



TECH FOR
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Sandbox To Society: Fostering Innovation In Southeast Asia



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About This Study

The rapid pace of digital adoption has resulted in unprecedented growth in Southeast Asia's digital economy. In sectors such as finance, transport, health and education, businesses are leveraging innovative solutions to help solve societal problems. As a result, a wide range of digital goods and services have entered the market. However, technological advancement has also brought about new risks to its users, especially those who are coming online for the first time. Digital transformation has raised new challenges in pursuing inclusion, ensuring healthy competition, promoting privacy of individuals and protecting users against cyber threats.

To safeguard society from the unintended consequences of technology, governments across Southeast Asia are exploring different regulatory instruments – one of which is implementing **regulatory sandboxes**.

Sandboxes allow governments to partner with the private sector to experiment new technologies in controlled environments. Through this process, policymakers can assess whether the technology is compliant to existing regulations, and identify potential corresponding rules that should be in place before the product or service goes out to the public at scale. The goal is to develop or evolve regulatory frameworks that are fit-for-purpose yet flexible enough to accommodate emerging technologies.

As governments begin to implement sandboxes, it is important to discuss its effectiveness in delivering the intended objectives and explore opportunities for further adaptation, as well as managing risks and innovation in certain sector applications. Understanding what makes an agile and resilient regulatory environment is essential to building an inclusive digital ecosystem.

This report is a landscape study providing an overview of current sandbox initiatives in Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam (collectively known as "SEA-6"). For this study, we consider an initiative as a sandbox when a country specifically brands it as such. Usage of the "sandbox" terminology could be a signal of regulators' priorities and intentions. Publicly available resources were used to gather information. Finally, analysis of this study is based on the World Bank's and Nesta UK's framework on the typologies of sandboxes.

This study is an invitation to conversation and collaboration. It is expected that sandbox practices will continue to evolve as technology continues to develop. The aim is to provide a reference for policymakers, business leaders and academics to understand the current trends of regulatory innovation in the region.

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About the Tech for Good Institute

The Tech for Good Institute is a non-profit organisation working to advance the promise of technology and the digital economy for inclusive, equitable and sustainable growth in Southeast Asia.

With a population twice the size of the US and strong demographics, Southeast Asia's digital economy is evolving rapidly. At the same time, the region's trajectory is unique, shaped by its diverse cultural, social, political and economic contexts. The Tech for Good Institute serves as a platform for research, conversations and collaborations focused on Southeast Asia while staying connected to the rest of the world. Our work is centred on issues at the intersection of technology, society and the economy, and is intrinsically linked to the region's development. We seek to understand and inform policy with rigour, balance and perspective by using research, effective outreach and evidence-based recommendations.

The Institute was founded by Grab, to advance the vision of a thriving, innovative Southeast Asia for all. We welcome opportunities for partnership and support, financial or in-kind, from organisations and individuals committed to fostering responsible innovation and digital progress for sustainable growth in the region.

More information about the Institute can be accessed at www.techforgoodinstitute.org.



Executive Summary

➤ Regulatory sandboxes are a useful tool for policymakers in the digital economy.

It is an instrument that enables regulators to foster innovation in a safe and responsible way, while creating a safe space for closer dialogue between regulators and businesses in various industries. Sandboxes can create opportunities for deeper regulatory learning, and empower regulators to take a more adaptive and anticipatory approach to regulation. However, sandboxes may not be suitable in every jurisdiction as it is resource-intensive and have accompanying risks including regulatory arbitrage, regulatory capture and perceived unfairness to non-participating businesses.

➤ Sandbox initiatives have seen increasing adoption in Southeast Asia since 2016.

While regulatory sandboxes were pioneered in the United Kingdom, it made its way to Southeast Asia from as early as 2016. Since then, the momentum to deploy sandboxes has been building continuously, with more than half of the sandboxes in the region launching in 2020 or later. In line with global trends, sandboxes in the region have gained the most traction in the financial technology sector. Other sectors have started to explore sandbox practices, including transportation, healthcare, drones, robotics, artificial intelligence (AI) and more.

➤ Southeast Asia's implementation of sandbox initiatives vary in administration and implementation.

For this study, we consider an initiative a "sandbox" when the regulatory body calls it as such. This reflects the intention of regulators to test technologies and learn of potential policies to mitigate the risks emerging technologies may bring. There is a variance in administration of sandboxes, with some jurisdictions having clearer and more transparent guidelines than others.

➤ Some sandboxes in Southeast Asia reflect each country's unique context and national priorities.

For example, Singapore's privacy-enhancing technologies (PET) and generative AI sandboxes show the country's focus on emerging technologies. The Philippines implements an agricultural insurance sandbox to protect its farmers, whereas Malaysia operates a drone sandbox to further position the country as the drone hub of Southeast Asia.

➤ Sandboxes in Southeast Asia tend to be innovation-focused rather than policy-focused.

Almost 90% of the sandboxes in the region are focused on product development. Currently, only a few include policies or regulations as a desired outcome. This indicates a presently untapped opportunity for regulators to utilise sandboxes for regulatory learning and policy adoption, particularly in dealing with emerging technologies where the attendant's risks and opportunities are difficult to predict.

➤ Regulators generally take an advisory approach in sandboxes rather than an adaptive or anticipatory one.

The majority of sandboxes (64%) are considered advisory in approach as it was designed to test the viability of new products and business models, and to clarify regulatory grey areas so that businesses can comply with existing regulations. In particular, most of the fintech sandboxes in the region are focused on making it easier for innovators to work with regulators, so that they may test and adapt their product or service under existing regulations, rather than assessing if and how regulations could be changed.

➤ Moving forward, regulators and the private sector can collaborate together to improve the implementation of sandboxes in the region.

For regulators, key considerations include setting clear sandbox guidelines and frameworks, establishing a platform for sharing regulatory learnings, adopting a more anticipatory approach, creating more cross-sectoral sandboxes and coordinating sandbox corridors for cross-border testing. Meanwhile, the private sector should consider being more open to sharing data and expertise to regulators, proactively contribute feedback to improve sandbox administration, and offer dedicated teams to ensure internal alignment and effective participation in sandboxes.



1. Introduction

Southeast Asia's digital transformation presents growth opportunities for the region.

Despite macroeconomic headwinds, SEA-6 digital economies are projected to hit US\$218 billion in transaction value in 2023, exhibiting an 11% growth from last year.¹ Rapid digital adoption among Southeast Asians is fuelling this growth. Since 2019, over 100 million internet users have come online and has led to an increase in consumption of digital goods and services.² It is expected that as governments around the region continue to prioritise digital transformation, the increase in digital consumers will also continue.

The rapid digitalisation, however, poses unique and novel challenges in Southeast Asia.

Innovation in technologies and technology-enabled business models outpace the creation of responsive regulatory frameworks. Digital consumers, especially those who are coming online for the first time, are at risk of being exposed to unintended consequences of emerging technologies. Long-entrenched regulatory frameworks and laws created with an analog world in mind are often not fit-for-purpose to regulate the new digital reality. In addition, governments face the challenge of not over-regulating technologies in order to not stifle its potential to be a growth driver. For regulatory bodies, it is important to balance innovation while safeguarding society's welfare in the context of rapid digital transformation.

In view of these challenges, governments are using innovative approaches to regulate in a safe and responsible manner whilst also encouraging innovation for the public good. Some examples of innovative regulatory approaches include outcome-based or principle-based regulation, co-regulation involving collaboration between industry and government, dynamic regulation using real-time data and analytics to monitor and adjust policies as required, as well as regulatory sandboxes, which will be the focus of this paper.

