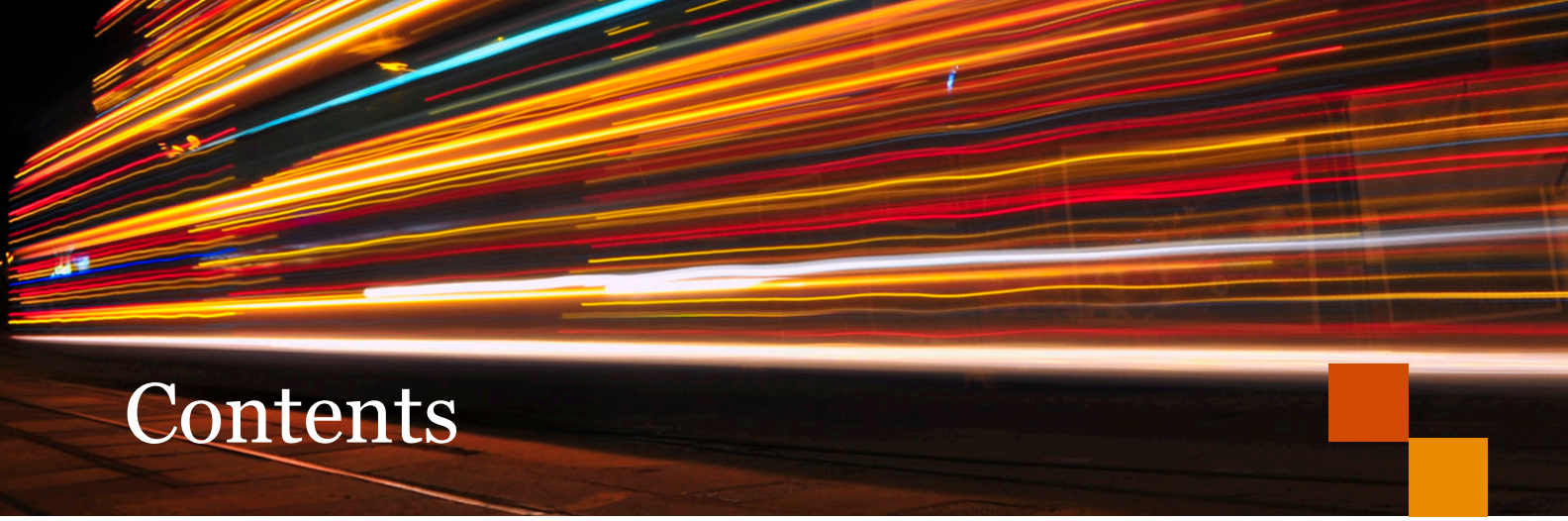
pwc

SFA SINGAPORE FINTECH ASSOCIATION

FinTech's state of play 2.0

Taking stock of Singapore's FinTech landscape, 2024



Contents

Foreword

FinTechs have endured significant headwinds in the past two years, contributed by the tightening of global monetary policies and geopolitical tensions. However, these challenges have not stopped their momentum.

Back at home in Singapore, I am encouraged by the resiliency and agility of our FinTech sector. Through our survey, which received more than 160 responses from FinTechs with a presence in Singapore, 78% of the respondents recalibrated their business models in the past three years. This included pivoting into a more sustainable approach to the market and introducing new products or services through internal development or inorganic expansion. There was also a series of mergers and acquisitions.

As a result, the industry is moving towards more sustainable growth. 46% of those working towards profitability have projected breakeven in the next 12 months. We further noted a growing proportion of FinTechs generating over SGD100m annual revenue.

I am confident that, with their tenacity and flexibility, FinTechs in Singapore will continue to thrive and succeed.

Wanyi Wong
FinTech Leader
PwC Singapore

Singapore's FinTech sector has once again demonstrated its ability to adapt and thrive in a period marked by rapid technological advancements and evolving market dynamics. The increasing adoption of AI, blockchain, and quantum computing signals not just a trend but a fundamental shift in how FinTechs are reimagining their offerings and their role in the global economy.

What stands out for me is the strategic shift towards deepening expertise in niche areas. From sustainable finance to cross-border payments, Singapore's FinTechs are expanding their reach beyond traditional sectors, cementing the nation's position as a hub of innovation. Our survey results show that 43% of respondents have prioritised emerging technologies, ensuring their competitiveness in an increasingly digital world.

Looking ahead, I believe the next phase of growth will require not just technological adoption but a renewed focus on talent, collaboration, and resilience. As Singapore continues to attract global players and foster local innovation, I am optimistic about our collective ability to build a future-ready FinTech ecosystem that leads unites the ecosystem not just in ASEAN, but on the global stage.

Shadab Taiyabi
President
Singapore FinTech Association

Executive summary

Act 1: FinTech state of play

In 2022, we took stock of the state of Singapore's FinTech ecosystem. At that time, the industry was experiencing rapid growth fuelled by high levels of funding and catalysing effect of the Covid-19 pandemic. In hindsight, funding was at its peak for the past five years.

Today, we are taking another snapshot of the Singapore FinTech landscape. As part of our study, we conducted a survey to which over 160 FinTech firms in Singapore responded.

The average age of FinTech companies is 5.5 years, demonstrating a maturity in a nascent industry. While the Singapore FinTech industry continues to expand, sub-sectors are growing at different paces. In the past two years, the number of Web3 companies grew the most whereas the number of lending companies experienced the sharpest drop in growth rate. It is likely that the number of FinTech companies may plateau in the near future. However, existing FinTech companies will expand in size as a result of organic and inorganic growth. We have already observed that in the most mature sector i.e. the Payments sector.

Based on the FinTech's state of play 2.0 survey results, the top three sectors of FinTech by count of companies are:

Payments | **Web3** | **RegTech**

55%

Proportion of Singapore FinTech companies which are providing solutions in the Payments, Web3 and RegTech space.

5.5 years

Average age of Singapore FinTech companies. Payment companies are more mature compared to the other respondents.

Act 2: Evolution of growth in FinTech

2.1 The number of Web3, InsurTech and ESGTech companies continues to grow while other sectors expand at a relatively slower pace

While the payments sector remains the biggest component of the FinTech ecosystem, the count of Web3 companies has grown significantly from just 5% of the Singapore FinTech ecosystem in 2022 to 16% in 2024. The growth can be attributed to Singapore's regulatory clarity as the Monetary Authority of Singapore (MAS) continues to roll out robust regulatory framework for activities relating to digital payment tokens.

Growth was also observed in the number of InsurTechs and ESGTechs*. Insurance is a space ripe for digital disruption and innovation that has been emerging in this space, slowly but surely. In addition to this, ESGTech is a space that has welcomed many entrants as attention and resources are directed into this space. This is further supported by incentives offered by the government and agencies.

*FinTech providing solutions in Environmental, Social and Governance (ESG) space.

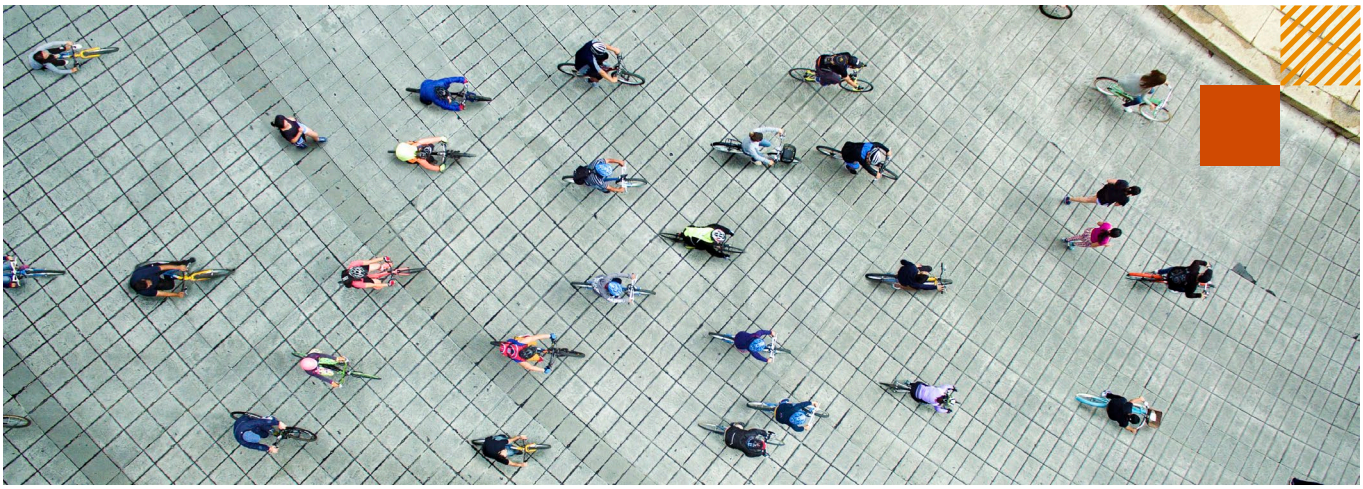
Recalibration of business models

78% introduced new products and services or changed the target business model in the past three years.

2.2 Maturity of the FinTech industry

Funding data[1] showed that investments into FinTechs declined in 2023 and 2024. However, deal activities picked up in the form of mergers and acquisitions. Many of these deals were in the payments space, the largest sector in the FinTech industry. This industry consolidation represents a natural phase in its life cycle.

Following the high-growth period of the past five years, we observed a shift in priorities. Firms are working towards profitability through cost efficiency and sustainable pricing; focusing on existing markets; and enhancing product offerings and service efficiency through acquisitions. For example, some FinTechs pivoted their business model to be heavier on the B2B front.



[1]Fintech Funding in Asia Hit 6-Year Low As Mega Deals Decline, 2024, Fintech News Singapore

Act 3: Looking to the future

The FinTech market continuously re-invents itself to meet the ever-changing needs and expectations of geopolitical events and economic resets, with digital payments, artificial intelligence (AI), digital assets, and, further into the future, quantum computing, emerging as some of the most significant trends. The Singapore government has been proactive and reactive to the changing environment and customer needs. The **National AI Strategy (NAIS 2.0)** introduced by the Singapore government aims to realise the benefits of AI and create new exciting opportunities. About 80% of the survey respondents are bullish about the growth of the FinTech market in Singapore.

Where AI is making its mark, Quantum computing is pushing the boundaries of technological limits – including the development of quantum-resistant encryption standards and enhancing AI's analytical prowess with its superior computing power.

We explored the trends in the adoption of AI and quantum computing in the section "innovation trends".

Positive outlook

80% feels positive about the new opportunity and growth in FinTech space.

Prioritisation of new technology

43% acknowledge the need to prioritise the adoption of AI, blockchain, and other emerging technologies in the near future.

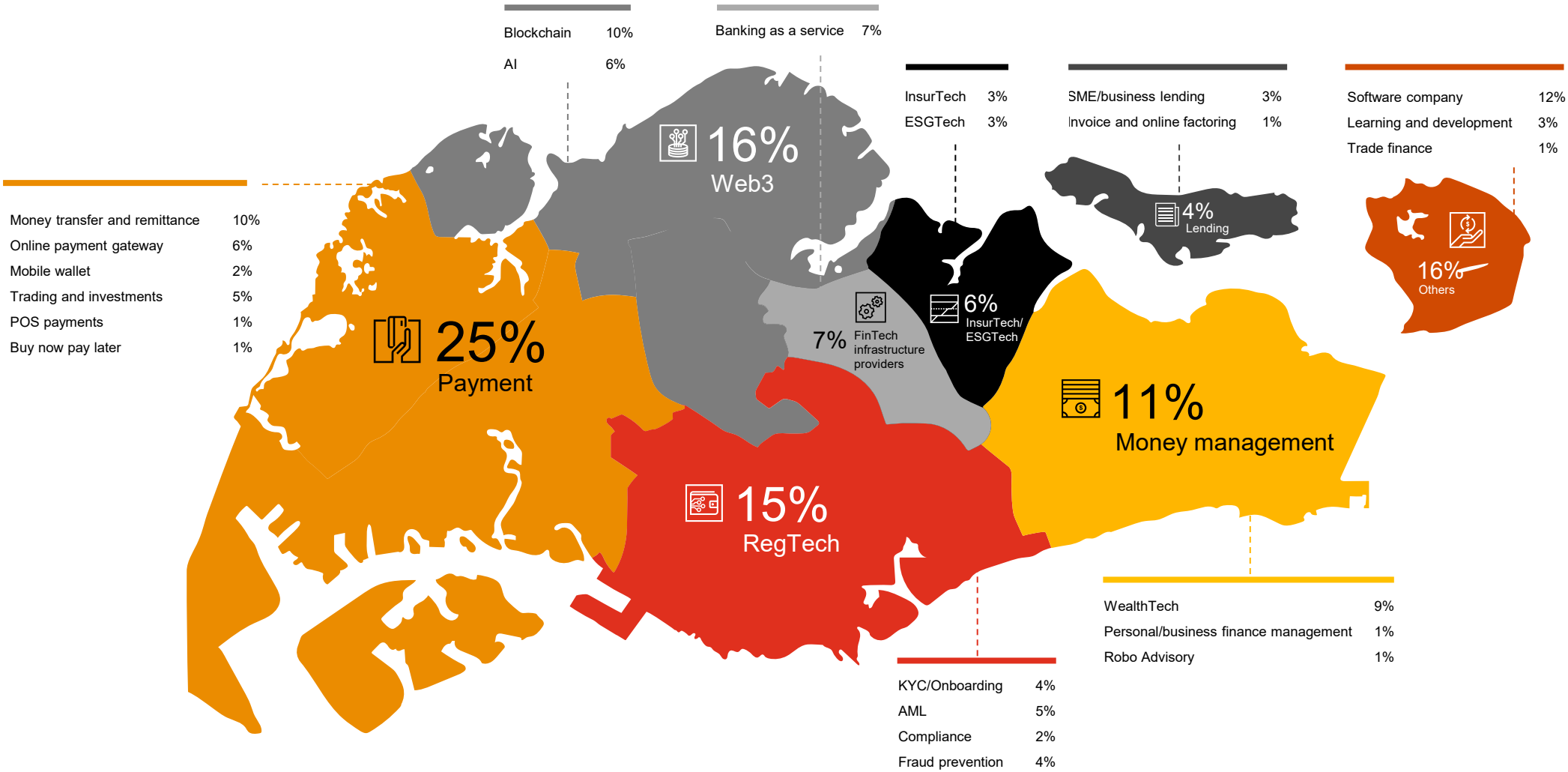
Singapore Government Initiatives

3 billion Singapore dollars commitment by Singapore government to invest in strengthening AI and finance[2]

