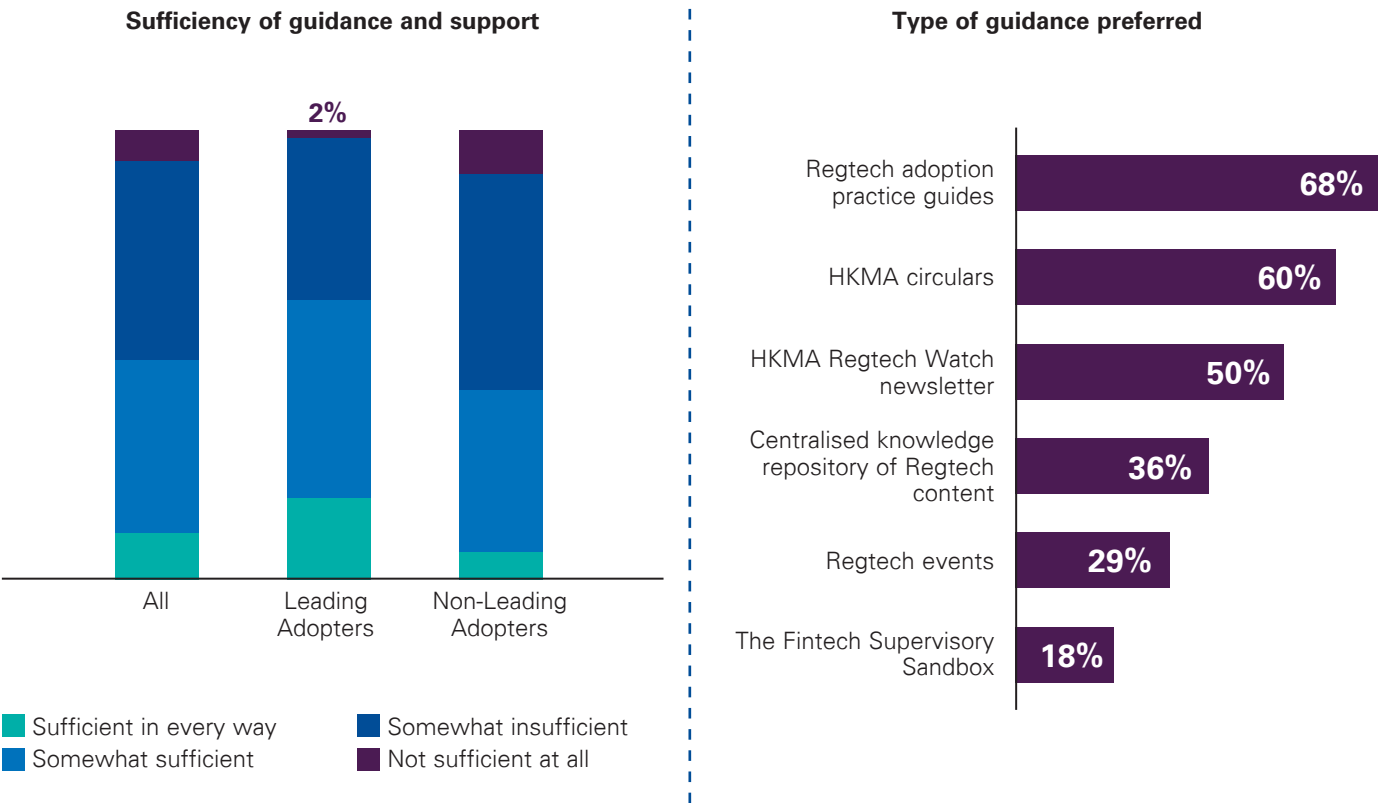
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Barriers: guidance and support within the ecosystem

The views among banks on guidance and support from regulators are balanced. When observing only the Leading Adopters, most of them believe that regulators are doing enough to support banks, which suggests that, at least

for the Leading Adopters, guidance and support is not a key barrier. As for the Non-Leading Adopters, many of them would like more support from the HKMA and other regulators (Figure 5.10). Among the types of guidance needed, the preference for technology literature such as adoption practice guides and HKMA circulars are high on the list at 68% and 60%, respectively.

Figure 5.10: Perceptions on regulatory guidance and support and types of guidance preferred



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020



Barriers: strategy and governance; just 3% of banks have robust Regtech strategy in place

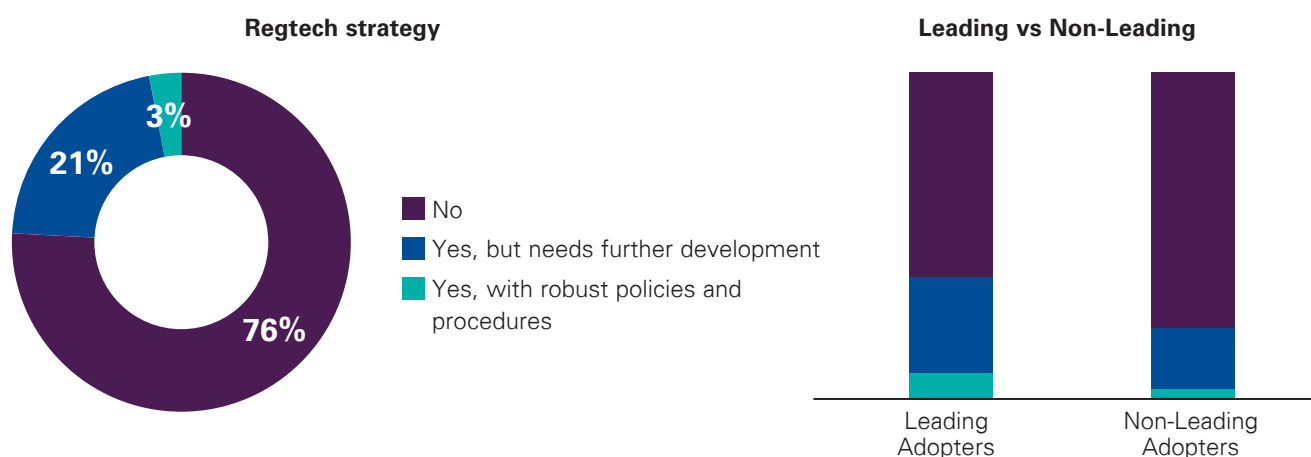
Banks also mention a considerable number of internal barriers, which can be categorised as organisational risk barriers. They include alignment of decisions globally versus regionally, risk concerns in case a solution fails, and fears over loss of compliance control. These types of risks and concerns can be mitigated by the right process and strategy to implement Regtech. This is an area with plenty of room for improvement: only 24% of banks have

a defined Regtech strategy, and among these, most (21%) indicate that it still needs further development. Overall, just 3% of banks claim to have robust policies and procedures for Regtech in place (Figure 5.11).

Leading Adopters

The Leading Adopters lens indicates that strategy and governance are crucial for Regtech adoption, as nearly twice as many Leading Adopters than Non-Leading Adopters have a defined Regtech strategy with clear metrics and KPIs in place (36% versus 20%).