Regulatory sandboxes are frameworks or environments that allow for the live testing of innovative technologies and business models in a controlled and time-bound manner.³ For the duration of the regulatory sandbox, certain legal requirements may be temporarily relaxed or waived for participating businesses, with appropriate regulatory supervision and safeguards in place.⁴ A sandbox not only

insulates innovations from current regulations, which may be overly restrictive or unfit for purpose, but also mitigates the risk of negative impact for the end user.⁵ Sandboxes may result in several outcomes, including regulatory approval or licensing of the innovation or product, changes to existing regulations or policies, introducing new regulation, or, in the case of a failed test, an order to cease operations.

The sandbox approach entails an interest in regulatory discovery to enable innovation in the policy space.⁷ The focus of the sandbox should not only be on facilitating innovation, but also on regulatory learning.⁸ Through close regulator-firm dialogue facilitated through the sandbox programme, regulators can learn more about new technologies and business models, and its risks and benefits to better formulate fit-for-purpose regulations. This may result in reexamining and reworking of existing policies, or introducing fresh regulations where appropriate. However, regulatory learning may not be prioritised in every case, and some sandboxes may choose to focus more heavily on fostering innovation and test bedding new products in a safe and controlled environment.

1.1. A brief history of sandboxes: From commercial to regulatory

The concept of a 'sandbox' has its roots in software development, where it refers to a software testing environment that enables the isolated execution of software or programs for independent evaluation, monitoring or testing.⁹ Software sandboxes enable the testing of new code or features in ideal conditions, without affecting the environment or platform on which it runs. The sandbox technique is also implemented in cybersecurity to evaluate suspicious software or files containing malicious code.¹⁰

In the government regulation space, the term "sandbox" first started in the financial services sector. "Regulatory sandbox" was first used by the United Kingdom's (UK) Financial Conduct Authority's (FCA) in 2016, when the first cohort of sandboxes were opened under Project Innovate.¹¹ The FCA defines a regulatory sandbox as a 'safe space' in which companies can test innovative products, services, business models and delivery mechanisms without immediately incurring all the normal regulatory consequences of engaging in the activity in question.¹² As of 2022, FCA has received over 550 sandbox applications since its launch in 2016.¹³

An earlier iteration of a regulatory sandbox (though the exact term was not used then) was Project Catalyst, launched by the US's Consumer Finance Protection Bureau (CFPB) in 2012. Project Catalyst introduced various policies designed to support consumer-friendly innovation, including the Office Hours programme to facilitate face-to-face information exchange between innovators and regulators, and the No-Action Letter Policy, which allowed for temporary waiver of enforcement action for certain regulations to reduce regulatory uncertainty for businesses.

1.2. Types of regulatory sandboxes

Globally, sandbox implementation varies depending on the focus and approaches taken by the regulator. Focus refers to the desired outcome of the sandbox, while the approach largely refers to the kind of relationship between the participating firm and the regulator.

In discussing the focus of sandboxes, this paper references the World Bank's framework, which has four categories: innovation (product), policy, thematic and cross-border. Streamlining this framework, this paper opted to highlight innovation (product) and policy sandboxes, which are the more prominent areas of focus in Southeast Asia.

Sandbox focus

A sandbox focus can be on innovation (product) or policy.¹⁴ **Innovation-focused** sandboxes aim to encourage innovation by lowering the cost of entering the regulated marketplace, and allowing businesses to test the viability of new products and business models. On the other hand, **policy-focused** sandboxes use the sandbox process to evaluate specific regulations or policies which may be impeding innovation, with an interest in potentially amending existing regulations or introducing new regulations.¹⁶ These types of sandboxes are not mutually exclusive — an innovation-focused sandbox can also be policy-focused, if the aim of the sandbox is to both foster innovation as well as to evaluate policies.

Sandbox approach

Sandboxes can take different approaches such as: (1) advisory, (2) adaptive, or (3) anticipatory.¹⁷ This categorisation has been developed by Nesta, the UK's innovation agency for social good.

With an **advisory** approach, the sandbox's goal is to reduce regulatory frictions and attract new businesses, by helping innovative new products and services adhere to existing regulations.¹⁸ These innovation-focused sandboxes focus on fostering innovation, rather than making changes to existing regulations or introducing new ones. With such an approach, innovators benefit from temporary relaxations in the full regulatory regime to test the potential impacts of their products or services, and regulators can play a more proactive role in the testing and development of new ideas. Most fintech sandboxes take this approach.¹⁹ One example is the Monetary Authority of Singapore's (MAS) fintech regulatory sandbox — based on the sandbox guidelines, its objective is to “encourage adoption of innovative and safe technology in the financial sector”, with no stated intention to consider revising existing regulations.²⁰

Sandboxes that take an **adaptive** approach aim to first understand the value of these new products or services, by testing in a restricted environment. It then works to adapt both the innovation and/or existing regulations to bring the product or service to market. Unlike the advisory approach, if regulatory barriers are identified, changes to the existing regulations can be explored, generally on a case-by-case basis.²¹ Adaptive approaches to sandbox implementation could be described as innovation-focused sandboxes, which are sufficiently flexible to accommodate regulatory changes if necessary. An example of this is FCA's Project Innovate in the UK. The FCA regulatory sandbox has sought to “reduce some of the existing regulatory barriers” but also to “consider changes to the legislation” and “work with industry”.²²

Finally, some sandboxes take an **anticipatory approach** to regulation. With such an approach, the goal is to better understand the potential impact of an emerging technology and what the corresponding regulatory needs might be.

Anticipatory regulatory approaches can be characterised by six key principles:

- inclusive and collaborative,
- future-facing,
- proactive,
- iterative,
- outcomes-based and
- experimental.²³

One key element of the anticipatory approach to regulatory sandboxes is the building of an information and evidence base through direct research activities in order to identify future potential threats, risks, emerging issues and opportunities around an emerging technology or sector.²⁴ Another important feature is wider inclusion and engagement of a wide variety of stakeholders.²⁵ One example of an anticipatory regulatory sandbox is Singapore's approach to Autonomous Vehicle (AV) regulation. In addition to administering the AV sandbox, the Land Transport Authority (LTA) has also actively engaged a wide variety of stakeholders to co-create national standards. In 2019, the LTA published Technical Reference 68 (TR 68), providing provisional national standards to guide the industry in the development and deployment of fully autonomous vehicles. TR 68 was developed through an industry-led effort made up of four working groups, consisting of representatives from the AV industry, research institutions, institutes of higher learning and government agencies.²⁶

Regardless of the focus and the approach adopted by the regulator, sandboxes have inherent risks and benefits that should be taken into account before considering whether it is appropriate to implement given the sector and the jurisdiction.

1.3. The benefits and risks of regulatory sandboxes

Regulatory sandboxes have the potential to bring a number of benefits to business, regulators and society at large.

For businesses

Sandboxes can help to accelerate time to market. Access to regulators and, in some cases, subject matter experts allow the private sector to better understand how the regulatory framework applies to them, reducing expenditure on external regulatory consultants.²⁷ When governance and product development cycles are shortened it allows businesses to test innovative ideas more quickly. In this way, sandbox participants can benefit from reduced time and cost of getting innovative ideas to market.