[2]Singapore Budget 2024: Initiatives and support measures to help businesses thrive, 2024, EDB Singapore

Act 1: FinTechs' state of play

In 2022, we took stock of the state of the Singapore's FinTech ecosystem. Today, we are presenting another snapshot of the Singapore FinTech landscape. The landscape is created based on the results of our survey to which over 160 FinTech firms in Singapore responded:



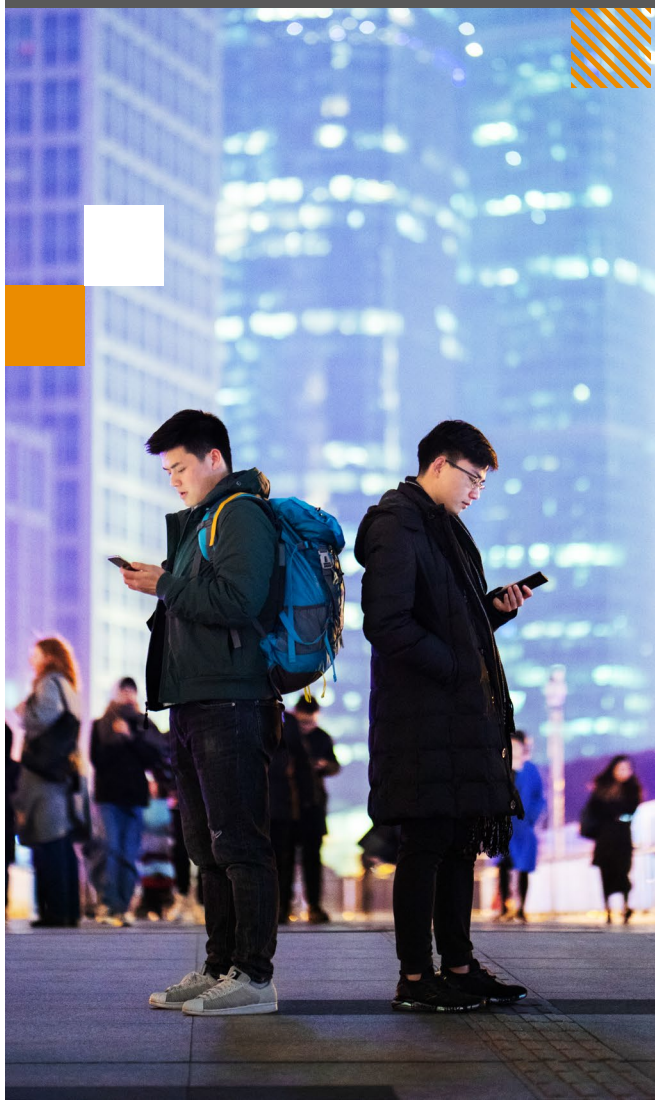
Act 1: Fintech State of Play

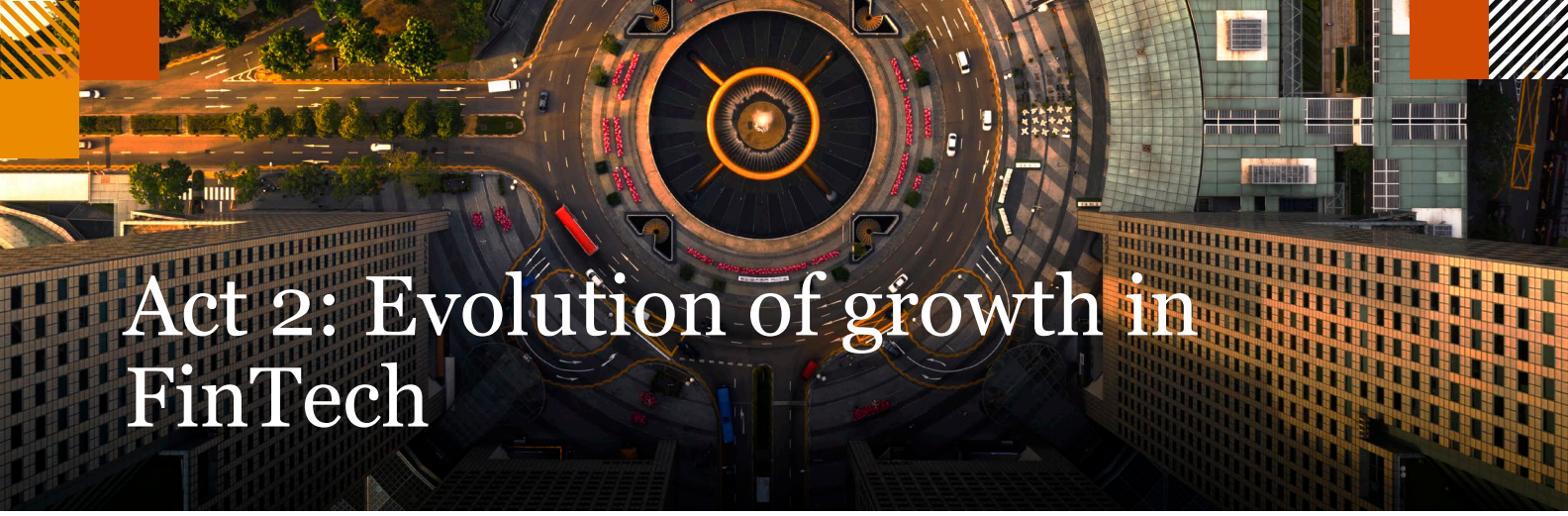
Singapore's FinTech journey exemplifies a nation poised at the forefront of financial innovation. Singapore's progressive ecosystem, dedication to cutting-edge technologies, and emphasis on digitalisation paint a vivid picture of a future in the FinTech industry. There is an estimate of 900 FinTech companies in Singapore providing a diversified range of products.

We saw the growth of new FinTech companies in Singapore pick up since the establishment of the MAS' FinTech Technology and Innovation Group in 2015. The average age of FinTechs in Singapore today is 5.5 years old.

Based on our survey, FinTech companies in Singapore have an average age of

5.5 years





Act 2: Evolution of growth in FinTech

Number of Web3, InsurTech and ESGTech companies continues to grow while other sectors expand at a slower pace

While payments sector remains the biggest component of the FinTech ecosystem, the count of Web3 companies has grown significantly from just 5% of the Singapore FinTech ecosystem in 2022 to 16% in 2024.

Growth was also observed in the number of InsurTech and ESGTech companies. Insurance is a space ripe for digital disruption and innovation has been emerging in this space, slowly but surely. In addition to this, ESGTech is a space that welcomed many entrants as attention and resources are directed into this space. This is further supported by incentives offered by the government and agencies.

Regulatory clarity acting as a catalyst for Web3 sector

The growth can be attributed to Singapore's regulatory regime as MAS continues to roll out a robust regulatory framework for activities relating to digital payment tokens. In general, the industry, including Ms. Sharon Lourdes, Co-Founder and CEO of Headquarters (HQ.xyz), appreciates Singapore's proactive and forward-thinking regulatory stance - in particular, the Payment Services Act related to Digital Payment Tokens and stablecoins. Such a regulatory climate not only sets a solid foundation but actively promotes innovation and adoption within the Web3 sector. With the recent roll-out of various consultation papers and regulations, we note a shift towards stablecoin issuances and institutional use of blockchain.

The Payment Services Act was passed in 2019 covering digital payment tokens (DPTs) as one of its activities. More recently, the regulation in relation to DPTs has expanded to include custodial services for DPTs, and facilitation of transmission and exchange of DPTs. The unique regulatory clarity has shown to be attractive to Web3 businesses[4].

Changing customers' needs encourage growth in the InsurTech sector

Insurance is a space ripe for digital disruption and innovation has been emerging in this space, slowly but surely. The Singapore Insurtech market size in terms of investment value is expected to grow from USD142.07m in 2024 to USD225.08m by 2029, at a CAGR of 9.64% during the forecast period (2024-2029)[3]. We have also seen significant deals and activities, notably Sumitomo Life's acquisition of Singapore Life (Singlife) and Bolttech's Series B funding round in 2023.

Disclosure and reporting requirements attract ESGTech solutions

Given the increased disclosure requirements in the ESGTech space where listed companies in Singapore will lead the way in 2025 by adopting and implementing the requirements of IFRS Sustainability Disclosure Standard issued by the International Sustainability Standards Board (ISSB), followed by large non-listed companies in 2027, there is a need for technology and innovative solutions to overcome data quality issues and to assist in creating transparent and consistent reports. As such, many entered the ESGTech sector promising solutions that provide accurate and accessible data. This space is further supported by incentives offered by the government and agencies. The MAS committed SGD2.38bn to climate portfolio and rolled out the gprnt.ai (Greenprint) platform[5]. All of these have jumpstarted the ecosystem for a very active ESGTech landscape.

[3]InsurTech Market in Singapore Size & Share Analysis - Growth Trends & Forecasts (2024 - 2029), Mordor Intelligence
[4]MAS expands scope of regulated payment services, amends ongoing compliance requirements and introduces user protection requirements for DPT service providers under Payment Services Act, 2019, 2024, Allen & Gledhill
[5]MAS to deploy $2.38 billion to five asset managers for climate-related investments, 2021, The Straits Times

Act 2: Evolution of growth in FinTech

While investments into FinTechs declined in 2023 and 2024, deal activities picked up in the form of mergers and acquisitions. Many of these deals were in the payments space, the largest and most mature sector in the FinTech industry. This industry consolidation represents a natural phase in its life cycle.

Consolidation and redefined focus into existing markets and products.

Players continue to fortify their product offerings, geographical reach and market share by coming together. Transactions were generally to expand the existing product suite and to enter into new markets in a swifter manner.

Ant Group acquired **2C2P** to accelerate digital payment adoption and innovation.

Matchmove acquired e-commerce specialist **Shopmatic**.

Funding Societies acquired payment solution **CardUp**.

Thunes acquired anti-money laundering and compliance technology company **Tookitaki**.

FOMO acquired **CapBridge**, a capital markets service and asset custody firm and **1exchange**, a private securities exchange company.

[6]HSBC launches US$1billion ASEAN growth fund, 2024, The Business Times
[7]OCBC to launch programme to accelerate growth of women-owned SMEs, 2024, The Business Times
[8]Digital asset payment gets boost with Visa-dtcpay tie-up on cryptocurrency transactions, 2024, The Straits Times
[9]Singapore-headquartered AI Credit Scoring fintech FinbotsAI to transform credit risk management for Myanmar's largest privately-owned bank, KBZ Bank, 2024, Asiaone

78%

of the respondents recalibrated their business models either to introduce new products or to capture new business opportunities.

The FinTech industry has experienced sustained growth, and traditional institutions have recognised the importance of investing in innovative solutions. HSBC has launched a USD 1 billion ASEAN Growth Fund to enhance the capabilities of the digital companies[6]. OCBC has launched the OCBC Women Entrepreneur Programme, to back startups led by women entrepreneurs[7]. Visa has partnered with dtcpay to transform the digital payments landscape in Singapore[8], and Myanmar's KBZ Bank has partnered with Singapore's FinbotsAI for credit scoring using AI[9]. All of these offerings highlight how traditional banks are trying to explore the opportunities lying in the FinTech space.

Nium acquired **Ixaris**, London-based travel payments player and **SoCash,** an alternative payment network platform

M-DAQ acquired **Wallex**, a B2B cross-border payments provider.

Payoneer acquired **Skuad**, Singapore based workforce and payroll management company.

Western Union acquired **Dash** mobile wallet from SingTel.

Singapore – A hub for FinTech Unicorns

Notwithstanding the recent funding winter and recalibration of business models, Singapore continues to be home to many iconic FinTech unicorns*.

In our FinTech in ASEAN report[10], co-authored with Singapore FinTech Association (SFA) and United Overseas Bank (UOB), Singapore FinTechs consistently attracted the biggest share of funding in the region** despite the prevailing geopolitical tension, high interest environment and economic worries. By funding amounts or deal counts, Singapore commands around 50% of the transactions in the region.

Singapore has been an appealing destination for investments due to its world class infrastructure, proactive regulatory support and strong trade links with its neighbouring countries.

With the support of the funding, 16% cite having a valuation of more than SGD100m, where Payment sector leads the list.