Figure 5.11: Percentage of banks that have a defined Regtech strategy with clear metrics and KPIs



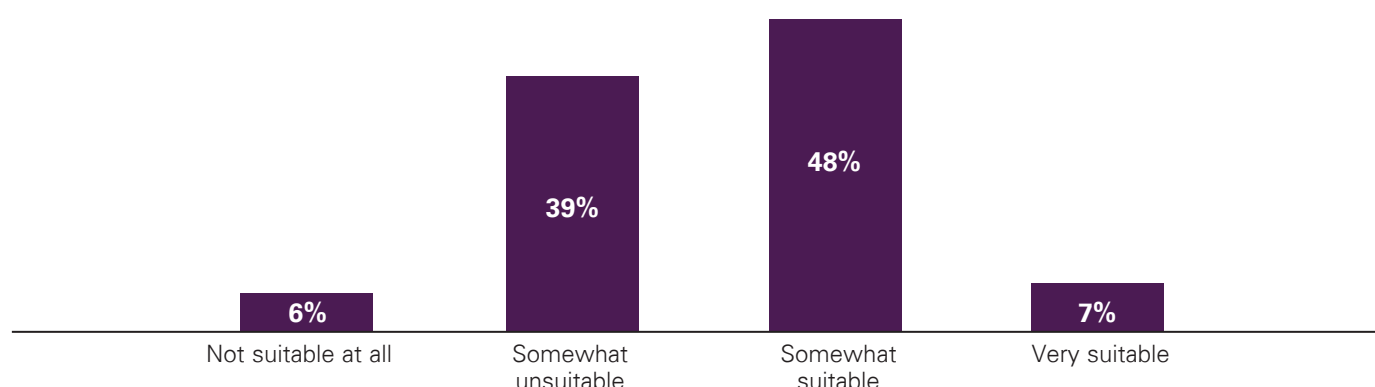
Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Barriers: availability of solutions from Regtech solution providers

Availability of vendor solutions is also mentioned as a barrier to Regtech adoption. Banks are either unable to find suitable Regtech solutions or have concerns about the vendors, such as a lack of a track record and local support and that they may not meet local regulatory requirements.

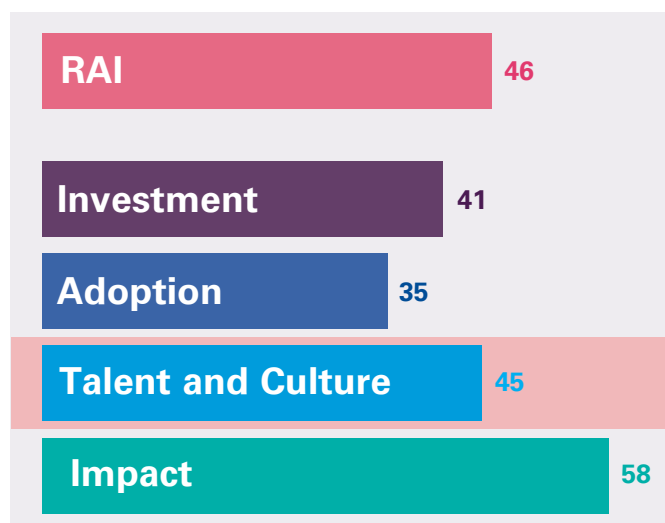
Figure 5.12 shows that more than half of banks (55%) feel that Regtech solutions available in the market are suitable, whereas 45% say that vendors can do more to improve Regtech solutions. A bank interviewee mentioned that even though vendors can provide well-established products, they are often not flexible enough to customise products to cater to banks' unique needs.

Figure 5.12: Banks' views on the suitability of Regtech solutions in the market



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

5.3 Talent and Culture



The Talent and Culture pillar scored at a similar level to the Investment pillar and ranks in the mid-level across the four pillars. The availability and development of Regtech-related skills as well as openness to innovation and leadership support are covered in this pillar.

Most banks have access to talent, but not always in Hong Kong

71% of banks say they have the skills or access to the skills required to identify, implement, and maintain Regtech solutions (Figure 5.13). Within that group, 37% have access to regional or global resources only (i.e. not in Hong Kong), while just over one-third (34%) can access talent locally, either through internal resources or through external parties.

Banks recognise the importance of having people who understand the technology, data, business operations, and regulations to help them identify Regtech use cases and drive adoption. However, finding this combination of skills and experience in one individual can be a real challenge. This is particularly true when trying to find this in the local talent pool. To address this, some banks are creating Regtech taskforces that bring expertise from these different areas and functions together.

However, while this is still emerging, banks find it difficult to dedicate enough time across these areas to focus and build momentum. Talent from more mature Regtech markets can help to benchmark and drive Regtech adoption - global banks may have an advantage.



Regtech is a new area of development in the industry. All units in the Bank shall swiftly catch up with this new knowledge and join up to contribute their expertise in making Regtech well implemented within the Bank. The Bank has a ready plan to engage all relevant subject matter experts, which includes IT, business, data experts, and risk stewards to achieve synergy in the implementation of Regtech.



Hang Seng Bank

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People who have experience from other regions and who understand the benefits of Regtech can be drivers of Regtech adoption in Hong Kong. It is common for Hong Kong banks to hire people from other firms from a different geographical location to bring in experience.

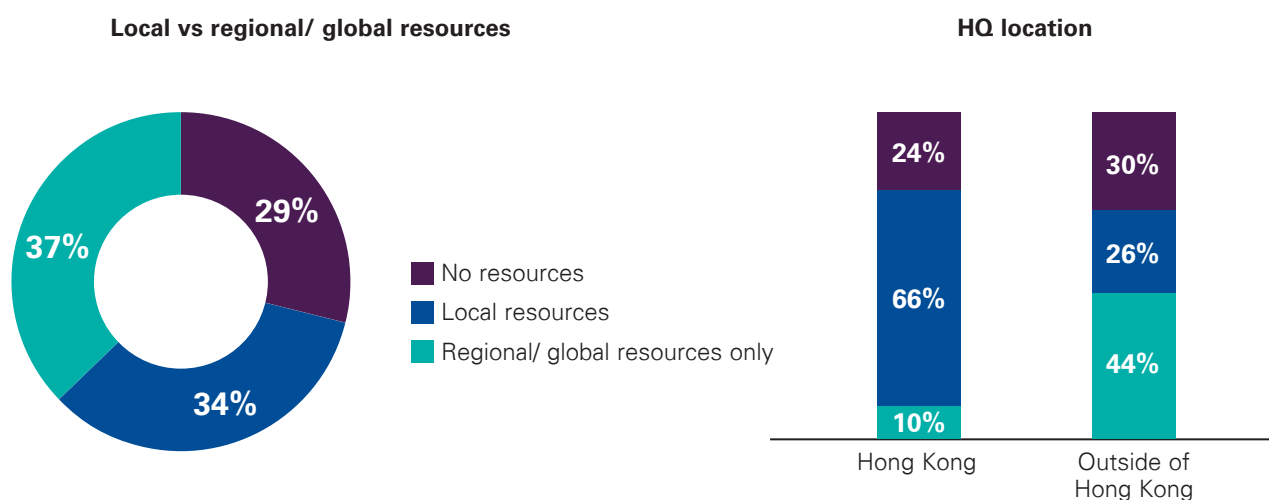
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StarCompliance

Many banks also plan to develop talent internally through training, on-the-job learning, and enabling knowledge transfer when working with vendors. Having clearly defined career paths with corresponding opportunities for growth

can also help banks to retain Regtech talent that may otherwise look to markets outside of Hong Kong for career development.