Businesses that participate in sandboxes may also enjoy greater access to finance. The UK's FCA found that at least 40% of companies that completed testing in the first cohort received investment during or after its sandbox tests.²⁸ Participating in the sandbox provides a degree of reassurance to investors due to increased regulatory certainty and the oversight the regulator has of the companies' tests.²⁹ Entry into the sandbox also acts as a "stamp of approval" and signals a firm's quality to potential investors.³⁰

For regulators

Closer relationships and enhanced dialogue with innovators within the sandbox may allow policymakers to gain clearer technological and regulatory knowledge. By facilitating continuous open dialogue with businesses at the frontiers of innovation and technology, sandboxes enable regulators to keep pace with new developments. Armed with this knowledge, regulators are better equipped to adopt a more anticipatory³¹ approach to market developments, so that regulations and policies are conducive to innovation. Regulators can make more informed decisions on whether existing regulations need to be adjusted or whether new regulations should be introduced, and how these changes should be implemented. Moreover, the limited reach and use of guardrails in sandboxes enable regulators to mitigate the risks of unintended consequences and to uphold their duty to protect consumers.

For consumers and end users

Sandboxes provide an opportunity for product and market testing in a safe manner, insulated from risks or harms. Testing in a live environment provides businesses with an opportunity to understand consumer receptiveness to different technologies and business models, enabling companies to constantly iterate and improve its product. In addition, sandboxes generally have standard consumer protection safeguards in place, thereby mitigating risks for consumers. Increased adoption of innovative products and services also drives broader consumer benefits and spillover effects for society.³²

While the benefits are clear, there are corresponding risks sandboxes may bring to stakeholders in the innovation ecosystem.

For businesses

Sandboxes pose a risk of creating an unfair advantage for participating businesses. One incentive for businesses to participate in a regulatory sandbox is that it functions as a “badge of honour,” proving its business model in a live and regulated environment, and increasing credibility with its customers and investors.³³ This raises the risk of creating an uneven playing field between businesses inside and outside the sandbox. The benefits made available to participating businesses may be seen as an unfair advantage. To address this, regulators ought to take steps to ensure that sandbox administration is done in a fair and transparent manner. To this end, clear guidelines, eligibility requirements and assessment criteria should be made publicly accessible.

For regulators

Regulatory sandboxes are resource-intensive and may not be suitable in every industry.

Regulators sometimes underestimate the cost and effort involved in launching and operating a sandbox.³⁴ Before setting up a regulatory sandbox, regulators should consider whether they have the requisite funds, manpower, time and capacity to do so. Running a sandbox requires substantial commitment from regulators from start to finish, including reviewing applications, monitoring participants, providing advice and guidance to businesses, evaluating products and innovations, and facilitating exit from the sandbox. Lack of technical staff and capacity may lead to serious consumer protection risks as well as reputational risks for regulators, who may be held responsible for negative outcomes.³⁵

In addition, there is the possibility of regulatory capture, whereby specific business interests are preferred over that of the public and could lead to further reputational risks. Close working relationships between regulators and businesses may lead to undue influence on policy, which could threaten the public interest. Often, businesses that participate in sandboxes may have a higher degree of technical knowledge on how an emerging technology functions as compared to regulators. If regulators rely too heavily on the private sector for technical expertise, there is a risk that private preferences may be privileged over public policy goals.³⁶ Relatedly, overly close relationships could result in groupthink within the sandbox where regulators and the private sector collectively fail to anticipate risks and critically weigh alternative options.³⁷

For consumers and end users

If executed incorrectly, sandboxes may compromise consumer protection. With different jurisdictions taking varying approaches to regulatory sandboxes, there is a risk of regulatory arbitrage. This occurs when businesses flock to the most permissive jurisdictions to circumvent unfavourable regulation. If left unchecked, this may lead to a ‘race to the bottom’ as regulators seek to attract businesses by lowering their regulatory standards, resulting in a general deregulatory trend with more businesses compromising on consumer protection and other important considerations.

1.4. Practical considerations

Before implementing a sandbox, however, there are key practical considerations for the participating businesses and the responsible regulator. This includes ensuring that the legal basis for sandbox practices are in place and that there is follow-through with proper implementation throughout the entire process of a sandbox programme.

Legal basis for sandboxes

In some jurisdictions, particularly the EU and its member states, experimentation clauses form the legal basis for sandboxes.³⁸ These are legal provisions that enables regulators to exercise on a case-by-case basis a degree of flexibility for testing innovative technologies, products, services or approaches.³⁹

However, in most cases, no changes to existing laws are required to establish regulatory sandboxes. It is typically sufficient to invoke the general supervisory powers available to the competent authorities.⁴⁰ Taking the example of fintech sandboxes, regulators in the UK, Denmark and the Netherlands have cited their statutory objectives of contributing to financial stability, promoting confidence in the financial sector and consumer protection as the legal basis for their sandbox initiatives.⁴¹ Meanwhile, one example of a case where changes in the law have been deemed necessary relates to the establishment of autonomous vehicle testbeds as seen in Singapore's Road Traffic (Autonomous Motor Vehicles) Rules 2017.

The sandbox process

As for the actual administration of regulatory sandboxes, this tends to take shape in five key stages:

Table 1. The Sandbox Process

Stage	Role of regulator	Role of applicants / participants
Sandbox conceptualisation and design	Define the sandbox's structure, engage requisite institutions and regulators, collaborate with other actors, verify team capacity and resources, establish eligibility criteria, time frame, regulatory waivers, tools and enforcement.	N/A
Sandbox launch	Publicise the sandbox. Evaluate sandbox applicants, determine whether eligible. Some sandboxes operate on a cohort basis, and some on a rolling basis. For the former, there will be a closing date for applications, before the next cohort is opened.	Assess if eligible for the sandbox. If yes, prepare the necessary paperwork and apply for the sandbox.
Sandbox operation	Engage with participants, determine which regulations should be waived and for how long. Communicate sandbox parameters to each participant. Monitor participants, provide guidance and connections with external and/or internal advisors.	Experiment and test products within the confines of the sandbox. Comply with sandbox requirements, e.g. periodic reporting, disclosure of sandbox participation to customers, etc.
Sandbox exit	Evaluate firms' performance and results of experimentation / testing. Based on the evaluation, either deploy or discontinue the product. Decision depends on various factors, including whether the regulator is satisfied that the sandbox achieved its intended purpose, whether the participant was able to fully comply with relevant requirements, or if a flaw has been discovered in the product posing a risk to consumers which outweighs the benefits.	Once the sandbox experimentation period is over, the participant must exit the sandbox. Typically, firms will be required to comply with prevailing regulations.
Sandbox closure	If the sandbox has achieved its intended purposes, regulators may choose to close it. At this stage, regulators may evaluate and/or amend regulations in light of lessons learned from the sandbox experience.	N/A