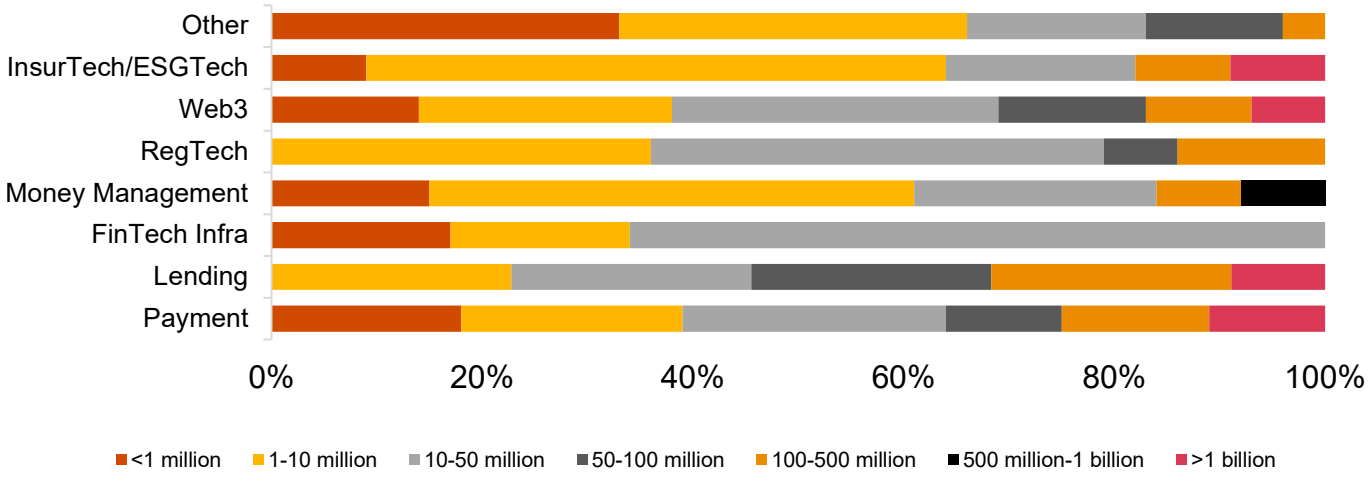
16%

of the survey respondents have a valuation of more than SGD100m, where Payment sub-sector lead the list.

Our unicorns include[11]:

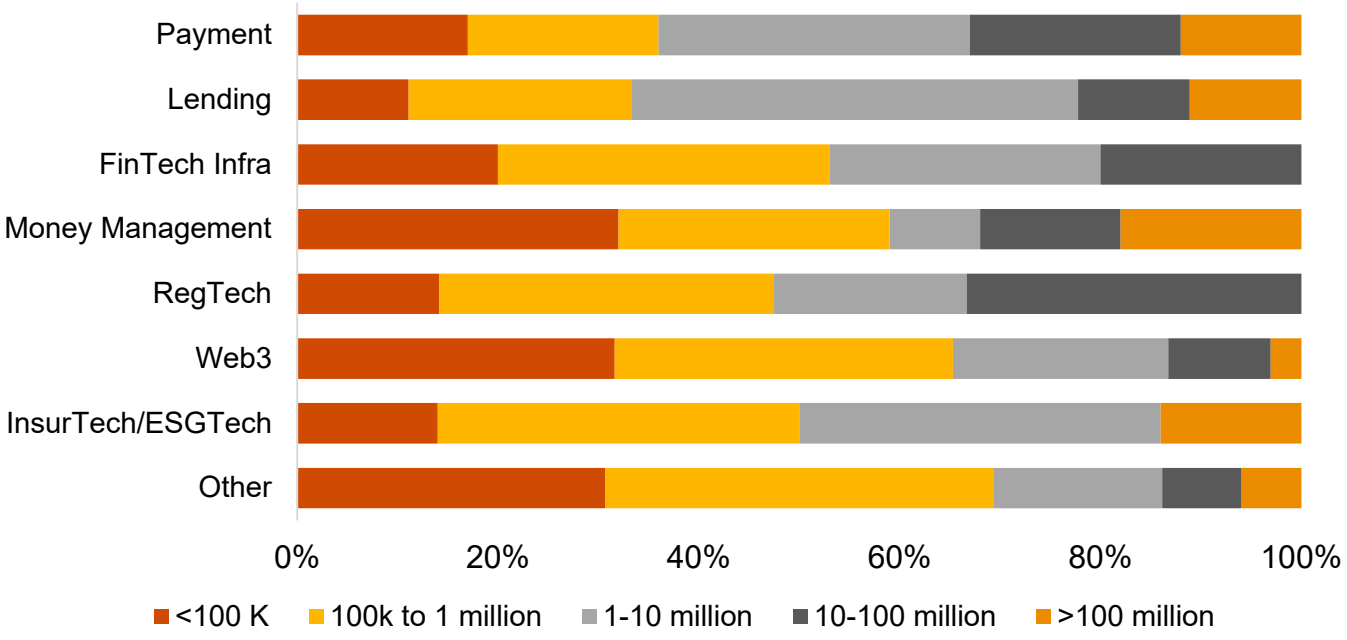
Airwallex - Global Payments and financial platform
bolttech - International InsurTech
Coda - Channel, platform and payment solutions for digital content
Nium – Global infrastructure for on-demand money movement
Singlife - Technology-empowered insurance

Current valuation (SGD)



*Unicorn being a privately held company with a current valuation of US$1 billion or more.
**Region being ASEAN's six biggest economies: Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam (ASEAN-6)
[10]FinTech in ASEAN 2023: Seeding the Green Transition, UOB, PwC and SFA
[11]List of 28 unicorn startups in Singapore, 2024,Tracxn

Annual turnover (SGD)



Strategic shift by FinTech players

Following the high-growth period of the past five years, we observed a shift in priorities. Firms are working towards profitability through cost efficiency and sustainable pricing; doubling down on existing markets; and enhancing product offerings and service efficiency through acquisitions. For example, some FinTechs pivoted their business model to be heavier on the B2B front. This is similarly observed by Mr. Chuang Shin Wee, Co-Founder and CEO of Pand.ai. He noted that a B2C company has to engage in extensive marketing which then would be a function of money. This became tougher in the past two years with the tightening of funding levels. In addition, Singapore has a limited consumer market, but the regional markets are quite fragmented.

As a result, the industry is working towards sustainable growth in revenue and steadily closing the gap to breakeven.

About 12% and 18% of the respondents in the payment and money management sub-sectors respectively reported revenues of more than 100m. For those who are working towards profitability, 46% of them are optimistic about breaking even in the coming year.

Of those working towards profitability,

46%

expects to breakeven within 12 months.

59%

of all respondents are in B2B.

Act 3: Looking to the future

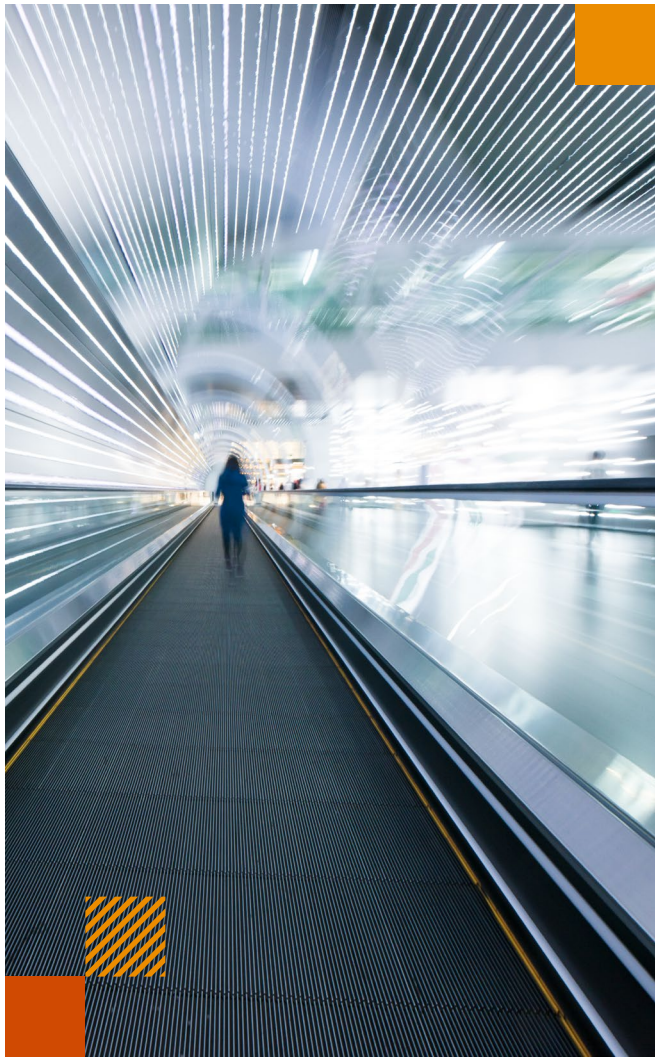
The FinTech market continuously re-invents itself to meet the ever-changing needs and expectations of geopolitical events and economic resets with digital payments, artificial intelligence (AI), digital assets, and, further into the future, quantum computing, emerging as some of the most significant trends.

Adoption of emerging technology as key

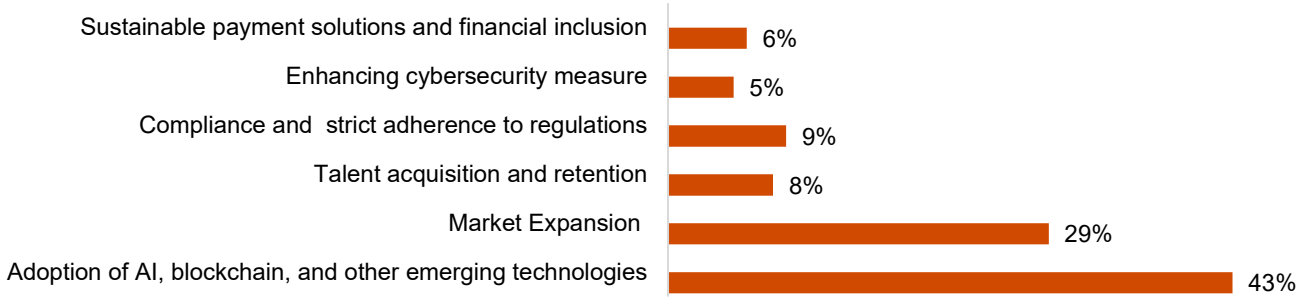
Survey respondents told us that emerging technology adoption has become the dominant priority for fintech firms. 43% of them placed AI adoption, blockchain and other emerging technologies as their main priority. This is driven by the promises of enhanced efficiency of operations, as well as the need to maintain profit margins in a highly competitive environment.

Market expansion through offering new products and entering into new market stands as the next priority for 29% of survey respondents.

Sustainable payment solutions (that involve moving towards the use of green technologies such as biodegradable cards and digital wallet solutions) and financial inclusion, as well as talent acquisition and retention jointly compromise the priority for 14% of the respondents. This is driven by the firm's need to constantly maintain their competitive advantage over both peers and the established financial institution players.



Priorities of FinTech firms



Innovation trends

Artificial Intelligence (AI) in FinTech

AI and FinTech – Collaborators, not competitors

AI has stolen the spotlight in various industries in recent years, including in financial services. However, AI is not just a place for investors to pump money into, it is a product that FinTechs can use to streamline their operations. Organisations are increasingly leveraging AI-powered tools to streamline processes, analyse data, and deliver personalized experiences to their customers.

Banking institutions remodel a part of their businesses to adapt to the changes caused by the digitalisation revolution. They are working with FinTech firms that can maximise the value from the use of such AI tools.

Potential of AI

Data-driven AI applications for lending decisions

Applications embedded in end-user devices, personal robots, and financial institution servers are capable of analysing a huge volume of data, providing customised financial advice, calculations and forecasts.

Reinventing the customer service experience

As speech processing and natural language processing technologies mature, we are drawing closer to the day, when computers will handle most customer service queries. This would mark an end to waiting in line and result in happier customers.

The value and use of AI is not just limited to the above benefits. It is much more than one can even imagine.

Singapore government – Pillar of innovation

In 2023, Singapore launched the second **National AI Strategy (NAIS 2.0)**[12] which represents Singapore's commitment to realise the benefits of AI and create exciting new opportunities. It outlines the government's vision for Singapore to be a place where AI serves as a force for good, harnessing AI to uplift and empower our people and businesses.

According to the **Singapore Budget 2024**, the Singapore government is investing SGD 1 billion to accelerate AI development and adoption in the next five years. Up to SGD 500m will go towards strengthening AI infrastructure to support the wave of AI adoption[13].

According to the media release on 18 July 2024, MAS will enhance the existing AI and data grant scheme under **FSTI 3.0** by committing up to SGD100m to support quantum and artificial intelligence capabilities in the financial sector[14].

Challenges of AI

A lot of sensitive data to process

Financial information is just as sensitive as one's medical history or personal life. This means one has to keep their algorithms secure by design and pay extra attention to hacker-proofing the processes and databases.

Threat of human replacement

Currently robots with using AI are coming for jobs which is a concern for unemployment.

Compliance

The FinTech industry is thoroughly regulated. This means putting extra effort into compliance with local, federal, and, possibly, international law. Companies will have to ensure close cooperation between their technical and legal teams to minimise future regulatory risks.

[12]National Artificial Intelligence Strategy 2.0 to Uplift Singapore's Social and Economic Potential, 2023, Smart Nation Singapore
[13]Singapore Budget 2024: Initiatives and support measures to help businesses thrive, EDB Singapore
[14]MAS commits S$100 million to support quantum, AI capabilities in financial sector, 2024, The Business Times

What can be enhanced, replaced and will remain unaffected with introduction of AI?

Enhanced

User experience: With AI, Fintechs can offer more customised and nuanced financial products and services tailored to the needs of the individual.

Efficiency of work: AI can scan vast amounts of data in real-time to identify patterns or anomalies that might indicate potential risks. This will also help to save time and cost involved.

Replaced

Manual processes: Operational processes like invoice processing, payment reconciliation, and account management can be automated, freeing up human resources to focus on more complex and value-added activities.