Figure 5.13: Breakdown of banks by type of access to Regtech skills either through internal resources or external parties



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Most banks do not have structured Regtech training programmes

To address the lack of access to adequate talent, proper training and development measures are needed. However, there is no clear trend of dedicated Regtech training and development existing among banks. Figure 5.14 shows that most banks either have no Regtech training at all (39%), or only have on-the-job style training within the team (31%). Given the potential benefits of Regtech and the challenges

banks currently face in acquiring the multidisciplinary skill set required to drive adoption, this may not be enough to ready their talent pool for the future.

External training is also not yet used widely, with only around 17% of banks leveraging this option. There certainly seems to be room to improve this in the future; given the increasing importance of Regtech for both banks and regulators, more could be done to equip the workforce with enough knowledge to assist in adoption.



Universities only provide courses about IT but not Regtech. To tackle this, we provide on-the-job training and classroom training about Regtech to staff. Department heads can also recommend staff to take courses and get certifications.



One of the major banks in Hong Kong

Figure 5.14: Regtech-related learning and development format



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

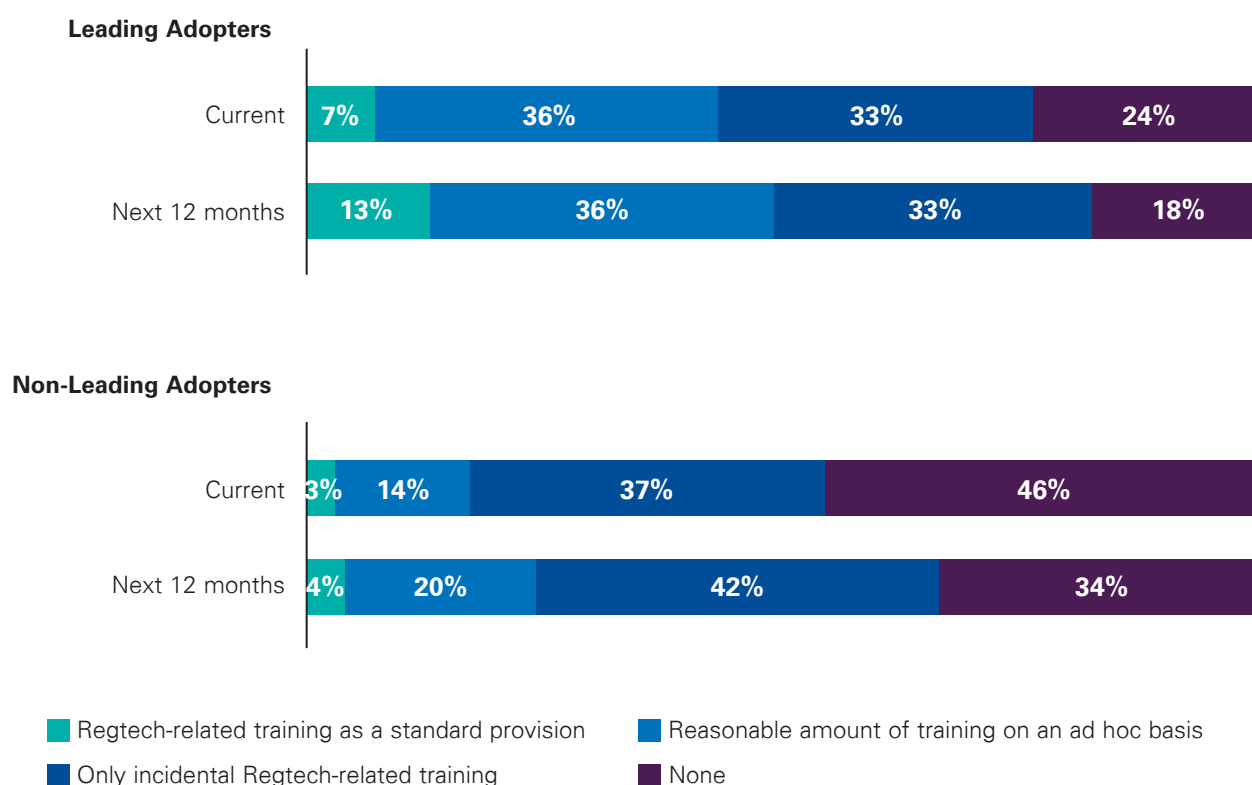
Leading Adopters

Using the Leading Adopter lens, it becomes clear that having Regtech-related learning and development in place is linked to higher Regtech adoption. Figure 5.15 shows that the Leading Adopters are more than 2 times as likely

as Non-Leading Adopters to do either a reasonable amount of ad hoc training or to have Regtech-related training available as a standard provision.

It is important to note that even the Non-Leading Adopters are planning to increase the amount of training over the next 12 months, with the percentage of banks doing no training at all dropping from 46% to 34%.

Figure 5.15: Current and future training provided by Leading and Non-Leading Adopters

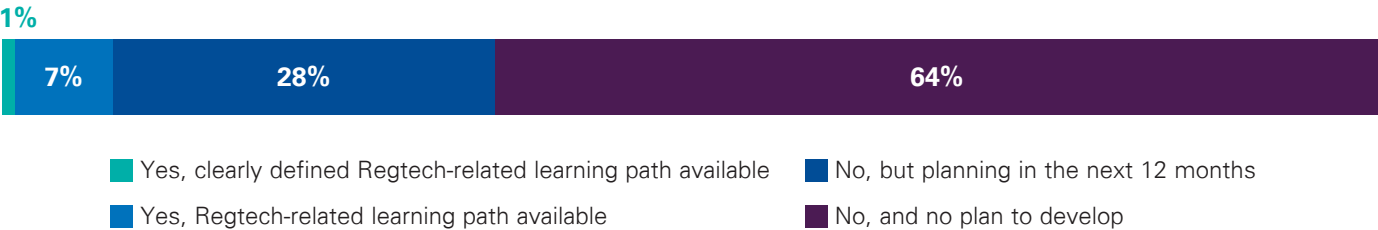


Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Given the low amount of formal Regtech training, it is unsurprising that few banks have created defined learning plans for careers related to Regtech. Only 8% of banks mentioned that they have such plans in place (Figure 5.16),

and almost two-thirds of banks do not have such plans, nor do they plan to do so over the next 12 months. Assisting banks with learning paths could be an area of assistance the ecosystem can support.

Figure 5.16: Percentage of banks that have or plan to have a defined learning path for Regtech careers

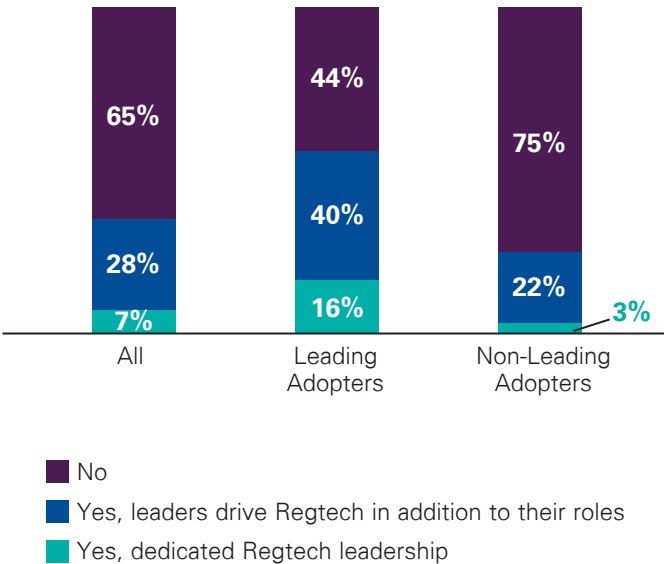


Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Only one-third of banks have leadership advocating Regtech

Even with all other measures in place, successful Regtech implementation requires recognition and support from leadership. This is an extremely critical factor, further emphasised by the Leading Adopter lens. Leadership support is important for ensuring consistency across different departments and offices, in driving economies of scale, and to approve investment budgets. While most banks acknowledge the importance of leadership support for Regtech in the in-depth interviews, only about one-third (35%) of banks surveyed have Regtech-focused leadership in place (Figure 5.17), either dedicated to Regtech or driving Regtech in addition to other roles.