Source: Compiled by the Tech for Good Institute, 2023

2. The Sandbox Landscape in Southeast Asia-6

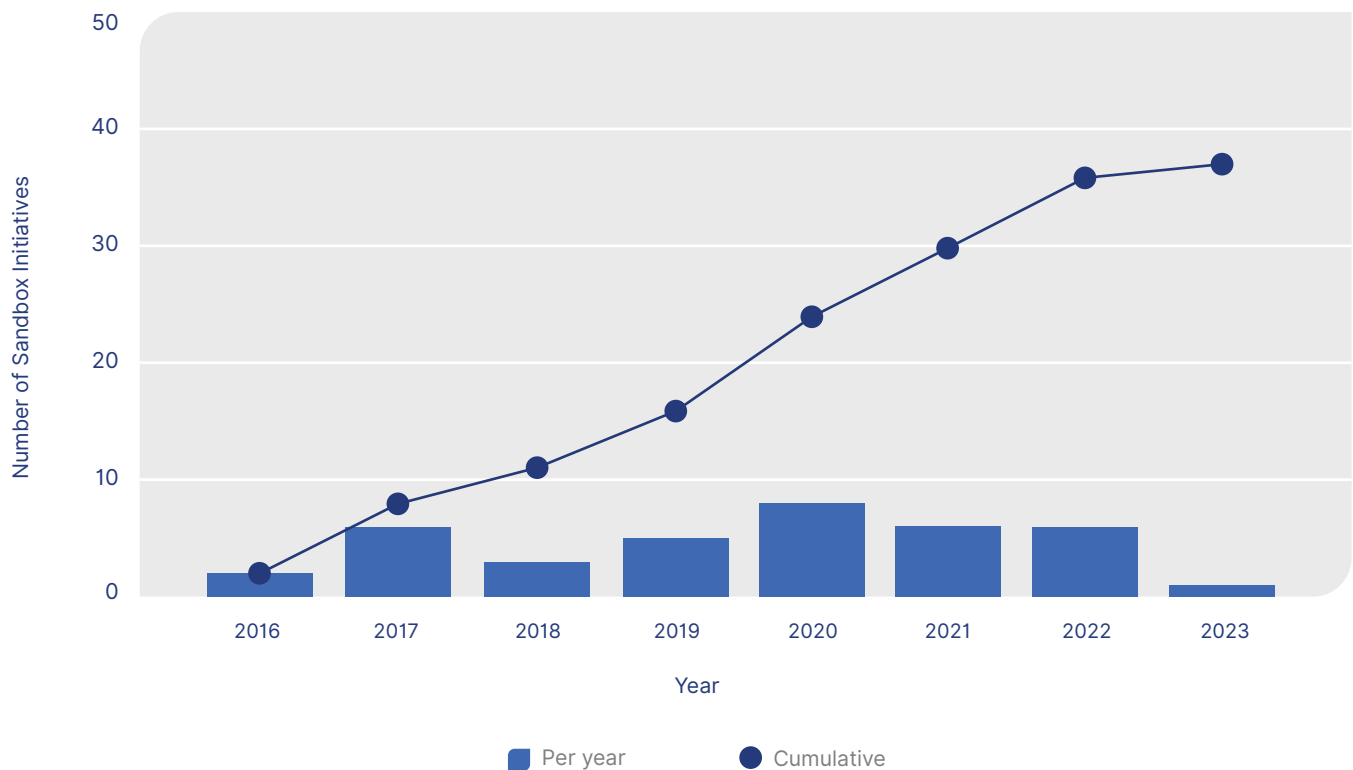


2.1. The state of sandbox implementation in SEA-6

Across countries

Adoption of sandbox initiatives have ramped up since 2016 in the region. As of 2023, there are 39 sandboxes in the region covering various verticals, including fintech, healthcare, transportation, drones, agriculture, energy, environment, built environment and education. Of the 39 sandboxes in this report, more than half were opened in the last three years. Most of the sandboxes in the region were introduced in 2020, and the momentum continued in 2021 and 2022 with six sandboxes opening each year.

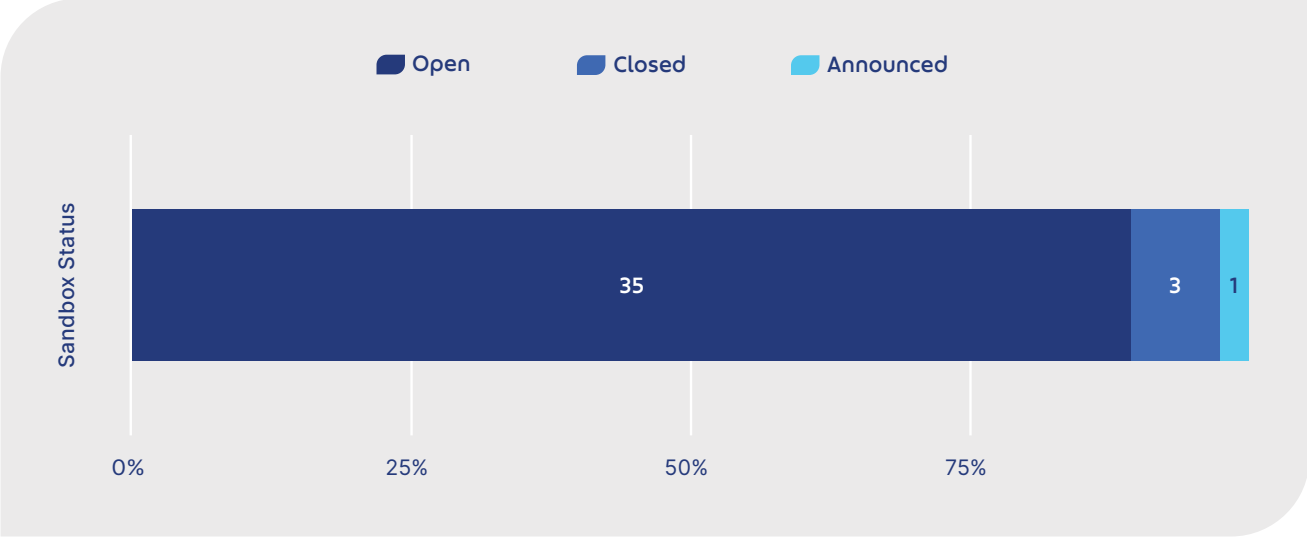
Figure 1. Deployment of Sandbox Initiatives in SEA-6, 2016-2023



Source: Tech for Good Institute, 2023

Sandboxes in the region are in varying stages of implementation. Of the 39 sandboxes, majority of which are still operational (90%), three have been declared closed (8%), and one has been announced to the public.

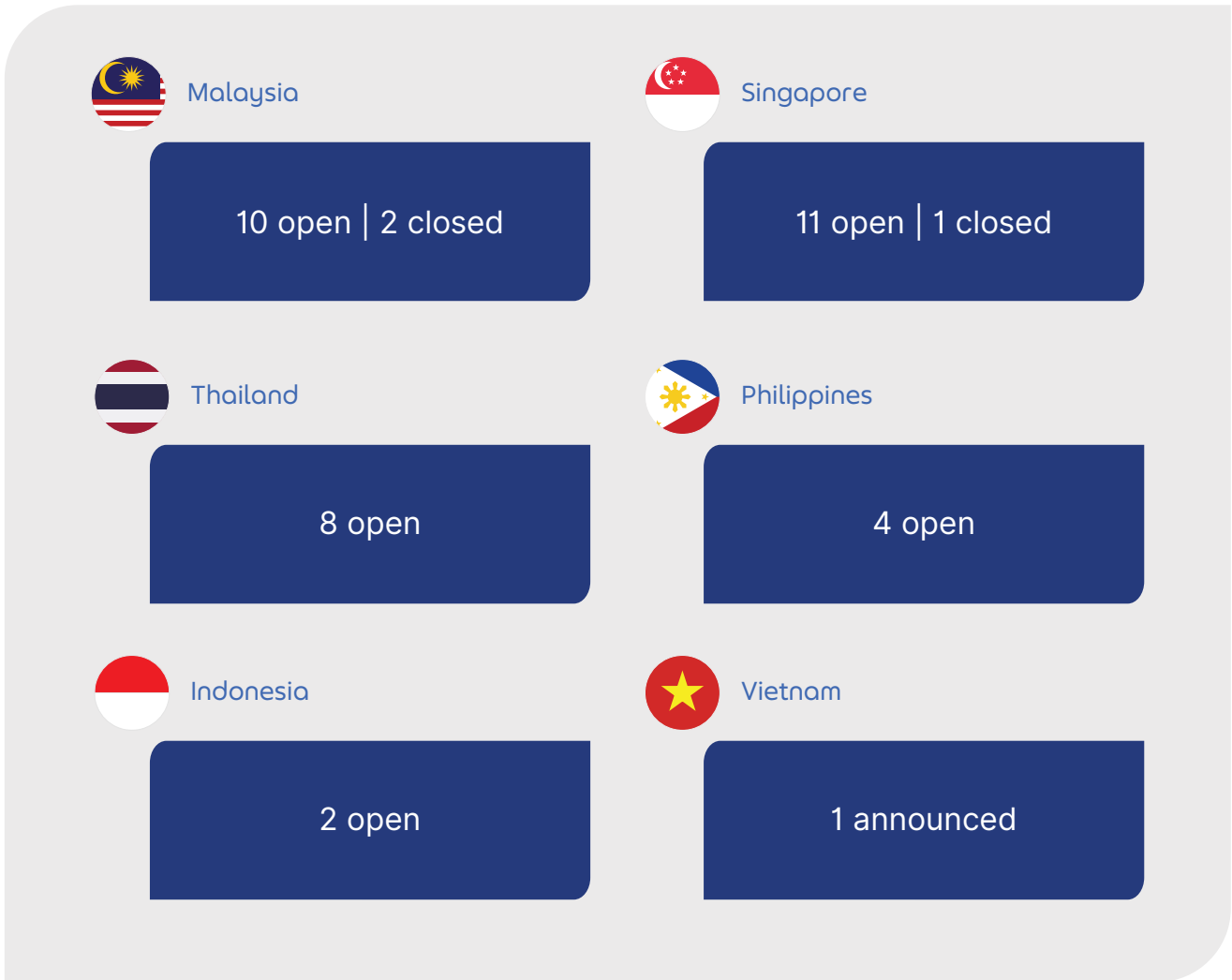
Figure 2. Status of Sandbox Initiatives in SEA-6