Unaffected

Decision making: Fully autonomous decision making. Human input is still needed to avoid biases and ensure fairness in its decision making. Governance and oversight are still needed to manage AI. Finance is not merely about numbers and calculations; it is also about understanding human behaviour, managing risk, and making strategic decisions.

Relationship building: AI lacks the emotional intelligence to build lasting relationships with clients. AI cannot replicate the art of negotiation, the ability to build trust, and the nuanced judgment required in complex transactions.

Positive outlook powered by emerging technologies

43% of the **FinTech state of play 2.0 survey** responses states that their company is prioritising to adopt AI technology in the next 3 to 5 years.

25% of the 4,702 executives surveyed in **PwC's 27th Annual Global CEO** Survey intend to decrease their workforce by 5% or more in 2024, attributing this decision to generative AI[15].

69% of senior executives in **PwC's 2024 Global Digital Trust Insights survey** will use GenAI for cyber defence in the next 12 months[16]. Platforms are licensing their large language models in tandem with their cyber tech solutions.

Sharon Lourdes
Co-Founder and CEO of Headquarters

Headquarters (HQ.xyz) provides both the software (HQ Dashboard) to enable Web3 finance teams, as well as end-to-end services (HQ Concierge) for complete back office management.

> AI has significantly reduced the time needed to accomplish tasks across the board for our team —from engineering to marketing. This boost in productivity is invaluable for fast-paced industries such as Web3 and FinTech.

[15] PwC 27th Annual Global CEO Survey - Asia Pacific, 2024, PwC
[16] PwC 2024 Global Digital Trust Insight, 2024, PwC

Key initiatives released by Monetary Authority of Singapore (MAS)

The **Veritas Toolkit 2.0** was announced in 2023[17] to promote responsible and sustainable AI adoption in the financial sector. It includes an improved assessment methodology for fairness, ethics, accountability, and transparency from its previous version.

Project MindForge[18] was launched with the aim to develop a generative AI risk framework on the responsible use of GenAI in the financial industry, addressing common challenges and catalysing AI-powered innovation.

Use cases of AI in FinTech

Mr. Chuang from Pand.ai observes that in the near future, AI has the potential to revolutionise the FinTech industry with opportunities for companies to enhance productivity at a lower cost.

For example, Pand.ai develops AI chatbots that take over Human Resource functions ranging from handling leave applications, reviewing submitted claims, managing projects, generating reports, to tracking employees' training.

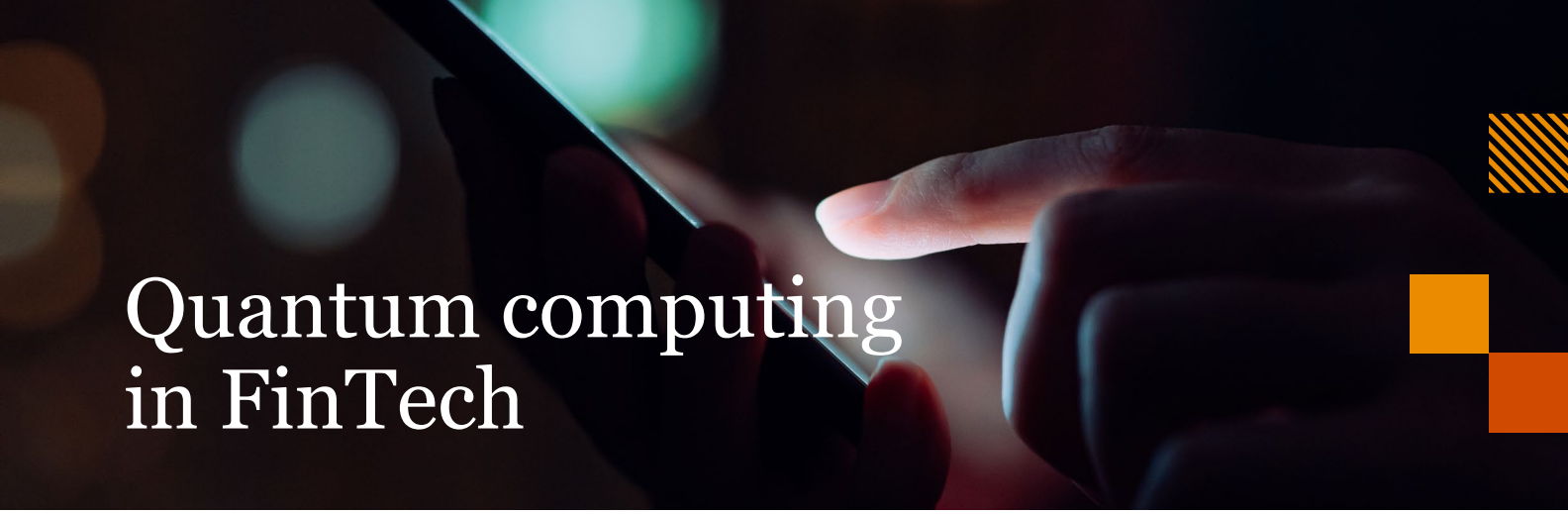
- Q&A chatbots: handle HR functions
- Data analytics: fraud prevention
- Risk assessment: credit monitoring

Shin Wee Chuang
Co-Founder and CEO of Pand.ai

Pand.ai is a Singapore-based start-up company which builds Artificial Intelligence chatbots to help businesses improve operational efficiency.

> AI is a tool to amplify human productivity and creativity. AI can add extra business benefit by replacing routine jobs and creating more humanistic service jobs.

[17]Singapore's MAS launches Veritas Toolkit 2.0 for responsible AI in FinTech, 2023, FinTech Global
[18]A holistic approach to reinventing finance, 2024, HSBC Singapore



Quantum computing in FinTech

Pushing the boundaries of technological limits

In the age of rapid technological innovation, quantum computing has emerged as a ground-breaking force, with the potential to revolutionise Singapore's FinTech industry.

Benefits

Superior data analysis and modelling

Running data through quantum algorithms can lead to more precise pricing models.

Fast processing speed

Quantum algorithms can process patterns and anomalies at a speed faster than traditional computing.

Optimised machine learning

The ability to explore multiple solutions simultaneously accelerates the training times for machine learning algorithms.

Concerns

Technical complexity

Building and maintaining the sophisticated infrastructure needed for quantum computing is a complex task.

Integration with traditional computing

Achieving seamless integration between quantum computing and traditional computing is a significant challenge.

At a glance:

1 Revolutionising data processing

Quantum bits – also known as qubits, can exist in a superposition of two states (1 and 0), and settle on one state or the other only when a measurement of the state is made to retrieve the output of the computation of multiple states simultaneously, which allows processing complex financial calculations with unprecedented speed.

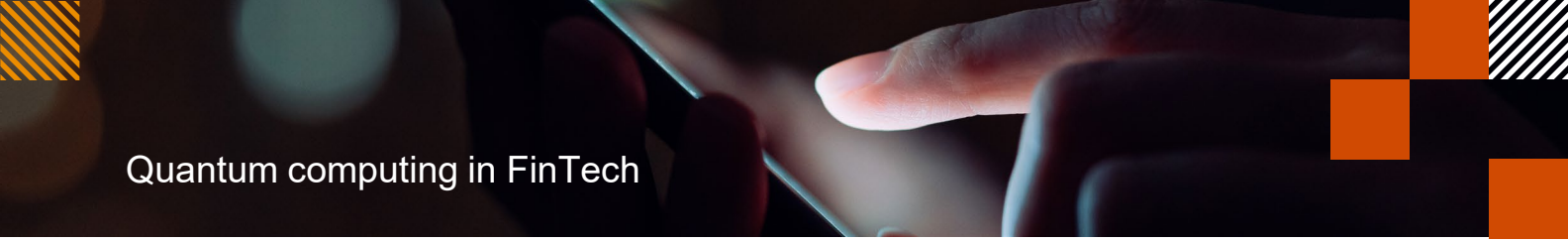
2 Efficient portfolio management

Quantum algorithms analyse large datasets fast, accelerating Monte Carlo simulations and the development of more accurate financial predictions.

3 Overcoming encryption barriers

According to PwC UK, quantum computers can "completely undermine the security framework that makes online commerce and communication possible". While this poses a challenge for cybersecurity, it also drives the development of quantum-resistant encryption algorithms and enables stronger encryption standards[19].

[19]Tech Translated: Quantum Cryptography, 2024, s+b a PwC publication



Quantum computing in FinTech

Stronger encryption standards

Quantum computing leverages quantum mechanics to process information in a fundamentally different way from classical computers – by using qubit, which can exist as a superposition of 0 and 1, enabling vastly superior calculations for speed and processing power.

Research conducted by Triple A showed that the ownership rates of cryptocurrencies average at 4.2% with a user base exceeding 420m individuals globally, indicating that cryptocurrencies are on the rise.

With the emergence of quantum computing, the current cryptographic algorithms used by cryptocurrencies are facing a potential threat of being compromised.

To address this issue, developers are actively working on quantum-resistant cryptocurrencies that are resistant to quantum computing attacks. They use post-quantum cryptography that is designed to withstand reverse encryption by quantum computers.

Portfolio optimisation

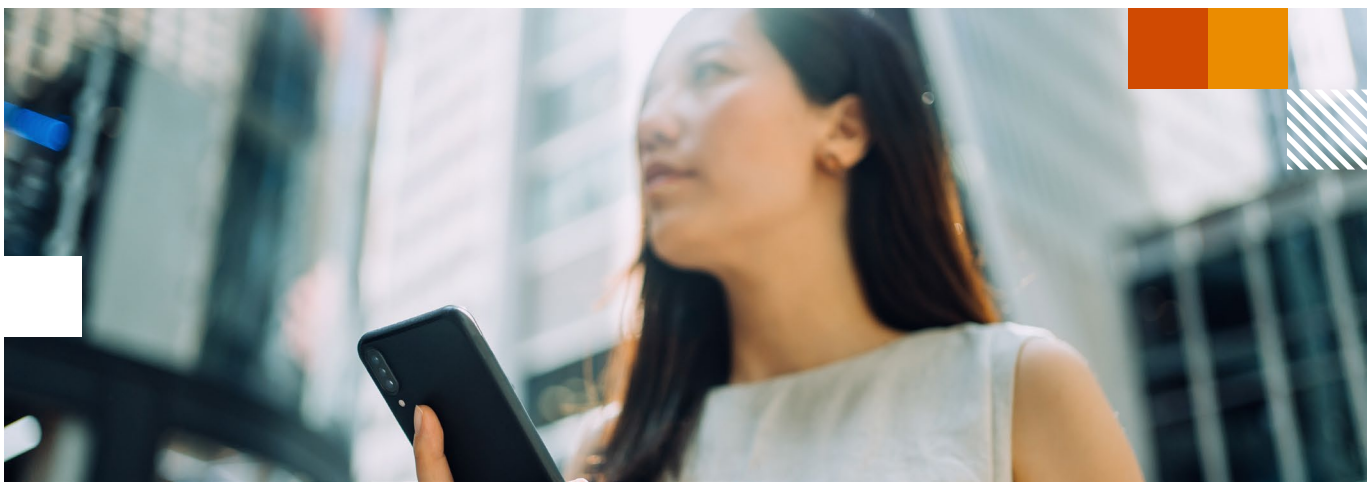
Quantum computing can swiftly analyse vast datasets to identify hidden patterns and correlations that classical computers would take years to decipher, offering faster and more precise predictive models.

Anti-money laundering initiatives

Quantum computing can leverage on machine learning to analyse vast amounts of data and identify anomalies that may indicate anti-money laundering and combating the financing of terrorism (AML/CFT) risks.

Category	Applications	Value creation potential (low)	Value creation potential (high)
Cryptography	Encryption/decryption	40 billion	80 billion
Optimisation	Portfolio optimisation	20 billion	50 billion
Machine learning	Fraud and money-laundering prevention	20 billion	30 billion

Source: What Happens When 'If' Turns to 'When' in Quantum Computing?, By Jean-François Bobier, Matt Langione, Edward Tao, and Antoine Gourevitch



Quantum computing – Friend and foe

In recent times, quantum computing has seen a resurgence in its development. Quantum computers, unlike classical computers, use qubits and superposition – the ability to represent both a 0 and 1 at the same time – to perform operations. This massively increases the computing power compared to a classical computer. This also allows for better scalability as the computing power doubles for each qubit added.

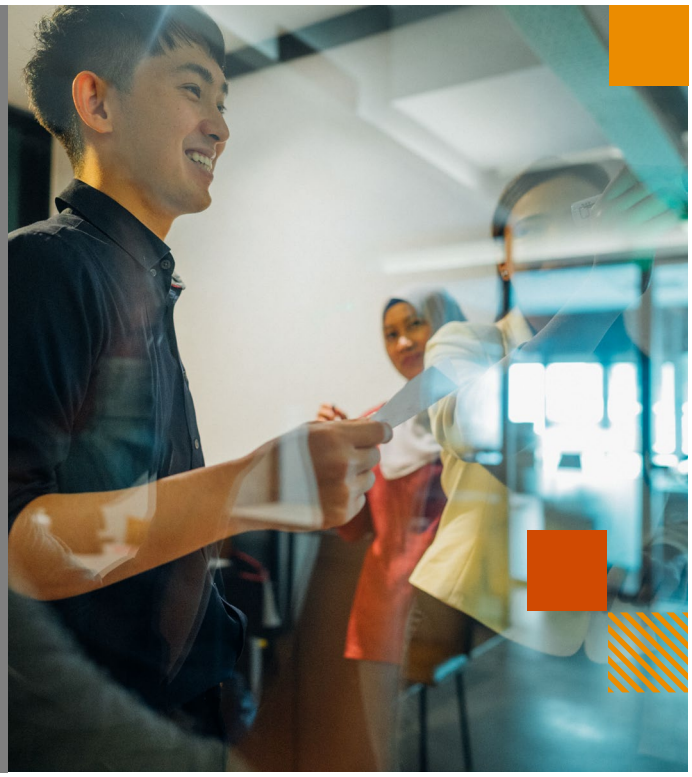
Such an increase in computing ability is a **double-edged sword** – malicious actors can harness the computing power to **break existing cryptographic technologies**, compromising privacy, while financial services can harness the computing power to both **defend against such attacks and boost data analysis** for their operations.