Figure 5.17: Percentage of banks with leadership championing and driving Regtech



Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Leading Adopters

Leading Adopters (56%) are more than twice as likely to have Regtech leadership in place compared to Non-Leading Adopters (25%).

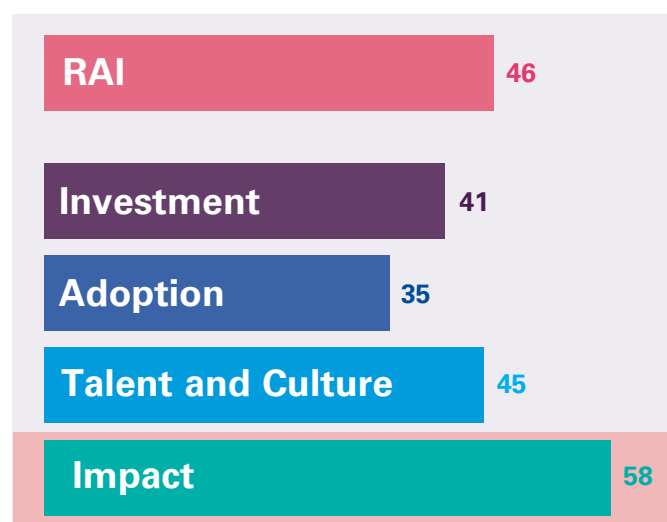
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There is clear direction from our leadership in the Hong Kong office that processes can continue to be improved, and Regtech is a tool to enable this. There is a Regtech taskforce and a digital forum to discuss various digital Regtech initiatives to ensure consistency and to achieve economies of scale.

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Citibank

5.4 Impact



The Impact pillar describes how banks regard the actual or perceived value that is generated from implementing Regtech. It is ranked the highest among the four pillars.

Positive perceptions of Regtech and high expectations for the future

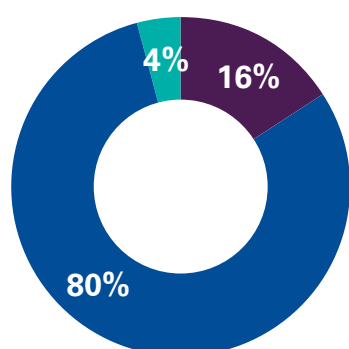
The Impact pillar is the highest scoring pillar in the RAI 2020, driven by banks' belief that Regtech can positively contribute to both their own organisations and the Hong Kong banking sector. This indicates that banks are convinced that value can be derived from Regtech and, as such, are likely to place importance and strategic focus on adopting Regtech over the coming years.

Banks expect positive contribution from Regtech over the next 12 months

Figure 5.18 depicts the high expectations banks have of Regtech. 84% of banks that participated in the study are positive about the contribution of Regtech within their own organisations over the next 12 months, and nearly all (99%) see it benefitting the Hong Kong banking sector.

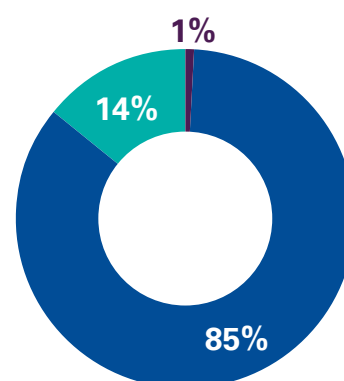
Figure 5.18: Banks' views on Regtech's contribution to their organisations over the next 12 months and Regtech's contribution to the Hong Kong banking industry

Expected contribution of Regtech in own organisation in the next 12 months



■ No contribution
■ Moderate contribution
■ Significant contribution

Banks' view on how Regtech benefits the Hong Kong banking industry



■ No benefits
■ Moderate benefits
■ Significant benefits

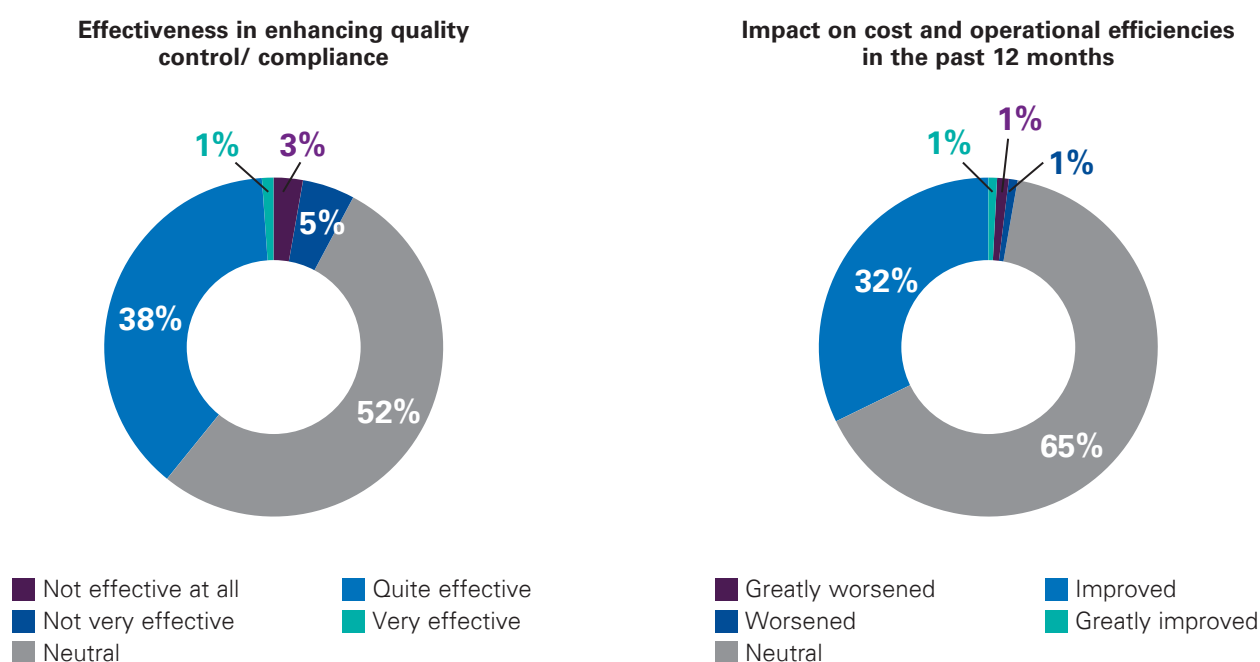
Banks are more neutral on Regtech's contribution in the past 12 months

In terms of how banks perceive the real contribution of Regtech to their own organisations, only one-third of banks saw positive contribution in the past 12 months (Figure 5.19). The remaining two-thirds are neutral about Regtech's ability to contribute to their organisation's actual cost and operational efficiency.