Source: Tech for Good Institute, 2023

All SEA-6 economies have either started implementing sandbox initiatives or have announced the intention to do so. Singapore and Malaysia have the most number of sandbox initiatives, including those that have closed. In Vietnam, a regulatory fintech sandbox has been announced and it is the first one in the country. This sandbox is expected to pilot six fintech solutions in the banking sector: grant of credit on technology platforms, credit scoring, application programming interface (API) data sharing, peer-to-peer (P2P) lending, application of blockchain and distributed ledger technology (DLT) in banking activities, and other technologies in banking operations and innovative business cooperation models in line with objectives of the sandbox.⁴²

Figure 3. Sandboxes by Country in SEA-6



Source: Tech for Good Institute, 2023

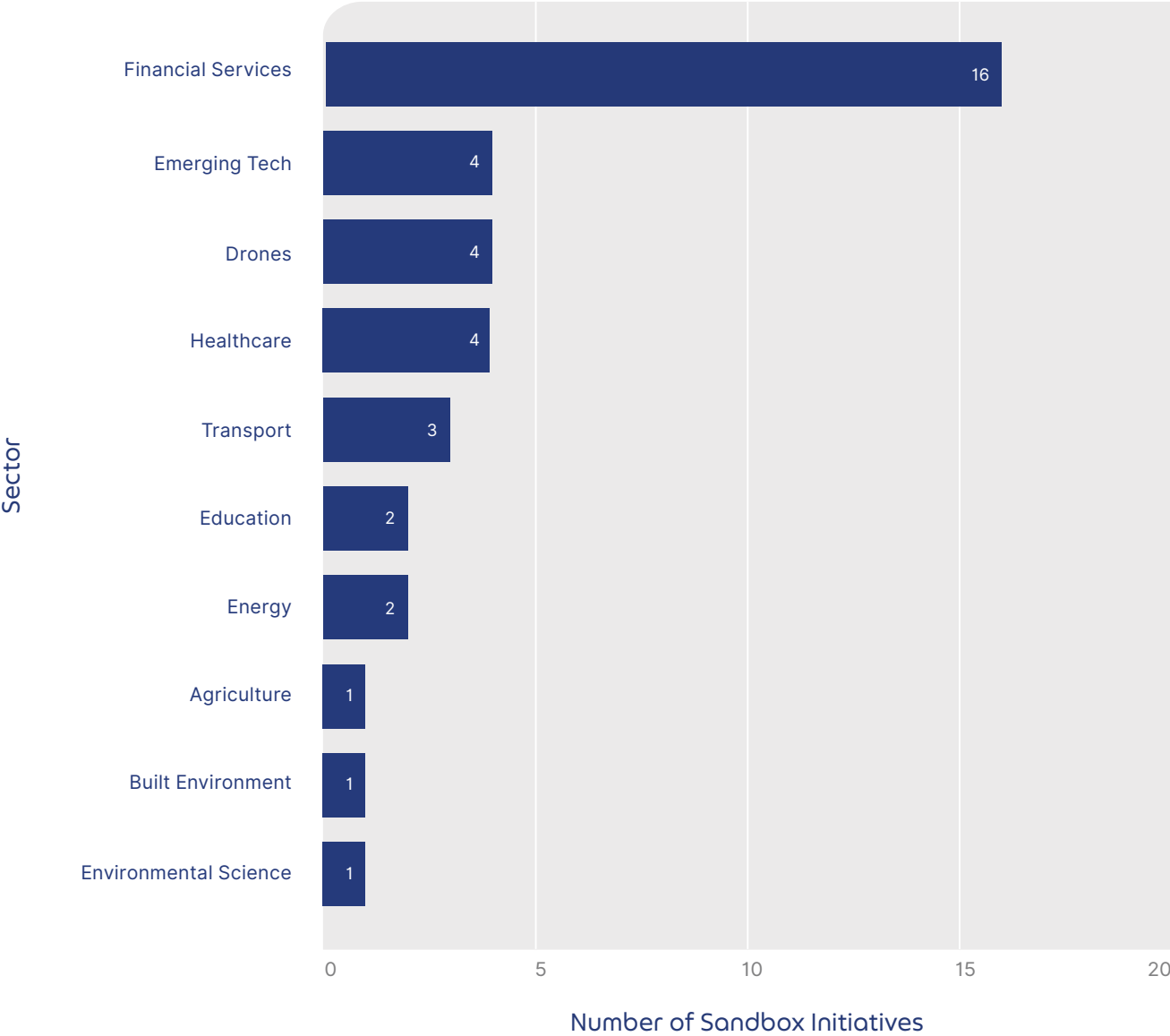
Across sectors

Regulatory sandboxes have gained the most traction in the financial services sector. To date, all SEA-6 countries have fintech sandboxes, except for Vietnam, in which the first fintech sandbox is still a work-in-progress.

One potential reason for the high number of fintech sandboxes in the region could be due to the immense growth in the sector. The fintech industry in Southeast Asia is booming, with investments in the region amounting to US\$4.3 billion in the first nine months of 2022, higher than the combined sum from 2018 to 2020.⁴³ Given this rapid growth, there is a pressing need for regulators to address potential risks of fintech products and services, whilst ensuring that they do not over-regulate to the detriment of innovation and sustained growth in the sector.

Another potential reason for the greater representation of the fintech sector in regulatory sandboxes in SEA-6 is due to policy learning from other jurisdictions. Regulatory sandboxes, initially introduced in the UK within the fintech space, continue to gain momentum globally, with fintech consistently emerging as the predominant sector for such initiatives.⁴⁴ As Southeast Asia begins to explore regulatory sandboxes, it makes sense to start with the fintech sector, where policy lessons can be drawn from other countries.