When, not if, Q-Day comes

Existing quantum computers are still in its infancy stage, and none are feasible enough yet to be of good use. That said, technology giants like IBM are developing computers with **up to 1,000 qubits** of computing power. Furthermore, **mathematical proofs have already been done** to prove the threat of quantum computers against existing cryptographic solutions.

It should be a matter of **when, not if,** quantum computing materialises, and the threat is being realized. In preparation for “Q-Day” – the day quantum computers become mature enough to pose a threat – financial services firms must not be caught unprepared which can lead to a collapse of the existing financial system.

It has been estimated that Q-Day will come as soon as the coming, decade according to leading experts.



MAS' Advisory to Financial Institutions

Fortunately, MAS released an advisory in February 2024 to all financial institutions in Singapore on addressing the risks associated with quantum computing.

Financial institutions need to attain crypto-agility to efficiently migrate away from the vulnerable cryptographic algorithms to post-quantum cryptography without significant impact and implement other quantum security solutions such as Quantum Key Distribution (QKD).

Awareness of current trends and risks in quantum computing

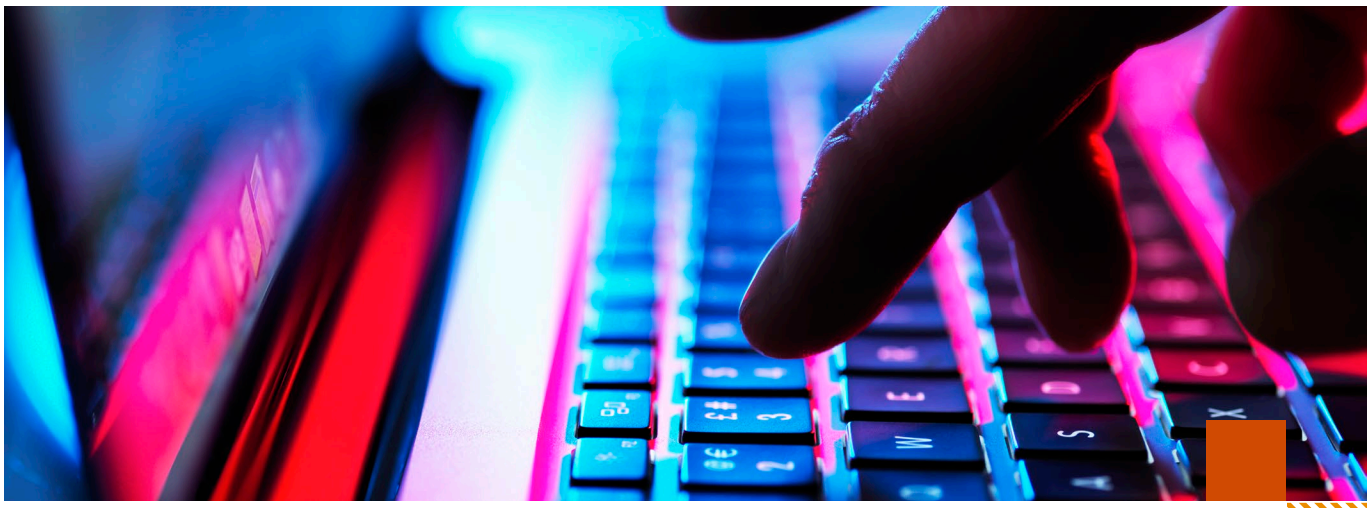
a) Monitor and mitigate quantum threats.
b) Gain management and stakeholders' understanding and support of the threats.
c) Work with existing IT vendors to assess and implement new solutions.
d) Connect with other industry groups to collectively mitigate quantum threats.

Track existing cryptographic assets for immediate replacement need

a) Keep track of existing cryptographic solutions used and identify those that need to be replaced.
b) Classify existing IT systems and data assets dependent on cryptography based on sensitivity, criticality and exposure to prioritise risk mitigation efforts.
c) Assess if existing solutions are agile enough to upgrade to quantum-proof.

Formulate strategies and know-how to address quantum risks

a) Upskill existing staff to support the transition to quantum-proof solutions.
b) Review existing policies and procedures to be quantum-ready.
c) Plan contingencies and develop mitigation plans for equipment that cannot be upgraded to quantum-proof should the threat materialise earlier than expected.
d) Consider proof-of-concept trials for early experimentation.



Snapshot of various quantum computing investments related to Singapore

Singapore government

- The National Quantum Office has unveiled its National Quantum Strategy, investing SGD300m over the next 5 years[20].
- The Monetary Authority of Singapore has also committed SGD100m to support financial institutions in building capabilities in quantum and AI technologies[21].

Temasek

- Temasek has invested EUR100m in a Series B funding for a French quantum computer startup[22].
- Temasek participates in PsiQuantum's US$450m round to build the world's first commercially viable quantum computer.

Tencent and sequoia capital

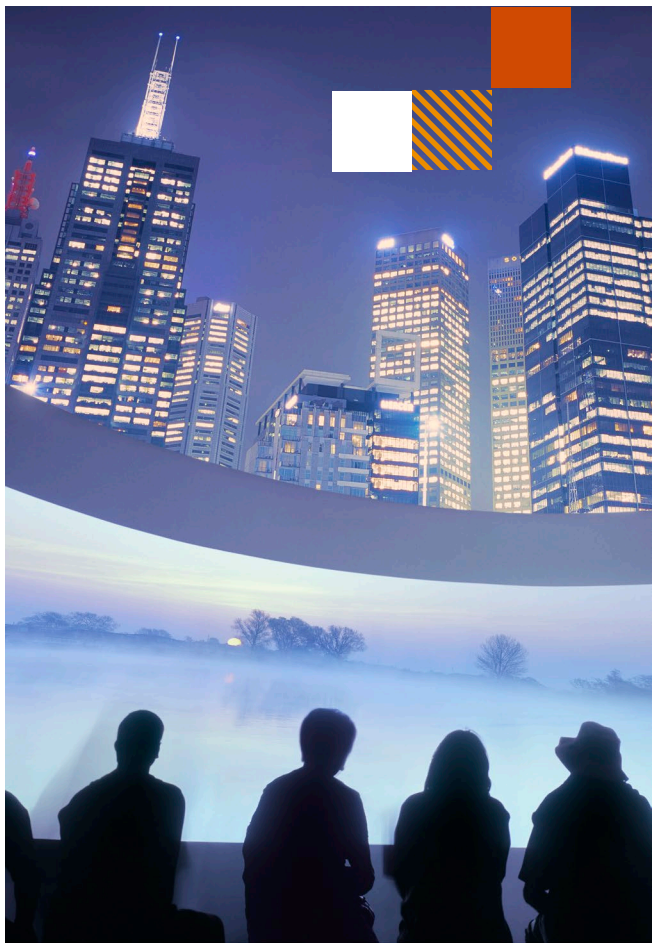
- A Singaporean based quantum computing software developer has raised USD18.1m in Series A funding[23].
- Other prominent investors include SGInnovate, Pappas Capital and Expeditions Fund.
- The funds will be used for product development and expansion into Europe.

Singtel

- Singtel is set to develop Singapore's first Nationwide Quantum-Safe Network Plus for enterprises[24].
- Singtel will partner with ID Quantique to deploy advanced quantum-safe technologies and solutions for stronger data and network security.

Current landscape

In 2023, venture capital investments in quantum-computing start-ups have surpassed USD1.2bn, a significant decrease from USD2.2bn in 2022. However, there was an increase in overall investor activity in the quantum computing sector, even as other prominent tech sectors saw decreased activity. Over 30 governments have committed to more than USD40bn in public funding commitments to quantum technologies[25]. Singapore's Quantum Engineering Programme launched three national platforms to grow the country's capabilities in quantum computing, quantum-safe communication and the manufacturing of quantum devices.



[20]Singapore to invest about S$300 million in quantum tech research and talent, 2024, EDB Singapore
[21]MAS commits S$100 million to support quantum, AI capabilities in financial sector, 2024, Telecoms
[22]French quantum computer startup Pasqal raises 100m euros in Temasek-led funding round, 24 January 2023, The Business Times
[23]Horizon Quantum Computing Raises USD 18.1M in Series A Funding, 2023, FinSMEs
[24]Singtel claims Southeast Asia's first nationwide quantum-safe network, 2024, Telecoms
[25]The State of Quantum in 2024: Progress Amid Cautious Optimism, 2024, Tech Tour

National Quantum Computing Hub

Develop quantum computing capabilities and explore applications through industry collaborations

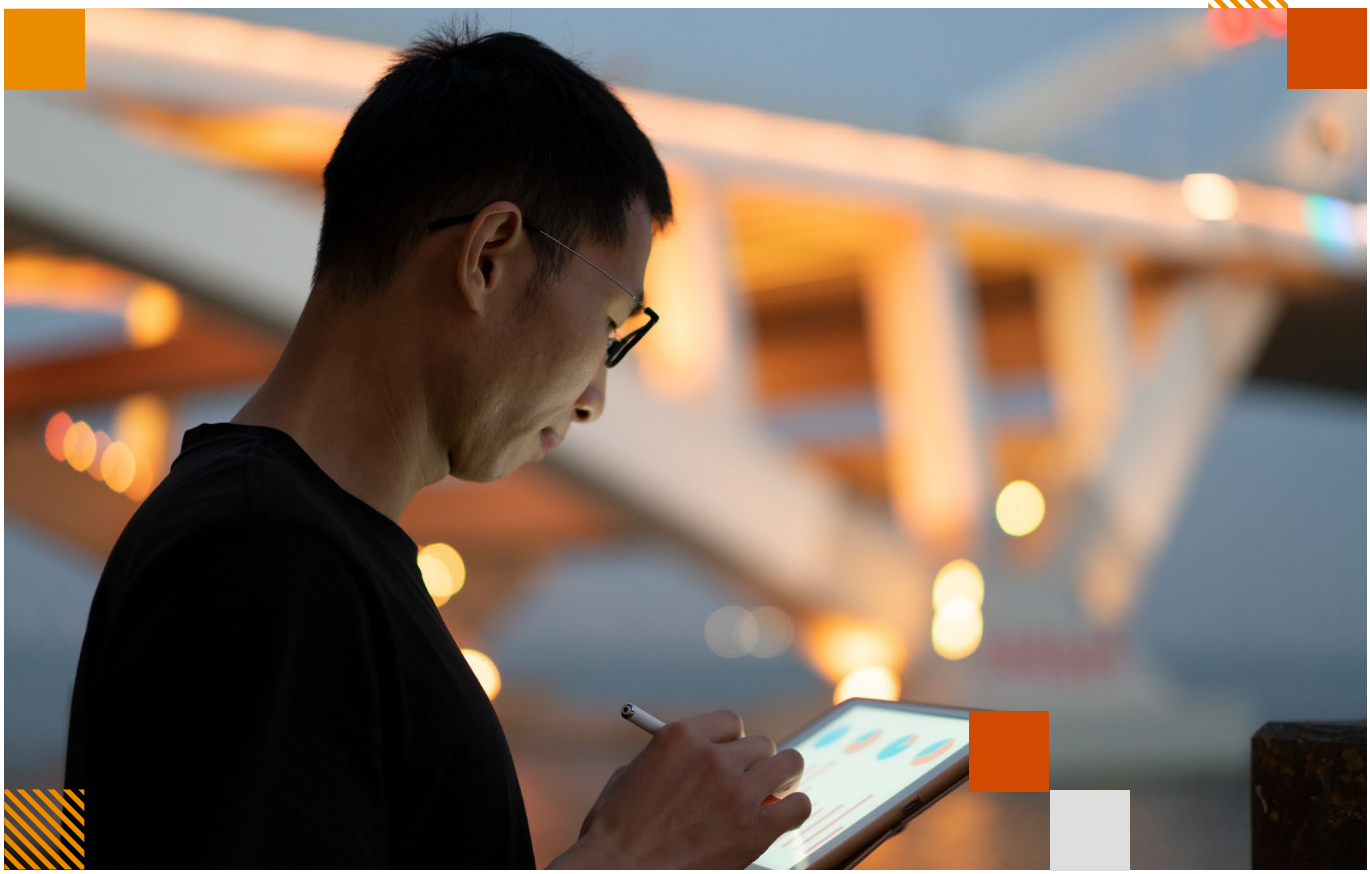
National Quantum Fabless Foundry

Support microfabrication techniques for quantum devices and enabling technologies

National Quantum-Safe Network

Conduct nationwide trials of quantum-safe communication technologies to enhance network security

These three national platforms will coordinate activities across research organisations and build public-private collaborations to put Singapore at the cutting edge in quantum technologies.



Overview of survey

Over 160+ FinTech firms in Singapore responded to the FinTech state of play 2.0 survey.

Statistics regarding valuation, new opportunities and emerging FinTech sub-sectors, in which companies have been established were analysed.

Responses were categorised into the different product offerings for the FinTech industry and compared with statistics from the survey conducted in 2022.