The picture is similar picture when looking at effectiveness in enhancing the quality control and compliance in the left-hand chart in Figure 5.19. 39% of banks are positive about Regtech's effectiveness in this respect, whereas the majority (53%) are neutral.

Overall, the analysis shows that future expectations of Regtech are very positive, but that experiences of realising actual business benefits are still quite low. This is no

Figure 5.19: Effectiveness of Regtech in enhancing the quality of control and compliance within banks and Regtech's contributions to cost and operational efficiency in the past 12 months



* Percentages may not add up to 100% due to rounding

Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

surprise given the relatively low current adoption levels (as described in Section 5.2 Adoption). The in-depth interviews present evidence that having a successful experience early on with Regtech is important for leadership buy-in and making a business case for further Regtech investment.

More needs to be done to communicate these successes, however small, to raise awareness. Looking at Leading Adopters can help us to understand the importance of Impact in driving Regtech adoption.

Leading Adopters

Leading Adopter lens: twice as many are positive on contribution to efficiency compared to Non-Leading Adopters

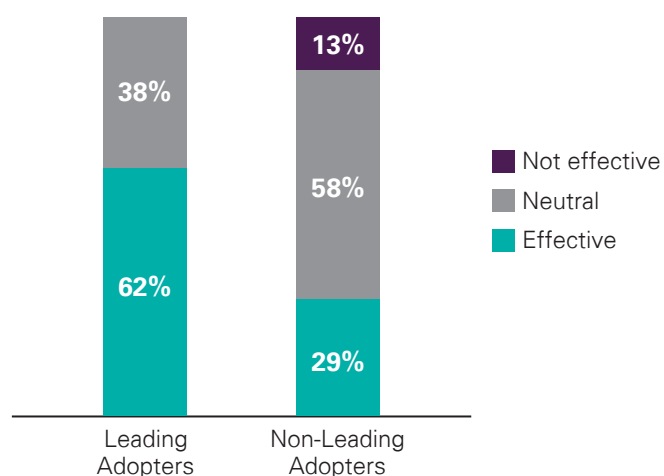
As Figure 5.20 shows, slightly more than half of Leading Adopters (51%) claim that Regtech has contributed to cost and operational efficiency in the past 12 months, compared to 25% among the Non-Leading Adopters. The findings

identify a strong correlation between realised benefits and higher levels of adoption. While we cannot definitively say whether this is due to increased adoption driving more benefits or realised benefits driving increased adoption, we do know that those with higher Regtech adoption rates are also realising and seeing more benefits.

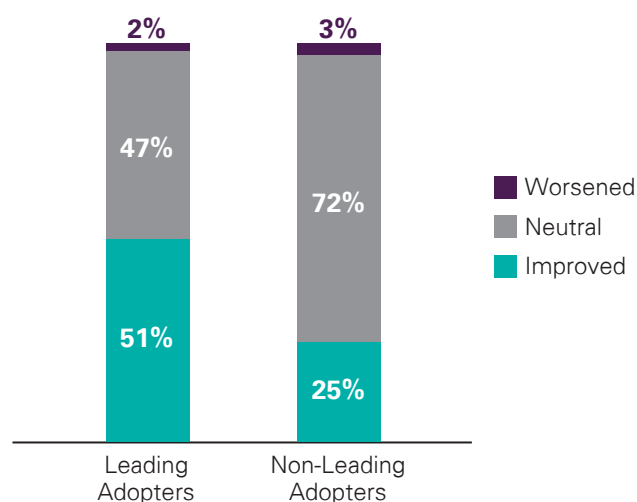
Similarly, when looking at banks' views on how effective Regtech has been in enhancing the quality of control and compliance within their organisation, more than twice as many Leading Adopters are positive about this in comparison with Non-Leading Adopters. This suggests that showing real case examples of improved quality of control and compliance may help to increase Regtech adoption.

Figure 5.20: Views on Regtech's ability to contribute to cost and operational efficiency in the past 12 months and effectiveness in enhancing the quality of control and compliance

How effective has Regtech been in enhancing the quality of control and compliance within your organisation



How has Regtech adoption contributed to cost and operational efficiency in the past 12 months

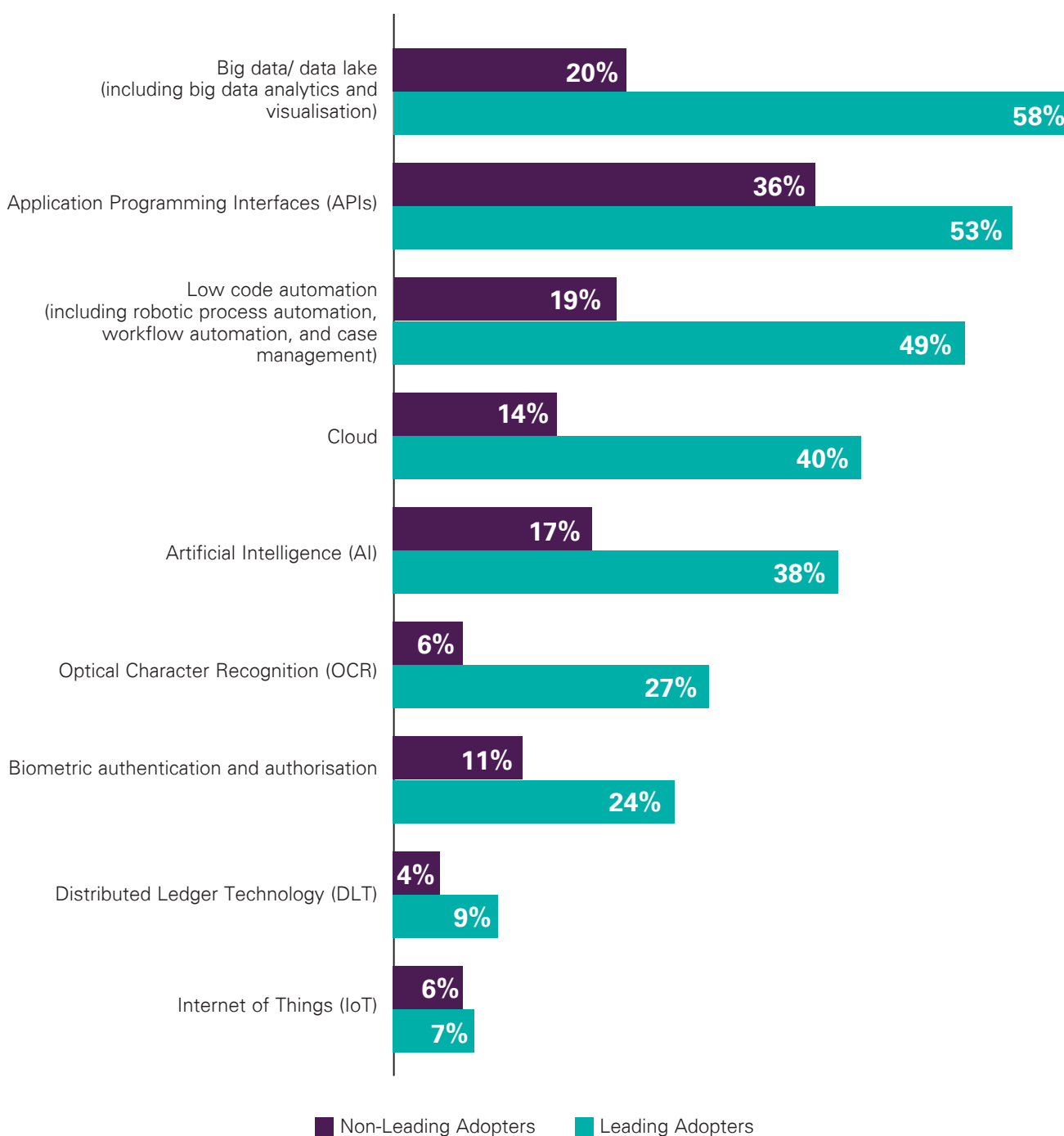


Source: The HKMA and KPMG, Data collection on Regtech adoption in the Hong Kong banking sector 2020