Figure 4. Sandboxes by Sector in SEA-6



Source: Tech for Good Institute and NUS Centre for Governance and Sustainability, 2023

With the continued digital transformation in the region, sandboxes in SEA-6 have branched out into many different sectors. Figure 4 offers an overview of the various sectors. These initiatives either focus on a specific industry (e.g. fintech, healthcare, energy and transportation), enable specific technologies with applications across various sectors (e.g. drones in Malaysia and Thailand), or take a thematic and multi-sectoral approach, such as Malaysia's National Technology and Innovation Sandbox (NTIS) or the Green Economy Regulatory Initiative (GERI) in Singapore.

As sandbox practices evolve in the region, notable trends emerge during its implementation across SEA-6 countries.

2.2. Key trends in Southeast Asia’s sandbox initiatives

As sandbox initiatives evolve in the region, a few trends are emerging in their implementation across SEA-6.

Variance in sandbox administration and implementation

Across SEA-6, there is a huge variance in sandbox frameworks across. For this study, we consider an initiative a sandbox when the market specifically brands it as such. Usage of the “sandbox” terminology could be a signal of a regulator’s priorities and intentions.

Not all countries are very clear with their sandbox guidelines. In some markets, regulatory sandboxes have clear eligibility criteria, evaluation frameworks, compliance requirements and exit procedures. In other markets, these rules and guidelines are not as clearly defined. Sandboxes in Singapore tend to be the most well-defined with clear guidelines, procedures and requirements, which are made publicly available on various regulators’ websites. In Malaysia, the BNM fintech sandbox guidelines are clear and well-defined, whereas those for other sectors are less so or are not made publicly available. Similarly, sandboxes in other jurisdictions in the region tend to be clearest for the fintech sector and relatively less developed in other sectors.

Differences in the nature of regulatory waivers

There are also differences in the nature of regulatory waivers for sandbox participants. While most sandboxes allow for relaxation of certain regulations during the testing period, this is not always the case. For example, Singapore’s Licensing Experimentation and Adaptation Programme (LEAP) by the Ministry of Health (MOH) in 2018 imposed more stringent requirements on participants.

This regulatory sandbox initiative enabled experimentation around new and innovative healthcare services while safeguarding public safety and welfare. The sandbox was part of a reform of the Private Hospitals and Medical Clinics Act, which included a shift from premises-based to service-based licensing. In the context of this reform, LEAP allowed MOH to closely collaborate with the industry to understand the risks of the new care delivery models early such as telemedicine and mobile medicine services, which were previously not regulated by MOH but were technologically ready for large-scale adoption.⁴⁵ These consultations contributed to the new Healthcare Services Act (HCSA) that are implemented in a phased approach, with telemedicine providers regulated at the end of 2023. MOH adopts a risk-based regulatory approach to healthcare services and focuses on licensing direct doctor and/or dentist-led teleconsultations under the HCSA.

The increased scrutiny within the telemedicine sandbox reflects the higher-risk nature of healthcare and the need to give public assurance that telemedicine would be piloted safely.⁴⁶ Despite these more stringent regulations, firms were keen to participate as they saw value in being the pioneers to grow the telemedicine sector, and recognised the need to co-create future regulations with the government.⁴⁷

Linkages to national strategy initiatives

While fintech sandboxes are common across all SEA-6 countries, other sandbox programmes reflect country-specific contexts and are often linked to broader national strategy initiatives and each country’s priorities and agendas. The Philippines, for example, has an agricultural insurance sandbox aimed at increasing insurance take up rates amongst farmers, reflecting the importance of the agricultural sector and recognising the disaster-prone nature of the country.

Malaysia has a sustained focus on drone and robotics sandboxes, in line with the Malaysian Drone Technology Action Plan 2022-2030 (MDTAP30), the national agenda to support the development of the drone ecosystem. Malaysia's drone industry has seen tremendous growth in the past few years, and is expected to reach a market value of up to RM 12.13 billion, or 4.3% of the global market share this year.⁴⁸ Malaysia is also the top Southeast Asian country in drone readiness, ranking 21st in the Drone Readiness Index, up from 30th in 2022.⁴⁹

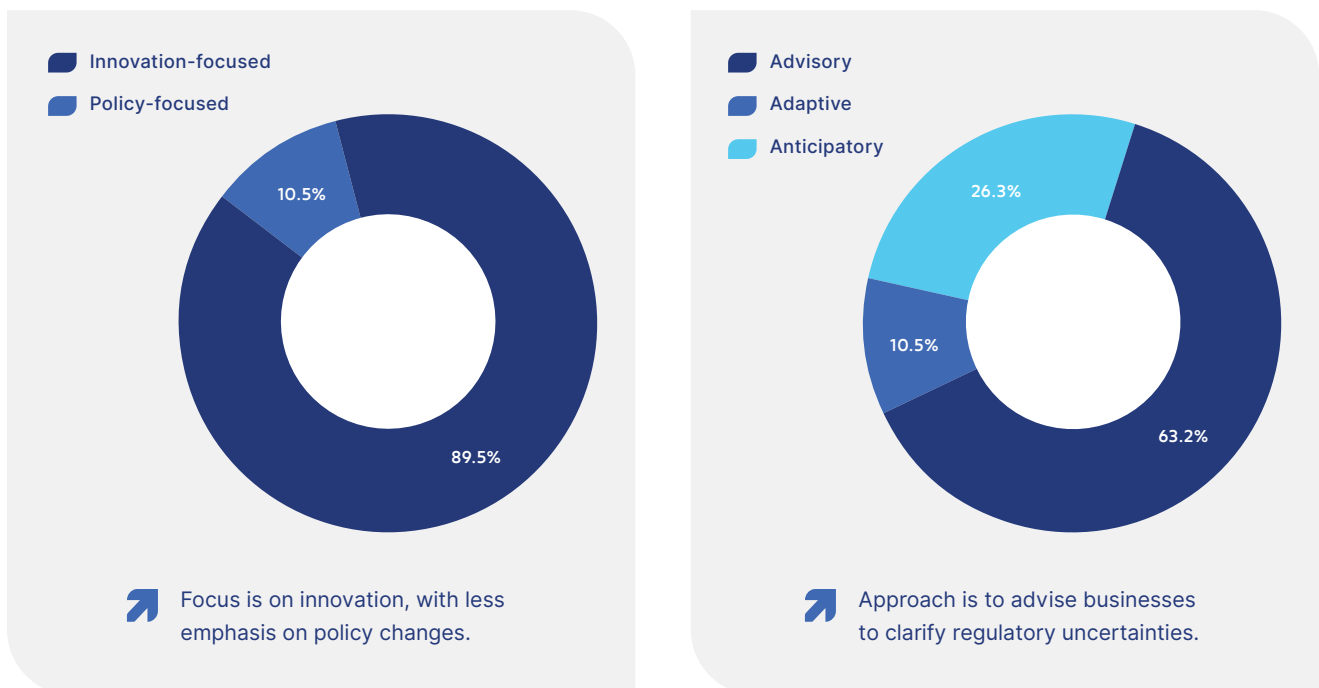
Singapore launched its privacy-enhancing technology (PET) sandbox in 2022, demonstrating the government's commitment to data protection while cementing its position as a regional technology hub. PETs refer to tools and processes that enable the sharing of useful insights extracted from data without disclosing the actual data. PETs could help address a company's data security concerns when sharing information and allow more opportunities for businesses to collaborate and for developing useful AI applications. While nascent, PETs occupy a sweet spot by allowing the extraction and sharing of insights and ensures the security and confidentiality of personal data.⁵⁰ The sandbox was thus launched with the intent of encouraging more widespread adoption of these useful technologies to foster trust in the digital ecosystem.