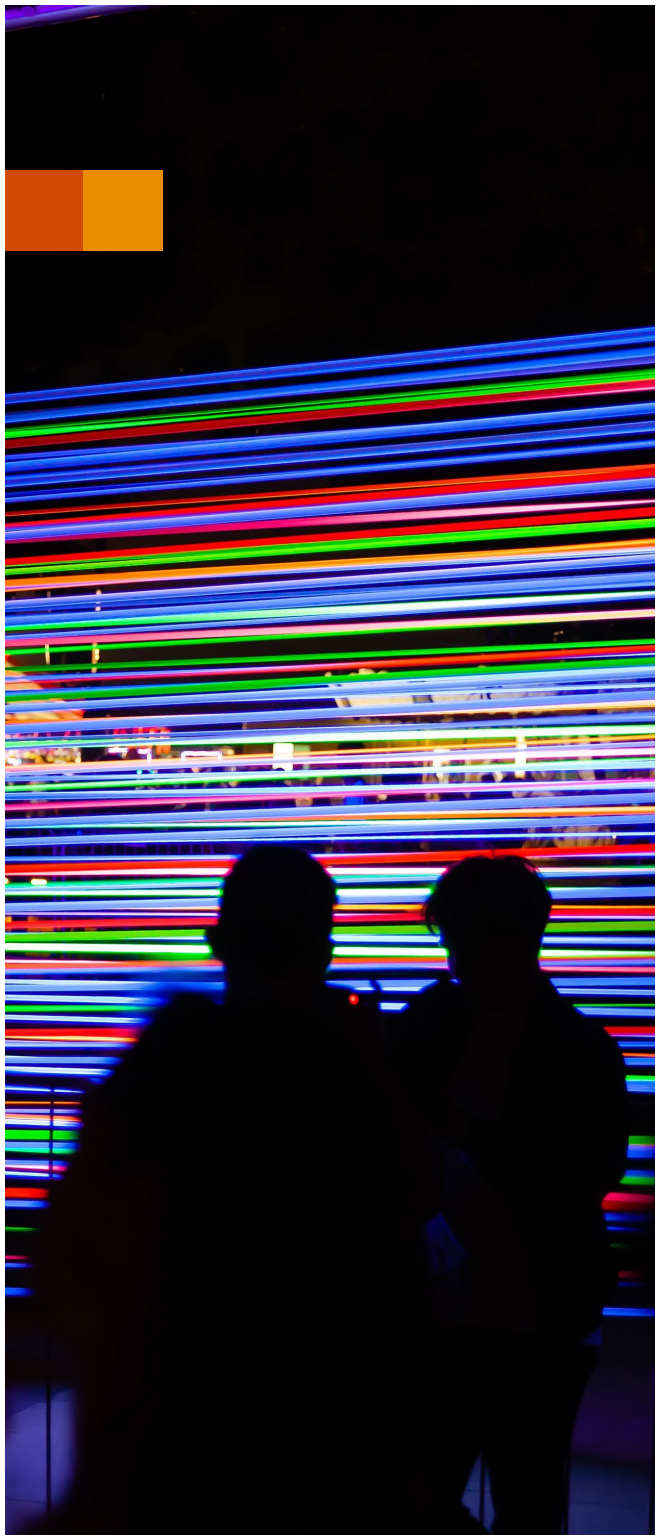
Predictions for the future of the FinTech landscape were also compiled, alongside some key priorities and concerns of firms moving forward.

This survey aimed to paint a picture of the current and future FinTech landscape in Singapore.

Of the total respondents, there was a mixture of the various categories and subcategories of FinTech products and solutions offered.

Categories and subcategories were created with input from the Singapore FinTech Association

Additional inputs were taken from industry experts such as Ms. Sharon Lourdes, Co-Founder and CEO of Headquarters and Mr. Chuang Shin Wee, Co-Founder and CEO of Pand.ai., regarding this year's emerging trends focusing on Artificial Intelligence (AI) and Quantum Computing (QC).



About us

About PwC

At PwC, our purpose is to build trust in society and solve important problems - this is at the core of everything we do from the value we provide to our clients and society to the decisions we make as a firm.

Our services started with audit and assurance over a century ago. As times change and the issues faced by businesses and individuals evolved, we have developed specialised capabilities in tax, advisory and consulting to help you address emerging new challenges across focus areas like ESGTech, sustainability and climate change, digital transformation, cyber security and privacy, data, mergers and acquisitions, and more.

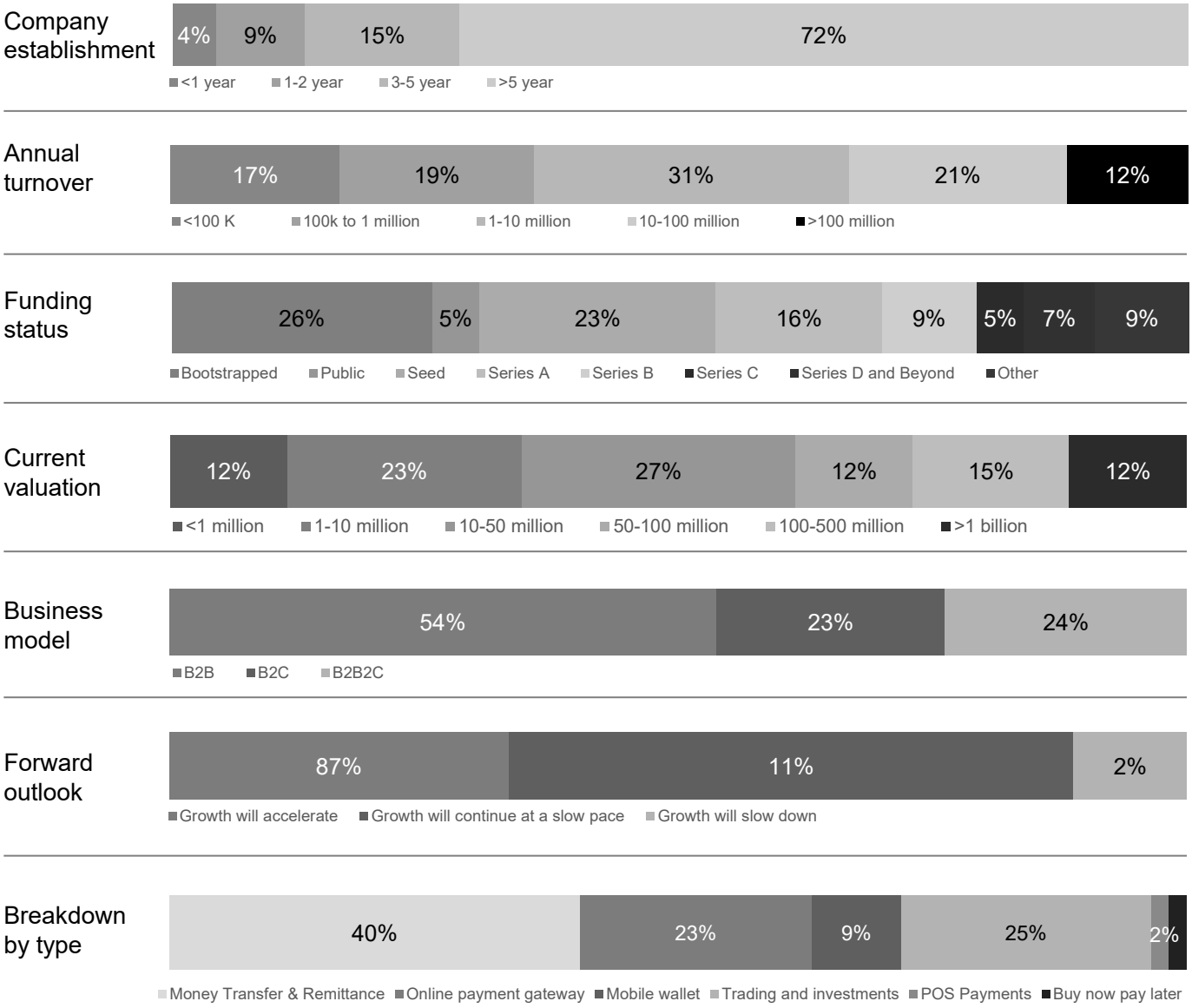
In Singapore, we have more than 3,500 partners and staff to help resolve complex issues and identify opportunities for public, private and government organisations to progress. As part of the PwC network of nearly 328,000 people in 152 countries, we are among the leading professional services networks in the world focusing on helping organisations and individuals create the value they are looking for.

About Singapore FinTech Association

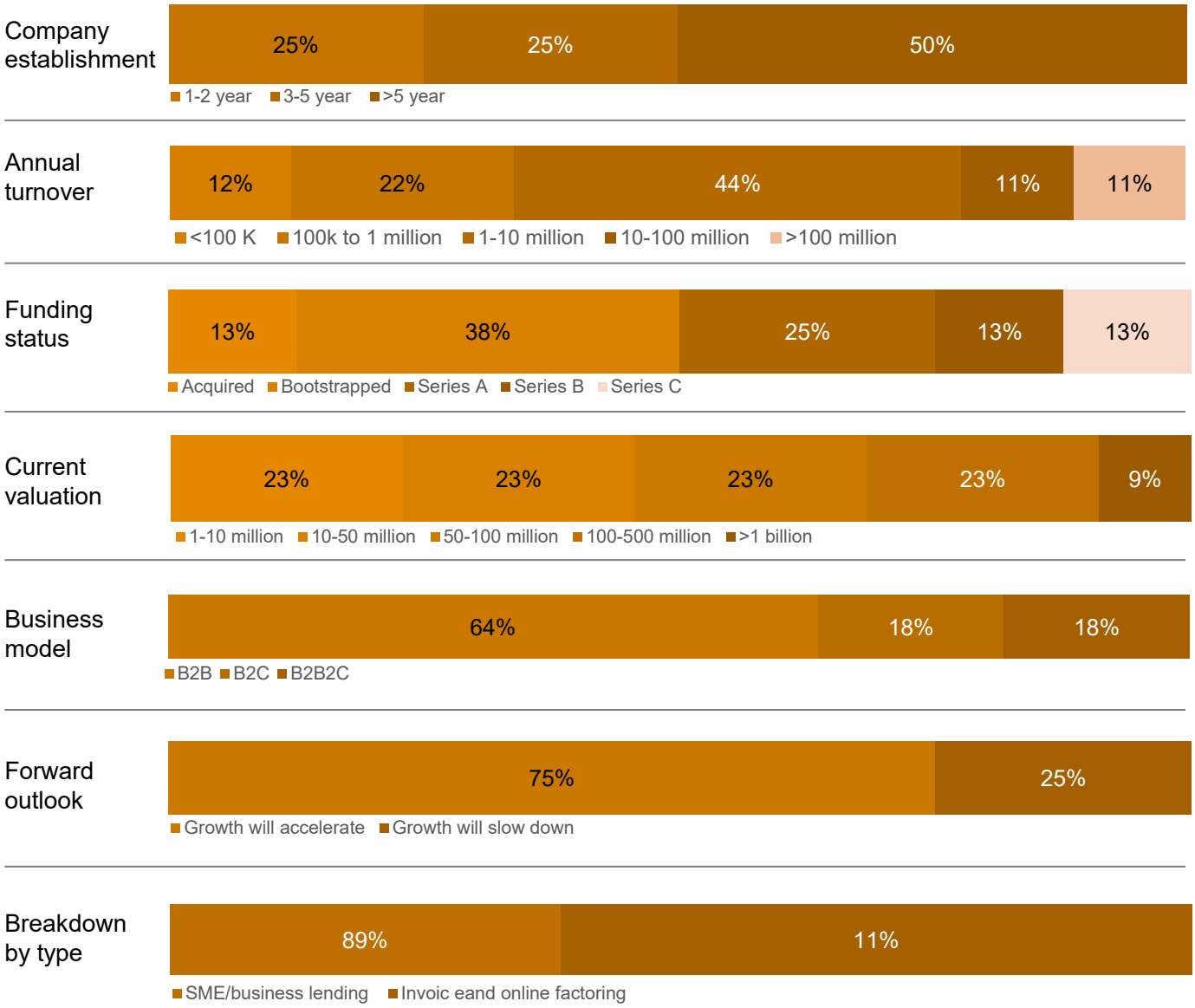
The SFA is a cross-industry non-profit organisation. Its purpose is to support the development of the FinTech industry in Singapore and facilitate collaboration among the participants and stakeholders. The SFA is a member-based organisation with over 800+ members. It represents the full range of stakeholders in the FinTech industry, from early-stage innovative companies to large financial players and service providers. To further its purpose, the SFA also partners with institutions and associations from Singapore and globally to cooperate on initiatives relating to the FinTech industry. Well-connected globally, the SFA has signed over 70 international Memorandum of Understanding (MoU) to lay the network for its members and ecosystem.