Regtech is underpinned and enabled by a number of prominent emerging and established technologies. These vary from more established technologies such as cloud to more emerging areas of Natural Language Processing (NLP) and the Internet of Things (IoT). As Figure 5.21 indicates, the Leading Adopters are much more likely than Non-Leading Adopters to employ both established and emerging technologies within their organisations. More Leading Adopters utilise key underpinning technologies such as cloud and Application Programming Interfaces (APIs) than Non-Leading Adopters. The use of big data is also far more prevalent among Leading Adopters than

Non-Leading Adopters. A similar picture emerges for those trialling and using emerging technologies such as Artificial Intelligence (AI), Optical Character Recognition (OCR), Biometrics, and Distributed Ledger Technology (DLT), and this could be one of the factors contributing to more Leading Adopters realising improved efficiency (Figure 5.20) when compared to Non-Leading Adopters. The relatively lower use of cloud compared to the other technologies is more likely due to banks needing time to work through how cloud adoption complies with their internal policies, processes, and risk practices, than a lack of willingness to adopt cloud in the future.

Figure 5.21: Technology use by banks for Regtech



What about the impact on the Hong Kong banking industry?

As discussed in the white paper, Regtech can bring benefits to customers, banks, and regulators. Through the RAI, a detailed picture also emerges of banks' views on the benefits that Regtech can bring to the Hong Kong banking industry. Figure 4.5 provides an overview of these benefits from the banks' perspective, and they can be grouped into four broad themes.

Cost and control

Firstly, banks mention the benefits of better quality and control combined with reduced costs and improved efficiency. These are the two foremost benefits as they can bring real improvements to the bottom line and profitability for banks. Enhancement of quality and control is cited as a top benefit (80%) (Figure 4.5), followed by reducing costs and improving efficiency (71%).

Hong Kong ecosystem

Several benefits for Hong Kong are mentioned, including strengthening Hong Kong's status as a international financial centre, promoting Hong Kong as an innovation and development hub for Regtech, improving collaboration between banks and regulators, and attracting global talent and solution providers.

Customers

The third facet of perceived benefits is that banks see Regtech improving the customer experience, aiding retention of customers, and even driving financial inclusion. It is positive to see that certain banks are looking at Regtech not only as a compliance-related technology but also as something that enables them to serve customers better and build trust in their brand. Virtual banks are good examples of organisations that leverage technology including Regtech to change the way that banks interact with their customers.



At livi we aim to provide customer-friendly and responsive services and minimise unnecessary hassle for customers for operational reasons. For example, with the availability of data analytics, we use data to complement customer income information instead of asking for documentary proof. This can help improve our customers' experience, while still allowing us to have the information that is needed.



livi Bank

Compete and innovate

Lastly, banks also see benefits in terms of enhancing competitiveness and their capabilities to innovate. Banks are, in general, positive about Regtech's potential contribution to product and service development. Reduced time to market of new service innovations can be a key additional outcome of implementing Regtech solutions. Key service differentiators, such as near-immediate account opening, would be hard to implement without the help of Regtech solutions.

In summary, the high Impact pillar score shows that the banking industry in Hong Kong has high expectations of Regtech and recognises the potential benefits of its application. Understanding the factors driving this score also helps to identify areas of action that banks and regulators could take to aid Regtech adoption.

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Looking forward

The previous section discussed the four pillars influencing Regtech adoption among Hong Kong's banks. It outlined how Regtech presents a great opportunity for banks to improve control and efficiency while lowering costs and improving margins. It is also evident that the Leading Adopters have witnessed real results and achieved significant benefits from using Regtech. There are considerable opportunities for Regtech adoption to grow further, both in breadth and depth, while several enablers for and barriers to growth have been identified.

Hong Kong has the right foundations in place to accelerate Regtech adoption, aided by the availability of broader fintech capabilities, strong support for technology businesses, a large financial sector, and supportive regulators.

Based on the RAI research conducted, several actions and focus areas for banks can be recommended. Many of these are in line with actions that the HKMA has already started to implement or is planning to implement, as the white paper has discussed. This final section lays out actions that banks can take to bring Regtech adoption forward, supported by the HKMA's initiatives.

6.1 Investment

Consider increasing total spend on Regtech

Regtech budgets, expressed as a percentage of total compliance budgets, are at relatively low levels. Banks should consider increasing their budgets as Regtech solutions are becoming more mature and cover a wider range of application areas. The Leading Adopters lens shows that banks at the forefront of Regtech adoption spend more on Regtech.

Separately, many banks already plan to increase the headcount applied to Regtech. To get the most from their resource commitments, banks should ensure there is enough support and opportunity for these roles through learning and development (see Section 6.3 Talent and Culture) and establish mechanisms to allow Regtech-focused employees to effectively share their knowledge across the organisation.

Actively participate in the Regtech ecosystem

As per the responses from banks, only 16% are currently taking part in Regtech-related associations and industry groups, and only 33% of banks are partnering with other Regtech firms, providers, or consortiums. Banks could be more active within the ecosystem and interact with Regtech solution providers and peer banks to learn through shared experiences and successful use cases.

Collaboration in the ecosystem is linked with higher adoption of Regtech by banks. The Leading Adopter lens illustrates how those that are ahead in Regtech adoption are more than three times as likely to participate in Regtech-related associations and groups. It also supports the other themes of recommendations well – banks will become more aware of Regtech benefits beyond the concept if they interact more with successful current users, Regtech solution providers, and peer banks who are already using Regtech at more advanced levels.

Likewise, for banks that already adopt Regtech to advanced levels, the ecosystem would be a great way to showcase their successes, collaborate with third parties, and contribute to industry level discussion on how solutions and regulatory processes should be transformed in the future.

Practical actions that banks could take include:

- Invite Regtech solution vendors to introduce their company's solutions and roadmaps. Solution vendors can also support this by engaging with banks and offering to introduce their services.
- Actively participate in sharing sessions organised by industry associations, for example the FinTech Association of Hong Kong (FTAHK)³, the HKMA (including the Fintech Supervisory Sandbox⁴ and Fintech Supervisory Chatroom to facilitate communication with the HKMA), and other stakeholders as they occasionally organise fintech and/ or Regtech-themed events.
- Enhance understanding of key technologies that support Regtech. Regtech solutions are available in many different sub-areas of risk management and compliance, and it is important for banks to understand the wide array of Regtech application areas (see Section 7, for an overview of the application areas) and the underlying technologies that enable the solutions.
- Understand what is available in the local market and further afield through vendor market research. This should go beyond “desk research” and should include active interaction with vendors as well as actively pursuing networking opportunities with new vendors.