Additionally, Singapore launched the Generative AI Evaluation Sandbox for Trusted AI in October 2023.⁵¹ This reflects the rising adoption of generative AI and the intention of Singapore's regulators to have a standard approach in assessing the technology. There were 16 global generative AI players that participated in the sandbox, including AI developers, deployers and third-party testers. Through a research-based categorisation of existing evaluation methods and benchmarks, the sandbox aimed to provide an evaluation catalogue by compiling existing technical testing tools and recommending a baseline approach. The sandbox is expected to help identify current gaps in testing methods for generative AI and to develop models that are domain-specific and culture-sensitive.

2.3. The focus and approach of sandbox practices in SEA-6

SEA-6 sandboxes mostly focus on innovation and regulators tend to take an advisory approach. Sandboxes in SEA-6 tend to focus on fostering innovation and developing new products and services in specific sectors, with less focus on regulatory learning. The aim is to make it easier for innovators to work with regulators to test and adapt their product or service under existing regulations. One example is MAS’s fintech regulatory sandbox. Based on the sandbox guidelines published by MAS, the objective of the sandbox appears to be innovation-focused, to “encourage adoption of innovative and safe technology in the financial sector”,⁵² with no stated intention to consider revising existing regulations. This focus on innovation has reaped many success stories, some examples of which we will explore below.

Figure 5. Focus of Sandbox Practices in SEA-6



Source: Tech for Good Institute, 2023

In the region, relatively fewer sandboxes have been policy-focused, and policy changes from sandboxes are few. This could indicate a presently untapped opportunity for regulators to utilise sandboxes for regulatory learning and policy adaptation, particularly in dealing with emerging technologies where the attendant’s risks and opportunities are difficult to predict.

Notably, telehealth sandboxes in the region have been policy-focused. The first telehealth sandbox in the region was the Singapore Ministry of Health’s Licensing Experimentation and Adaptation Programme (LEAP). The findings contributed to the formulation of licensing requirements for

telemedicine under the Healthcare Services Act (HCSA). Malaysia took a similar approach to licence telehealth providers through its Online Health Service (OHS) Regulatory Lab, which closed its applications in 2022. The findings from the Regulatory Lab helped shape key guidelines and regulatory approaches for OHS in Malaysia. Most recently, Indonesia launched its telehealth regulatory sandbox in April 2023, where regulators took an adaptive approach similar to that of Singapore's and Malaysia's, with the potential development of "more specific policies and regulations in the field of data-based health technology".⁵³ In addition, Indonesia concluded its telehealth sandbox and recommendations for policy have been submitted to the Ministry of Health at the end of 2023.

One possible reason for the limited policy outcomes of sandboxes is that the region is young in terms of sandbox development. While fintech has had a head start, other sectors are still in the early stages of experimenting. Generally, SEA-6 countries only started launching sandboxes from 2016 onwards. Vietnam's first sandbox is still in its initial stage. Nonetheless, there is indication that some sandboxes in the region could be leading to policy outcomes. One example is Malaysia's NTIS, which partners with the Civil Aviation Authority of Malaysia (CAAM) to share valuable insights on drone regulations.⁵⁴ NTIS's goal is to open a new channel for ecosystem players and operators to share their thoughts and feedback on the regulation and directive for UAS and drones. Moreover, Singapore's PET sandbox, launched in July 2022, has a clear policy focus, aside from its goal of supporting industry adoption of PET solutions. The regulators of this sandbox, the Infocomm Media Development Authority (IMDA) and Personal Data Protection Commission (PDPC), draw on the lessons learned from the sandbox to set standards and best practices for PET providers and users.⁵⁵

Even in jurisdictions outside of SEA where sandboxes are relatively more mature, policy changes have been rare, except where it is a core purpose of the initiative.⁵⁶ For example, the Hong Kong Monetary Authority (HKMA) updated its supervisory guidance on biometric authentication and remote account onboarding in light of tests conducted by banks participating in the sandbox. Similarly, the Australian Securities and Investment Commission (ASIC) developed its guide on crypto-assets based on learnings derived from sandbox trials and conversations with companies through the innovation hub. The relative scarcity of regulatory adaptations could reflect the inertia against regulatory change, or could be indicative of more flexibility under existing regulatory frameworks, and therefore less of a need for regulatory change than is realised.⁵⁷

Some sandboxes for emerging technologies have taken a more anticipatory approach.

Autonomous vehicle (AV) testbeds involve the coordinated actions of regulators, local authorities, research institutions and technology companies. For example, Singapore's Autonomous Vehicle Initiative created a cross-industry committee with public and private sector members to oversee integration of AVs after the Land Transport Authority (LTA) gave greater flexibility around transport laws to test AVs on public roads. A collaborative research centre was also created to test and improve AV technology in both a live and laboratory environments.⁵⁸

In addition, Malaysia's NTIS appears to be taking an anticipatory approach in many respects, most notably with its drone industry dialogues with the Civil Aviation Authority of Malaysia (CAAM). NTIS works closely with CAAM to ensure safety and regulatory compliance in several sandbox programmes, and on requirements and procedures for the organisation of remote pilot training, agriculture drone operations and facilitation of several unmanned aerial vehicle projects.⁵⁹ Following drone tech industry dialogues with the NTIS in 2021, CAAM launched three civil aviation directives to address risks and security issues in drone operations.⁶⁰

The same anticipatory approach can also be observed in Singapore's generative AI sandbox.⁶¹ The sandbox employs a research-based and collaborative approach to developing an evaluation method for generative AI. It aims to build evaluation capabilities on top of what is already being employed by developers, deployers and third-party testers. Where possible, use cases of generative AI would include an upstream model developer, downstream application deployer and a third-party tester to better understand what key parameters should be used to test generative AI on.

Impact stories: From sandbox to society

There are key success stories of businesses that have participated in sandbox initiatives and have fully exited the program in Southeast Asia.



Doctor Anywhere

Doctor Anywhere is a telehealth platform that provides video consultations with medical doctors and healthcare professionals through a mobile app. Since participating in MOH's LEAP from 2018 to 2021, Doctor Anywhere has seen exceptional success and has firmly established itself as a regional leader in healthcare. The company ranks third in The Straits Times' league table of the fastest-growing companies in Singapore, with an absolute growth rate of more than 10,000%.⁶² Its revenue has grown significantly since expanding other countries in the region, and doubling its user base in 2022 from 1.25 million users to about 2.5 million by the end of the year.⁶³ The company also recently acquired Catalist-listed Asian Healthcare Specialists, an integrated healthcare provider, and secured an additional \$38.8 million in funding in its latest Series C1 financing round.



MoneyMatch

MoneyMatch is a fintech startup, enabling cross-border international payments and remittances. In 2019, it became the first graduate of Bank Negara Malaysia's regulatory sandbox, having pioneered the use of eKYC solutions in the cross-border payments space.⁶⁴ Since then, MoneyMatch has broken the boundaries in conducting cross-border transactions over blockchain and expanding overseas to Australia and Brunei.⁶⁵ In mid-2022, MoneyMatch participated in the consortium led by KAF Investment Bank, which was granted a digital banking licence under the Islamic Financial Services Act to work towards building one of the first Islamic digital banks in Malaysia.⁶⁶



NestiFly

NestiFly is Thailand's first licensed P2P lending platform. It exited from the Bank of Thailand's regulatory sandbox and was issued its business licence on 22 April 2022. NestiFly is an alternative credit service provider with low-risk collateral securities, filling a gap in the market for the financially underserved who face difficulty in accessing finance from mainstream banks.