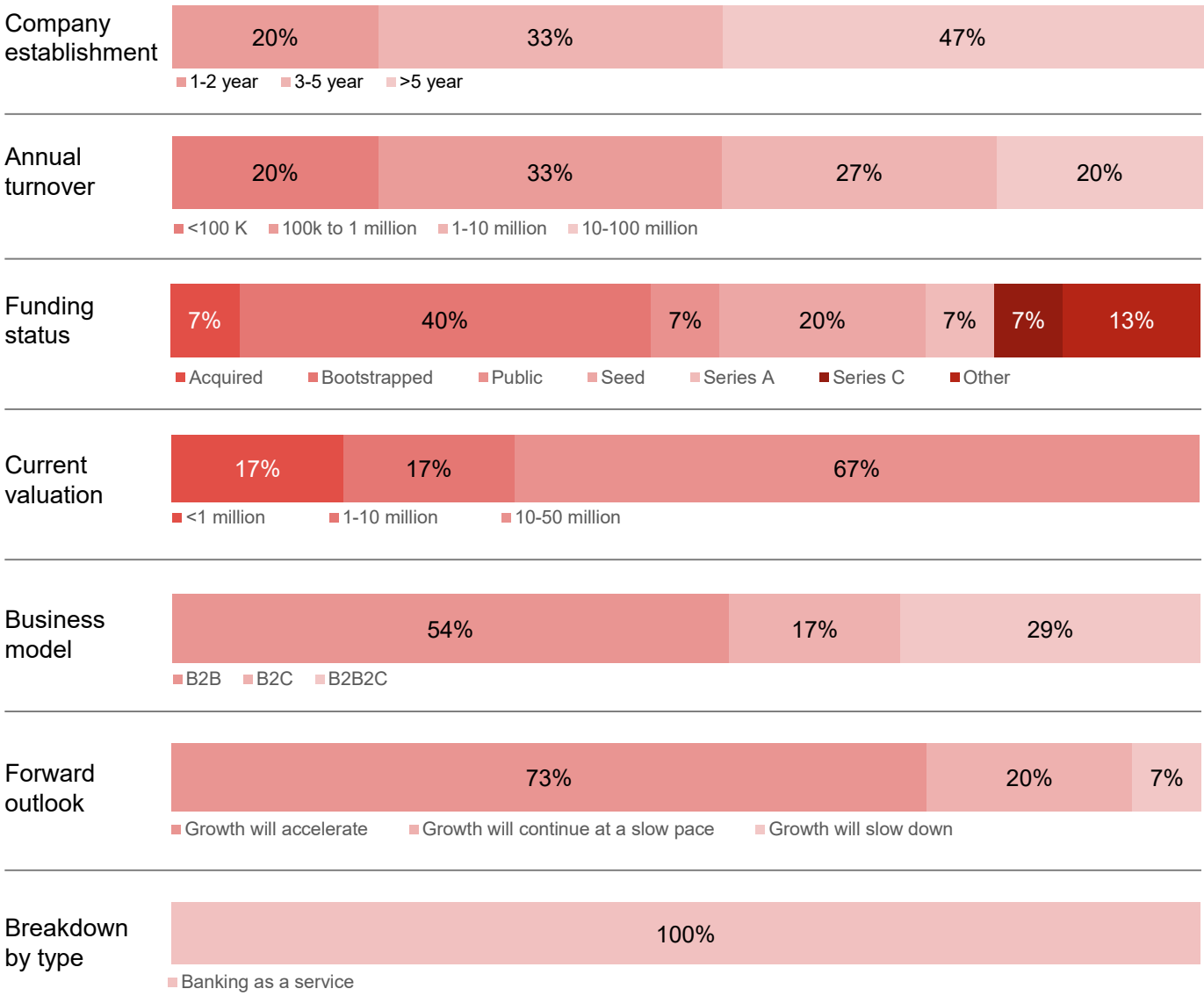
Appendix

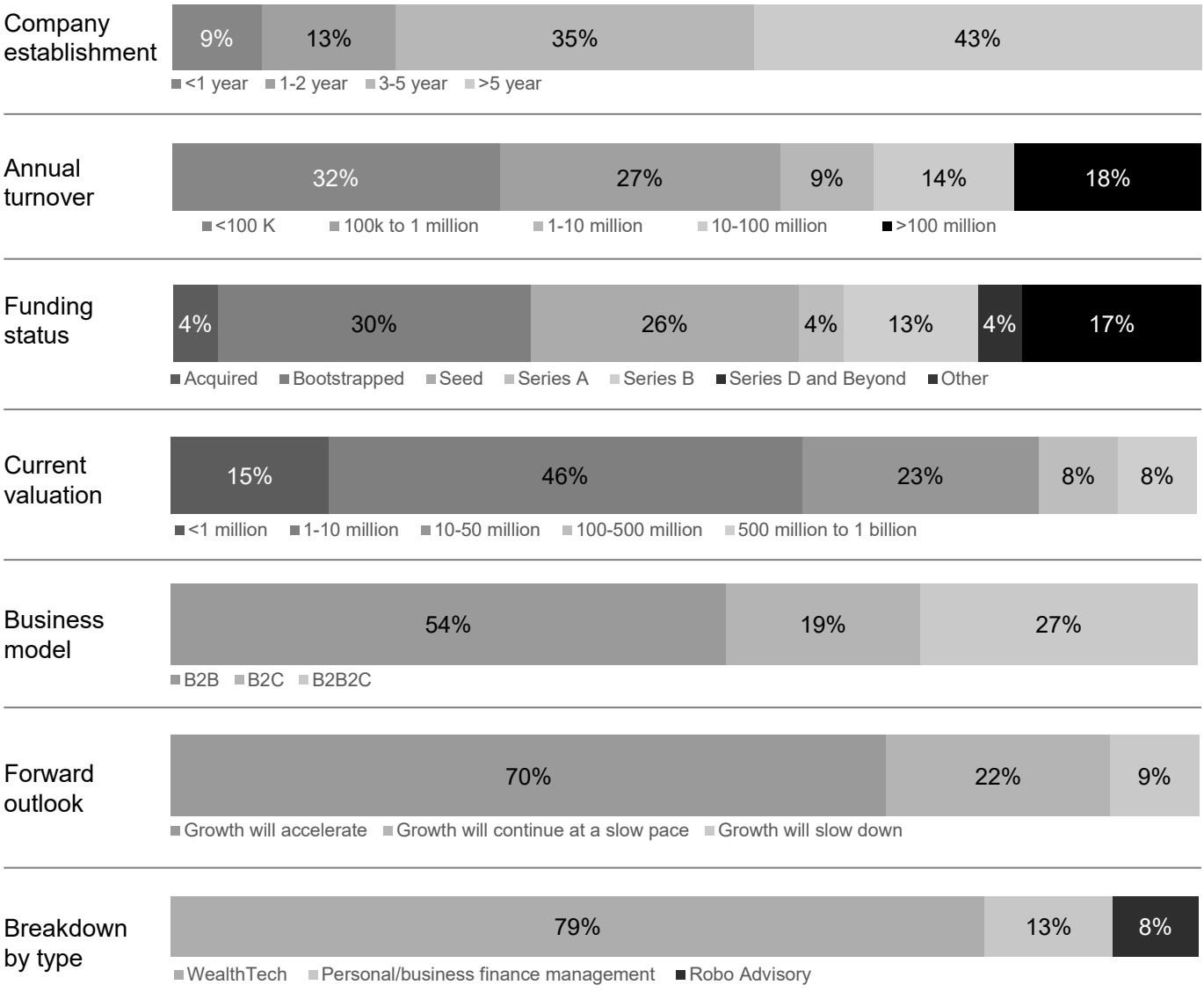
Detailed survey findings

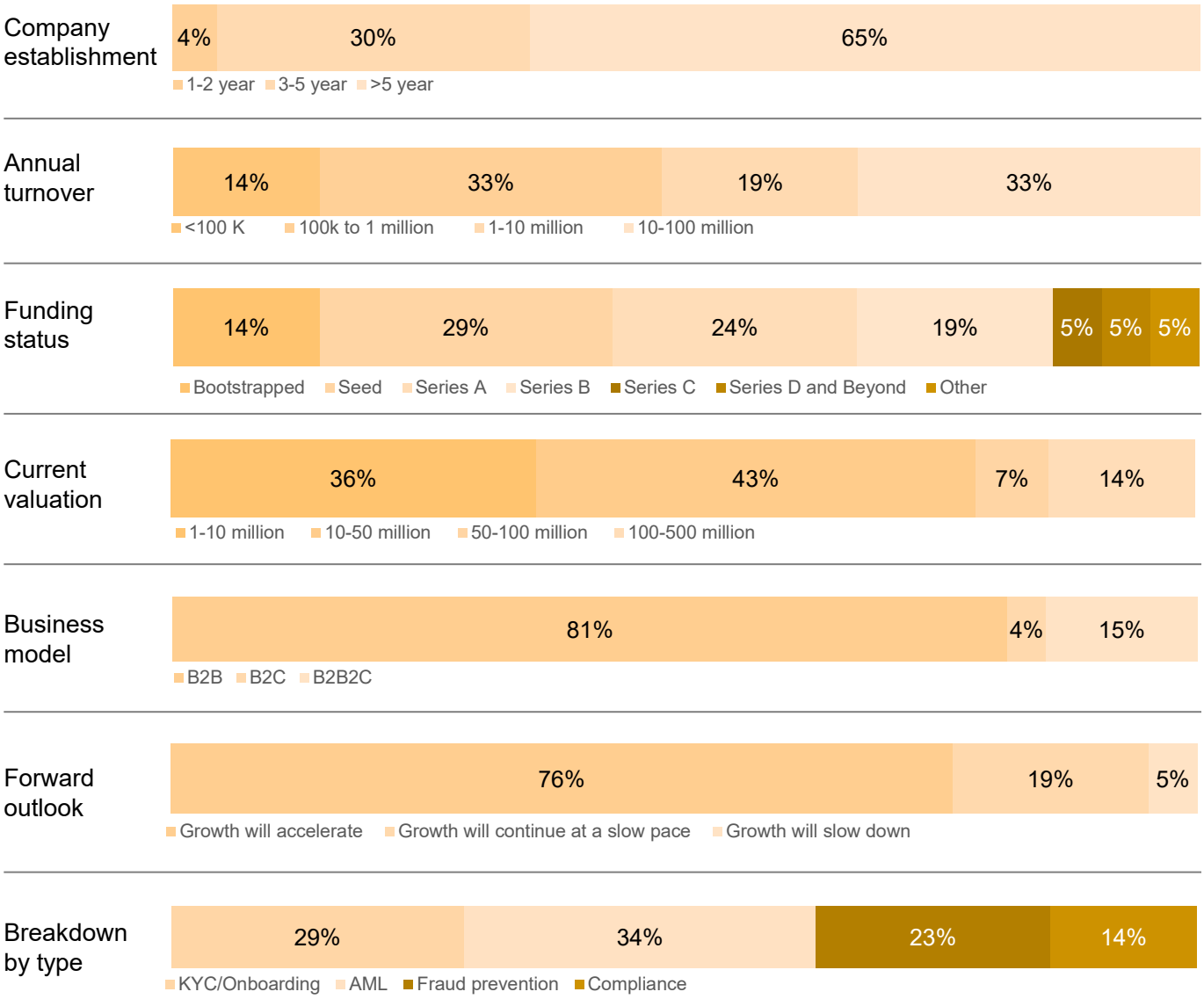

Company establishment
4%
9%
15%
72%
<1 year
1-2 year
3-5 year
>5 year
Annual turnover
17%
19%
31%
21%
12%
<100 K
100k to 1 million
1-10 million
10-100 million
>100 million
Funding status
26%
5%
23%
16%
9%
5%
7%
9%
Bootstrapped
Public
Seed
Series A
Series B
Series C
Series D and Beyond
Other
Current valuation
12%
23%
27%
12%
15%
12%
<1 million
1-10 million
10-50 million
50-100 million
100-500 million
>1 billion
Business model
54%
23%
24%
B2B
B2C
B2B2C
Forward outlook
87%
11%
2%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
40%
23%
9%
25%
2%
Money Transfer & Remittance
Online payment gateway
Mobile wallet
Trading and investments
POS Payments
Buy now pay later