The HKMA is supporting ecosystem engagement fully, with planned initiatives including the hosting of targeted



We have been actively involved in discussions with regulators and professional associations to develop Regtech. We have also participated in the Regtech Flywheel Series⁵, which provides us with regular insights into what is being done in the market and what is already being applied by peer banks.



BNP Paribas

events to boost Regtech awareness as well as sharing of experience in implementing Regtech through Regtech adoption practice guides. Subsidy schemes, such as the FSTB's Fintech Proof-of-Concept Subsidy Scheme, have

also been set up to encourage financial institutions to partner with technology firms to conduct fintech, including Regtech, proofs-of-concept.

³ The FinTech Association of Hong Kong is led by a volunteer group of board members and committee co-chairs who care about the future of fintech in Hong Kong, Greater China and Asia, (ftahk.org).

⁴ The Fintech Supervisory Sandbox, launched by the HKMA in September 2016, allows banks and their technology partners to conduct pilot trials of their fintech initiatives, (https://www.hkma.gov.hk/eng/key-functions/international-financial-centre/fintech/fintech-supervisory-sandbox-fss/).

⁵ RegTech flywheel is led by SC ventures, which is a business unit that provides the platform and catalyst for Standard Chartered to promote innovation, invest in disruptive financial technology and explore alternative business models, (https://scventures.io/2-years-of-rewiring-the-dna-in-banking/)

6.2 Adoption

Share successes to increase knowledge and buy-in

The RAI research shows that while many banks have started adopting Regtech, the depth of adoption is still at an early stage. 56% of banks use Regtech for at least two of the six identified regulatory themes, but only 28% of banks use Regtech for four or more. Based on banks' plans for the next 12 months, the breadth of adoption is more likely to grow than the depth of adoption.

The Leading Adopter lens suggests that those banks with higher adoption rates realise and see more benefits from using Regtech. During in-depth interviews with banks, it was also mentioned that being able to reference successful experiences with Regtech is important for leadership buy-in and securing budgets.

Practically, banks can enhance sharing of experiences and success stories across different departments to increase the breadth and depth of Regtech adoption. These should include discussions of the key business benefits, such as reduced cost, time saved, resources saved, and shortened lead time, to go beyond just the concept.

The HKMA is supporting more widespread adoption of Regtech by building the acceptance of key technologies that enable Regtech adoption and providing a clear way to measure and guide success in Regtech adoption by developing and publishing the RAI.

Ensure infrastructure and systems are ready for Regtech implementation

It became obvious that data, system, and infrastructure readiness is a challenge for many organisations, which could delay innovation and Regtech adoption. One-third of banks claim their set-up needs 'a lot of change' and 45% claim it needs 'some change' before they can adopt Regtech solutions. Leading Adopters are far more likely to have their systems ready, with only 11% of them claiming to require a lot of change, allowing them to implement Regtech faster.

Therefore, a key recommendation for banks is to upgrade current systems, infrastructure, and data platforms to allow for a faster transition to new technology and particularly to new Regtech solutions.



With our aspiration to become a truly data-driven organisation and to integrate data and analytics into the way we run our business, it is key that we build enterprise capability and industrialise artificial intelligence/ machine learning practices to scale up implementation of analytics use cases in the bank.



DBS

Develop and institutionalise a Regtech strategy

Less than a quarter of banks (24%) have a defined Regtech strategy with clear metrics and KPIs, and established policies and procedures in place to govern technology identification and implementation. Nearly twice as many Leading Adopters have such a strategy in place compared

to Non-Leading Adopters (36% versus 20%), which shows that a well-defined Regtech strategy is an important factor that is linked to higher Regtech adoption.

Banks should consider developing a Regtech strategy, which includes clear metrics and KPIs, as well as creating procedures around technology and solution provider identification and evaluation.

6.3 Talent and Culture

As discussed in previous sections, factors that correlate to higher levels of Regtech adoption include having a culture of innovation and support, having Regtech-focused employees and leadership, and committing to regular and structured Regtech training.

Develop a Regtech-focused training roadmap and structured curriculum

Analysis in this report indicates that internal Regtech training is still focused on general awareness, suggesting that banks have an opportunity to improve their employees' detailed understanding of Regtech application areas and benefits.



The thing that will hurt you the most is inertia. Inertia is not going to cut it today. There are so many external pressures. Extremely well-funded technology companies are out there looking to do things differently. It is imperative that the banks embrace the changes and put in place actions.



ComplyAdvantage

The HKMA supports this area and is developing a Regtech Skills Matrix to assess Regtech skills within banks in Hong Kong and Regtech providers. A report is to be published to highlight insights into the Regtech skills gap within the industry and relevant recommendations.

Establish leadership roles to advocate Regtech

Only one-third of banks currently have leadership roles championing Regtech. Leading Adopters are more than twice as likely as Non-Leading Adopters (56% versus 25%) to have Regtech leadership in place. Successful Regtech implementation requires the senior executives in banks to recognise the need for Regtech and then advocate it across the organisation.

6.4 Impact

The Impact pillar has the highest score across the four pillars of the RAI. It indicates that current expectations and confidence in Regtech are already at high levels compared to the other pillars. Relatively fewer actions can be mentioned in this area to help banks forward, but it is crucial for banks to understand what sets Leading Adopters apart from other banks in the Impact area, which describes the actual or perceived value that banks get from using Regtech.

Develop an approach to innovation to capture new Regtech use cases

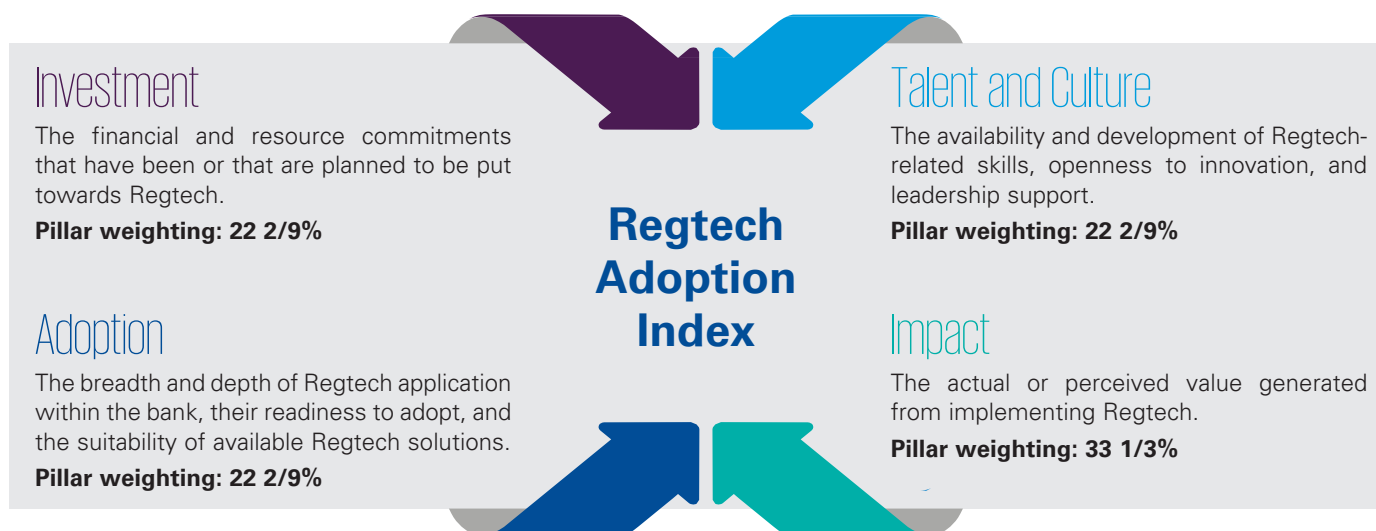
The general picture that this research shows is that while banks are positive about the potential benefits of Regtech in the future to their own organisations and the wider Hong Kong banking industry, they are less positive about actual contributions during the past 12 months to their own organisations. To counter this, banks should focus on developing an approach to innovation that continually assesses benefits and captures new Regtech use cases. This will help to prioritise those with the biggest impact and drive a culture of continuous improvement. The Leading Adopters show they are positive about Regtech's future as well as past contributions to their own organisations.