3. Moving Forward: How Sandboxes May Foster Innovation

Regulatory sandboxes present an opportunity for regulators and innovators to work closely together, learn from each other and jointly create a robust and thriving digital ecosystem. Southeast Asia is well positioned to benefit from regulatory sandboxes, with governments demonstrating an interest in exploring regulatory innovation. Based on our scanning of Southeast Asia's sandbox frameworks, we have identified a few key recommendations, both for regulators and business, to enable growth and maturity in the region's sandbox practices.

3.1. For regulators

First, creating clear and transparent sandbox guidelines, as well as explicit articulation of the sandbox's objectives from the outset, can help set regulators and businesses up for success.

These guidelines and objectives should be made publicly available in the interests of transparency, for instance, on the regulator's website.

As for the sandbox guidelines, these should include

- a. the objectives of the sandbox,
- b. the eligibility criteria for participating in the sandbox,
- c. compliance requirements for the duration of the sandbox period, and
- d. entry and exit procedures and requirements.

a. Objectives of the sandbox

In terms of objective-setting, regulators should be clear whether the sandbox is innovation-focused, policy-focused or both, and whether the regulator is open to regulatory change or not. This way, participants can manage their expectations and determine whether the sandbox

is suitable for them. For instance, if regulators express an openness to regulatory change and adaptation, this could draw more industry participants who are keen to influence and shape policymaking.

b. Eligibility criteria

Some examples of eligibility criteria may include the following:

- Businesses seeking to participate in a regulatory sandbox must typically demonstrate that their product is genuinely innovative. This could be through deploying an emerging technology, or a new and innovative way of using an existing technology.
- Sandbox applicants are also generally required to show that their product has an identifiable consumer or social benefit. Applicants may be required to demonstrate that their product or business model addresses a problem or brings benefits to consumers or the industry at large.
- Sandboxes are typically only open to products and concepts for which there is an existing regulatory gap. This gap may be due to outdated regulations that are not fit-for-purpose, or in some cases, lack of regulation due to the relative nascency of the technology, or proposed product or service. For instance, this may involve identifying a particular regulatory requirement that constrains the activity of the firm, enabling the regulators to identify innovative models that may operate within the current regulatory framework.⁶⁷ This requirement ensures that the regulator is not overburdened by businesses that lack a genuine interest to participate in the sandbox.

c. Compliance requirements during the sandbox period

Sandboxes should have defined limits and safeguard mechanisms. These limits are usually temporary, meaning sandboxes allow for live testing of the products for a limited duration, which typically ranges from 6 to 24 months.⁶⁸ In addition, sandboxes may impose safeguard mechanisms to protect consumers and to ensure that any risks posed by the innovations are contained and mitigated. These may include limits on the number of customers or value of services offered, additional reporting obligations, closer monitoring, strict minimum standards, and additional consumer protection or risk mitigation measures.

d. Entry and exit procedures

Sandboxes should have clear procedures, from entry to exit. Regulators should clearly communicate the various procedures and steps that participants must take throughout the sandbox process, including paperwork that needs to be submitted in applying for the sandbox, the interim reports that have to be submitted for monitoring during the testing period and the exit procedures once the testing period is over. For example, this could take the form of sandbox guidelines or an FAQ page, akin to the approach adopted by MAS in the past sandboxes.

Second, ensuring greater transparency and sharing of lessons learned through sandboxes is crucial to further foster regulatory learning. As sandbox programmes are relatively nascent in the region, there is much to gain by sharing lessons, insights and best practices to enable sandbox administrators and participants to learn from others' mistakes. By sharing insights from the sandbox with the wider community through other channels, such as advice centres or published reports, other businesses outside of the sandbox can benefit from the lessons learned, in addition to the sandbox participants. This could partially alleviate the risk that sandboxes create an uneven playing

field. One good example of regulators sharing insights is through the UK FCA's *Regulatory sandbox lessons learned report*, which shared some of the key takeaways and lessons from the first year of administering the fintech sandbox.⁶⁹

Third, an anticipatory approach should be taken when establishing sandboxes for emerging technologies. While many sandboxes in the region have taken an advisory approach, an anticipatory approach may be more suitable for emerging technologies where the risks and opportunities surrounding the technology are not yet known. Building an information and evidence base through research and collaboration between academia, industry, civil society and the government can help everyone identify potential threats, issues and opportunities around such technologies. Continuous feedback loops and ongoing engagement between stakeholders across different sectors and industries should also be prioritised in an anticipatory approach.

Fourth, regulators can consider taking a multi-sectoral approach to sandbox implementation, facilitating innovation in digital technologies as a horizontal cut across industries. One example is Malaysia's National Technology and Innovation Sandbox, which facilitates tech innovation across various sectors including agriculture, education, transport and more. Such an approach enables sharing knowledge among numerous regulatory bodies and more efficient regulatory processes for businesses to approach a single point of contact instead of having to search for the correct regulator for their business.

Finally, there is an opportunity for regulators to coordinate with regulators from other jurisdictions to implement "sandbox corridors". This would support a firm's cross-border movement and operations whilst encouraging regulator cooperation and reducing regulatory arbitrage. This is particularly important in the context of the increasingly borderless digital economy. One example of this is ASEAN's Regulatory Pilot Space (RPS) which GSMA helped to launch in 2019. Its intention was to provide businesses with a test environment for cross-border data transfer, without facing sanctions or breaking privacy rules.⁷⁰ While RPS was announced in late 2019, updates on its operationalisation and progress have been limited, perhaps indicating that there is space for member countries to prioritise and fast-track its implementation.

3.2. For businesses

The private sector should have a collaborative attitude and be open to sharing their tech and data in order to inform policymakers, extend knowledge, skills and resources. Many areas of the digital economy are not zero-sum games - there is often plenty of room for several winners. Without collaboration, businesses risk delaying breakthrough discoveries, overlooking new markets and missing out on cost savings by duplicating efforts.⁷¹

Related to our recommendation for regulators to establish a platform for knowledge sharing, participating businesses also have a responsibility to actively contribute their learnings from the sandbox process to such platforms. As much as regulators can facilitate knowledge sharing and provide their own insights and learnings, it is equally important to get the perspective of participating companies in order to provide a holistic view of the entire process.

And finally, to facilitate sandbox participation, internal coordination within companies may be necessary, particularly for larger companies. This could entail the formation of a dedicated team with multiple stakeholders from business, product, legal and public policy teams, to ensure internal alignment for more efficient and effective participation in the sandbox.

3.3. Areas for further research

While this landscape study has provided a high level view of the sandbox practices in Southeast Asia, there are many further opportunities for research to deepen the understanding of policy innovation in the region.

There is an opportunity for deeper research into best practices and common pitfalls in Southeast Asia. A draft model sandbox framework could also be developed to support regulators and to ensure that sandbox frameworks across the region are robust, clear and transparent.

Next, we highlighted at the start of this paper that regulatory sandboxes are just one form of policy innovation. Similar landscape studies could be conducted for other forms of regulatory innovation in the region, for example, outcome-based regulation or dynamic regulation. Taken collectively, such research can inform how emerging technologies or business models may be governed most effectively across different jurisdictions in Southeast Asia.

And finally, while this paper has focused more on domestic sandboxes, more research could be directed to better understand the challenges and intricacies of cross-border sandboxes, and the key drivers and enablers to realising an actionable cross-border sandbox for testing across the region. As noted above, ASEAN had launched its RPS in 2019, but little news has been released on its progress or implementation status. Further deep diving into the status of RPS and the main hurdles of its implementation and adoption by member states could be fruitful.

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