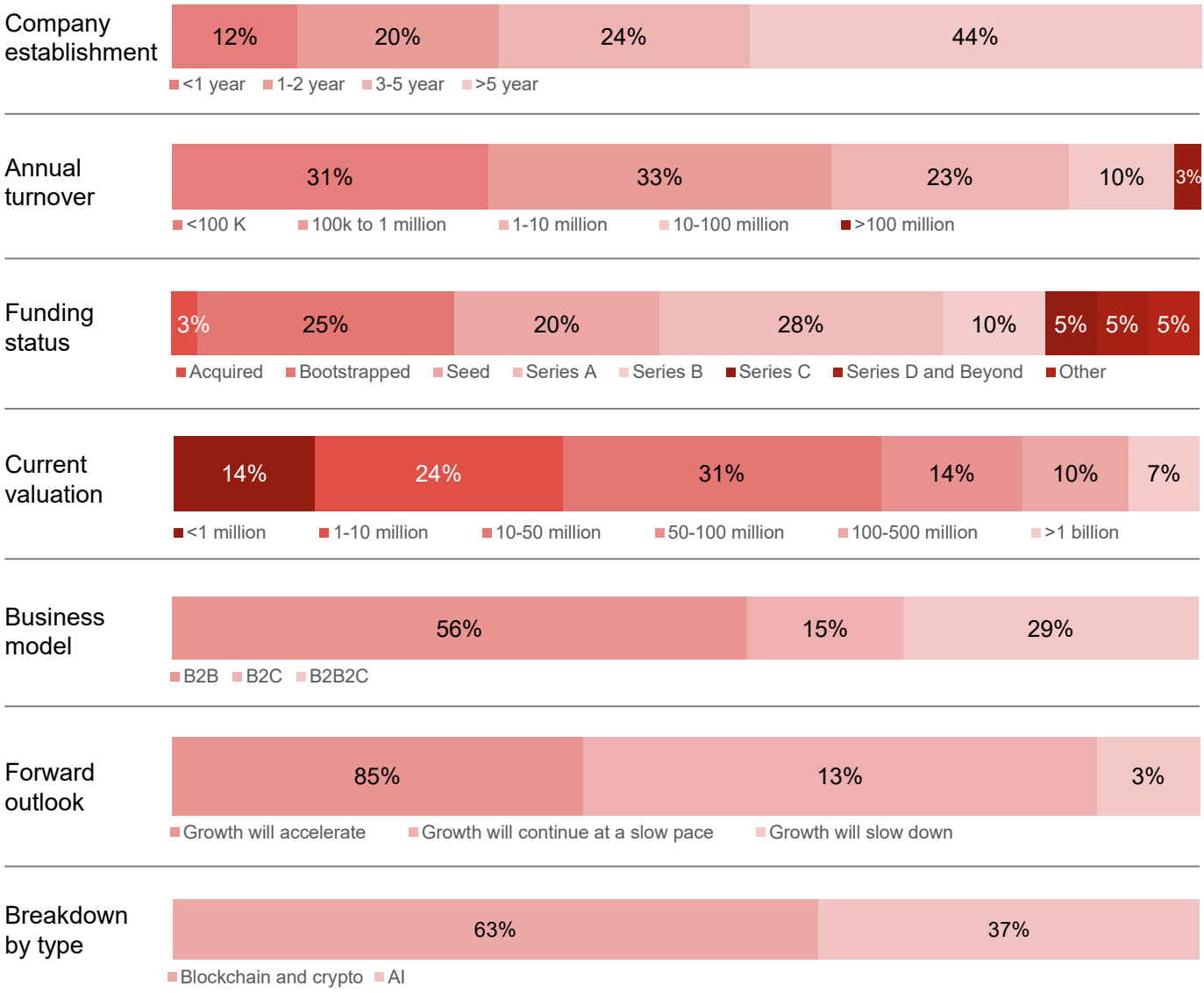
Lending

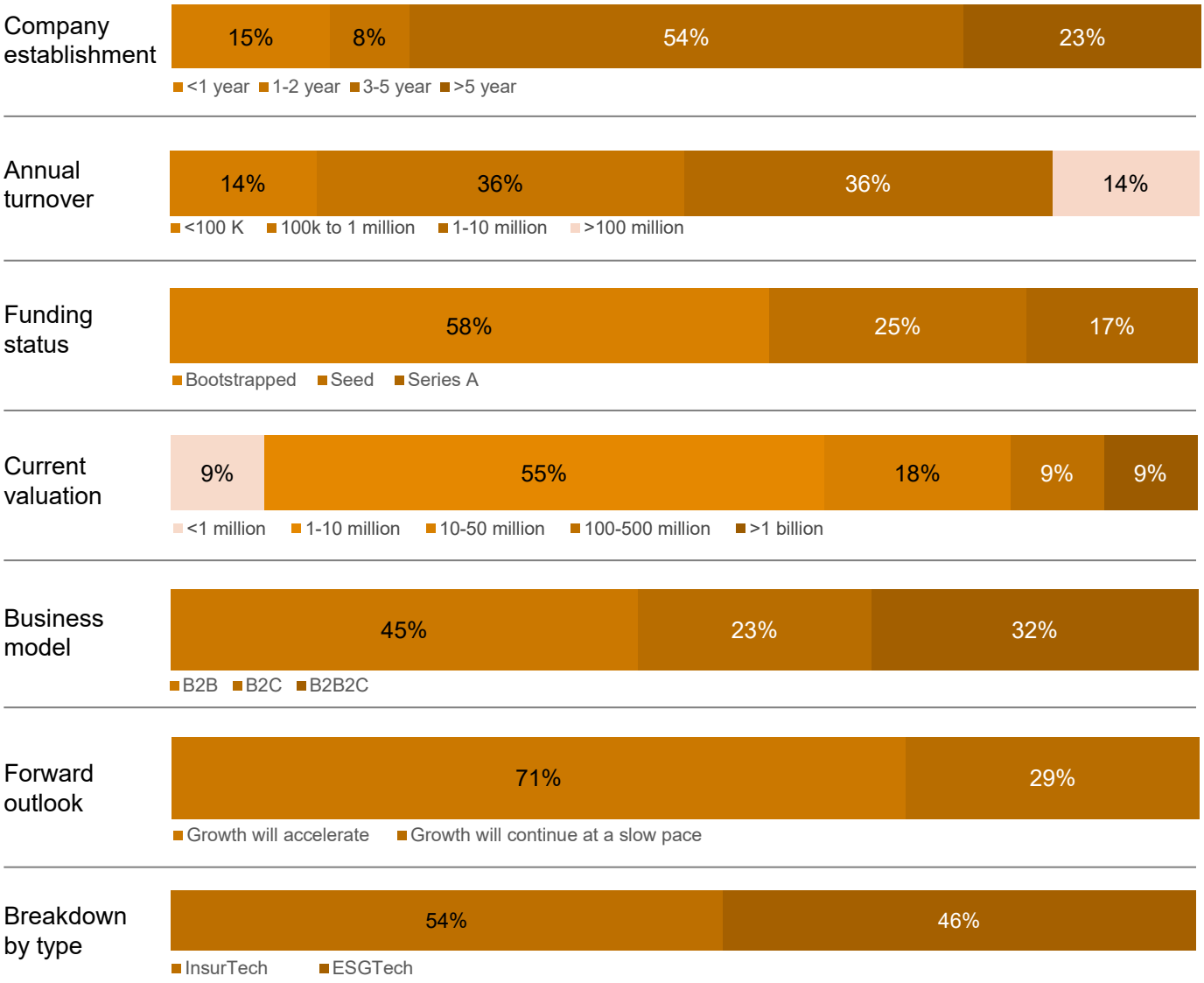

Company establishment
25%
25%
50%
1-2 year
3-5 year
>5 year
Annual turnover
12%
22%
44%
11%
11%
<100 K
100k to 1 million
1-10 million
10-100 million
>100 million
Funding status
13%
38%
25%
13%
13%
Acquired
Bootstrapped
Series A
Series B
Series C
Current valuation
23%
23%
23%
23%
9%
1-10 million
10-50 million
50-100 million
100-500 million
>1 billion
Business model
64%
18%
18%
B2B
B2C
B2B2C
Forward outlook
75%
25%
Growth will accelerate
Growth will slow down
Breakdown by type
89%
11%
SME/business lending
Invoic eand online factoring

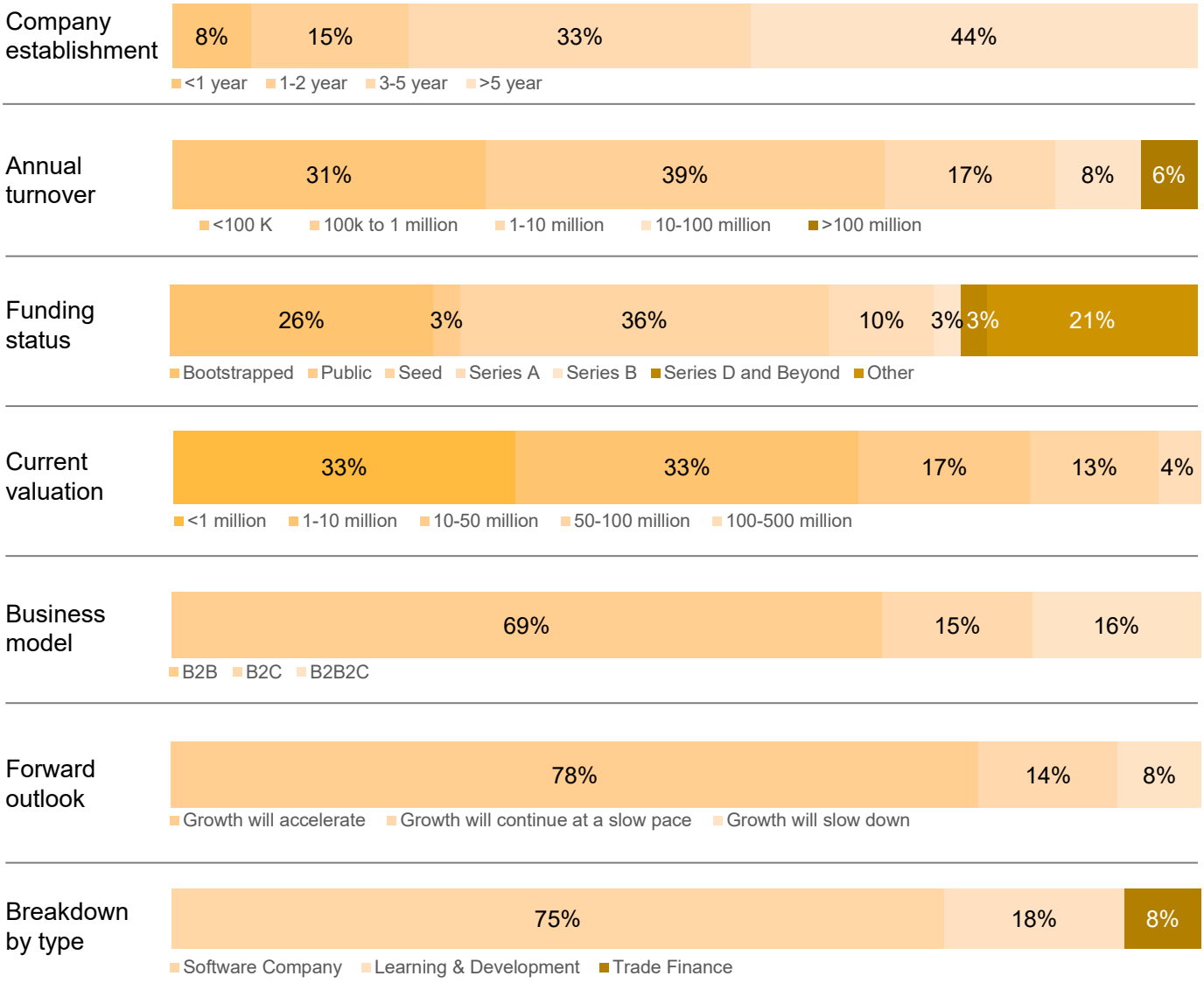

Company establishment
20%
33%
47%
1-2 year
3-5 year
>5 year
Annual turnover
20%
33%
27%
20%
<100 K
100k to 1 million
1-10 million
10-100 million
Funding status
7%
40%
7%
20%
7%
7%
13%
Acquired
Bootstrapped
Public
Seed
Series A
Series C
Other
Current valuation
17%
17%
67%
<1 million
1-10 million
10-50 million
Business model
54%
17%
29%
B2B
B2C
B2B2C
Forward outlook
73%
20%
7%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
100%
Banking as a service


Company establishment
9%
13%
35%
43%
<1 year
1-2 year
3-5 year
>5 year
Annual turnover
32%
27%
9%
14%
18%
<100 K
100k to 1 million
1-10 million
10-100 million
>100 million
Funding status
4%
30%
26%
4%
13%
4%
17%
Acquired
Bootstrapped
Seed
Series A
Series B
Series D and Beyond
Other
Current valuation
15%
46%
23%
8%
8%
<1 million
1-10 million
10-50 million
100-500 million
500 million to 1 billion
Business model
54%
19%
27%
B2B
B2C
B2B2C
Forward outlook
70%
22%
9%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
79%
13%
8%
WealthTech
Personal/business finance management
Robo Advisory


Company establishment
4%
30%
65%
1-2 year
3-5 year
>5 year
Annual turnover
14%
33%
19%
33%
<100 K
100k to 1 million
1-10 million
10-100 million
Funding status
14%
29%
24%
19%
5%
5%
5%
Bootstrapped
Seed
Series A
Series B
Series C
Series D and Beyond
Other
Current valuation
36%
43%
7%
14%
1-10 million
10-50 million
50-100 million
100-500 million
Business model
81%
4%
15%
B2B
B2C
B2B2C
Forward outlook
76%
19%
5%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
29%
34%
23%
14%
KYC/Onboarding
AML
Fraud prevention
Compliance


Company establishment
12%
20%
24%
44%
<1 year
1-2 year
3-5 year
>5 year
Annual turnover
31%
33%
23%
10%
3%
<100 K
100k to 1 million
1-10 million
10-100 million
>100 million
Funding status
3%
25%
20%
28%
10%
5%
5%
5%
Acquired
Bootstrapped
Seed
Series A
Series B
Series C
Series D and Beyond
Other
Current valuation
14%
24%
31%
14%
10%
7%
<1 million
1-10 million
10-50 million
50-100 million
100-500 million
>1 billion
Business model
56%
15%
29%
B2B
B2C
B2B2C
Forward outlook
85%
13%
3%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
63%
37%
Blockchain and crypto
AI


Company establishment
15%
8%
54%
23%
<1 year
1-2 year
3-5 year
>5 year
Annual turnover
14%
36%
36%
14%
<100 K
100k to 1 million
1-10 million
>100 million
Funding status
58%
25%
17%
Bootstrapped
Seed
Series A
Current valuation
9%
55%
18%
9%
9%
<1 million
1-10 million
10-50 million
100-500 million
>1 billion
Business model
45%
23%
32%
B2B
B2C
B2B2C
Forward outlook
71%
29%
Growth will accelerate
Growth will continue at a slow pace
Breakdown by type
54%
46%
InsurTech
ESGTech


Company establishment
8%
15%
33%
44%
<1 year
1-2 year
3-5 year
>5 year
Annual turnover
31%
39%
17%
8%
6%
<100 K
100k to 1 million
1-10 million
10-100 million
>100 million
Funding status
26%
3%
36%
10%
3%
3%
21%
Bootstrapped
Public
Seed
Series A
Series B
Series D and Beyond
Other
Current valuation
33%
33%
17%
13%
4%
<1 million
1-10 million
10-50 million
50-100 million
100-500 million
Business model
69%
15%
16%
B2B
B2C
B2B2C
Forward outlook
78%
14%
8%
Growth will accelerate
Growth will continue at a slow pace
Growth will slow down
Breakdown by type
75%
18%
8%
Software Company
Learning & Development
Trade Finance

Contact us

Wanyi Wong
FinTech Leader
PwC Singapore
wanyi.wong@pwc.com
+65 9842 2060

Reuben Lim
Chief Executive Officer
Singapore FinTech Association
reuben.lim@singaporefintech.org