Banks that implement Regtech in a wider set of application areas are also more likely than others to experience benefits in terms of cost and operational benefits, which serves as a clear message to banks that are not yet implementing Regtech or just started.

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Appendix: a detailed overview of Regtech Adoption Index and its components

Figure 7.1: Overview of Regtech Adoption Index and its four pillars



Investment

The financial and resource commitments that have been or that are planned to be put towards Regtech. It includes capital investment and headcount allocation as well as other investment relating to the Regtech ecosystem such as partnerships, collaborations, and involvement in industry associations. Investment in Regtech and innovation in general reflects a bank's intent to implement and derive value from Regtech. The indicators under Investment include:

- Current and future (next 12 months) budget and resource allocation
 - For budget-related measures, only budgets covering Hong Kong are included.
 - For headcount-related measures, only people/ roles covering Hong Kong are included, whether they reside in Hong Kong or not.
- Partnerships and collaborations with Regtech firms, solution providers, or consortiums.
- Involvement in Regtech-related associations, forums, or consortiums.
- Whether a technology or innovation hub exists within the bank and the extent to which it is dedicated to Regtech.
- Banks' views on investments in Regtech by other businesses and the government.

Adoption

While the Investment pillar looks at financial and resource commitments being put towards Regtech, the Adoption pillar is focused on the application of Regtech as well as the systems and structures in place to support its application. The pillar covers the breadth and depth of Regtech application within banks, their readiness to adopt Regtech in terms of strategy, governance, systems, infrastructure, and data, the suitability of available Regtech solutions, and the sufficiency of external guidance. The actual adoption of Regtech, where organisations have not only expressed an interest but have implemented Regtech solutions, indicates greater maturity. The suitability of solutions and guidance provided by the government and government agencies are also considered as key enablers for more widespread adoption. Indicators under Adoption include:

- Readiness of infrastructure, systems, and data for Regtech adoption.

- Adoption of Regtech across six regulatory themes (Financial Crime, Risk Management, Conduct and Customer Protection, Regulatory and Tax Reporting, Regulatory Compliance Obligations, and Governance and Accountability), covering 26 specific application areas.
- Depth of Regtech adoption in each of the six regulatory themes.
- Future plans (next 12 months) to increase adoption in each of the six regulatory themes (both breadth and depth).
- Strategy and governance, covering whether a Regtech strategy has been established with clear metrics, KPIs, and policies to govern Regtech.
- Banks' views on whether guidance and support from regulators and industry associations are sufficient.
- The suitability of Regtech solutions available in the market.

Talent and Culture

This pillar covers the availability and development of Regtech-related skills, openness to innovation, and leadership support. Having access to Regtech talent and the ability to develop Regtech knowledge and capabilities are essential for adoption. A culture and leadership that embrace innovation and new ways of working indicate the organisation's willingness and readiness to experiment with new technologies such as Regtech. Indicators under Talent and Culture include:

- Whether banks have access to Regtech talent, either locally, regionally, or globally.
- Whether banks actively conduct or sponsor Regtech-related learning and development and the amount they conduct or sponsor (current and next 12 months).
- Presence of clearly defined learning paths for Regtech-related careers.
- Openness to trialling new and emerging technology.
- Whether they have leadership championing and driving Regtech.
- Banks' views on the technological advancement and level of innovation in Hong Kong.

Impact

The actual or perceived value generated from implementing Regtech. It includes the effectiveness of Regtech in enhancing the quality of control and compliance, the contribution of Regtech to cost and operational efficiency, and its ability to benefit the Hong Kong banking sector. If the impact of Regtech is perceived to be positive, organisations are more likely to start or continue to adopt Regtech. The indicators in the Impact pillar are:

- Degree to which Regtech can enhance the quality of control and compliance within the organisation.
- Whether Regtech adoption contributed to real cost and operational efficiency in the past 12 months.
- Regtech's overall ability to positively contribute to the organisation in the future (12 months).
- Regtech's contribution to the Hong Kong banking industry.

Regtech definition used in data collection template

Regtech is a sub-set of fintech that focuses on technologies that facilitate the delivery of regulatory requirements or risk management outcomes more efficiently and effectively.

Weighting across pillars

The pillar weightings were determined based on input from respondents to the data collection, calibration through the in-depth interviews, and validation with Regtech stakeholders within the HKMA and KPMG. The Impact pillar has a weight of 33 1/3 %, while the remaining three pillars make up the rest, with each weighted at 22 2/9 %.

Regtech application areas

26 specific Regtech application areas were identified for the purpose of the white paper and RAI. There are many exciting new use cases being investigated daily, to the extent that generating a comprehensive list is challenging. The 26 application areas, spread across six regulatory themes (Figure 7.2), outline the more prominent examples seen in the banking industry today.

Figure 7.2: Overview of Regtech application areas



- 1 Regulatory Compliance Obligations:** The set of actions taken to identify and comply with applicable laws, regulations, and other relevant standards.

Application areas: maintaining an inventory of all internal and external compliance obligations (i.e. GRC), cross-border regulatory compliance, regulatory horizon scanning, and operational resilience from regulatory change.

- 2 Financial Crime:** The measures undertaken by the institutions to prevent any non-violent offence that will result in a financial loss.

Application areas: customer on-boarding, name screening, AML transaction monitoring, ongoing monitoring of customers (e.g. fraud, credit), and customer off-boarding.

- 3 Conduct and Customer Protection:** The measures undertaken by an institution to safeguard the interests of its customers and uphold market integrity through appropriate checks and balances and conduct risk management.

Application areas: sales practices and suitability, product due diligence, product disclosure, best execution/ pricing, customer data and privacy, and monitoring and surveillance of employees (e.g. fraud).

- 4 Regulatory and Tax Reporting:** The process of reporting tax and compliance obligations to evaluate an institution's operations, its overall health, and the status of compliance.

Application areas: regulatory reporting, CRS/ FATCA, and tax compliance.

- 5 Risk Management:** The framework in place to identify, assess, measure, monitor, and mitigate risks that could impact an institution's profitability, liquidity, or solvency.

Application areas: cyber risk, third-party monitoring and risk management, liquidity risk management, market risk management, credit risk assessment, stress testing, and model validation.

- 6 Governance and Accountability:** the structure of rules, practices, processes, and responsibilities within an organisation.

Application areas: The use of Regtech solutions to transform traditional governance and accountability frameworks from reactive to proactive.