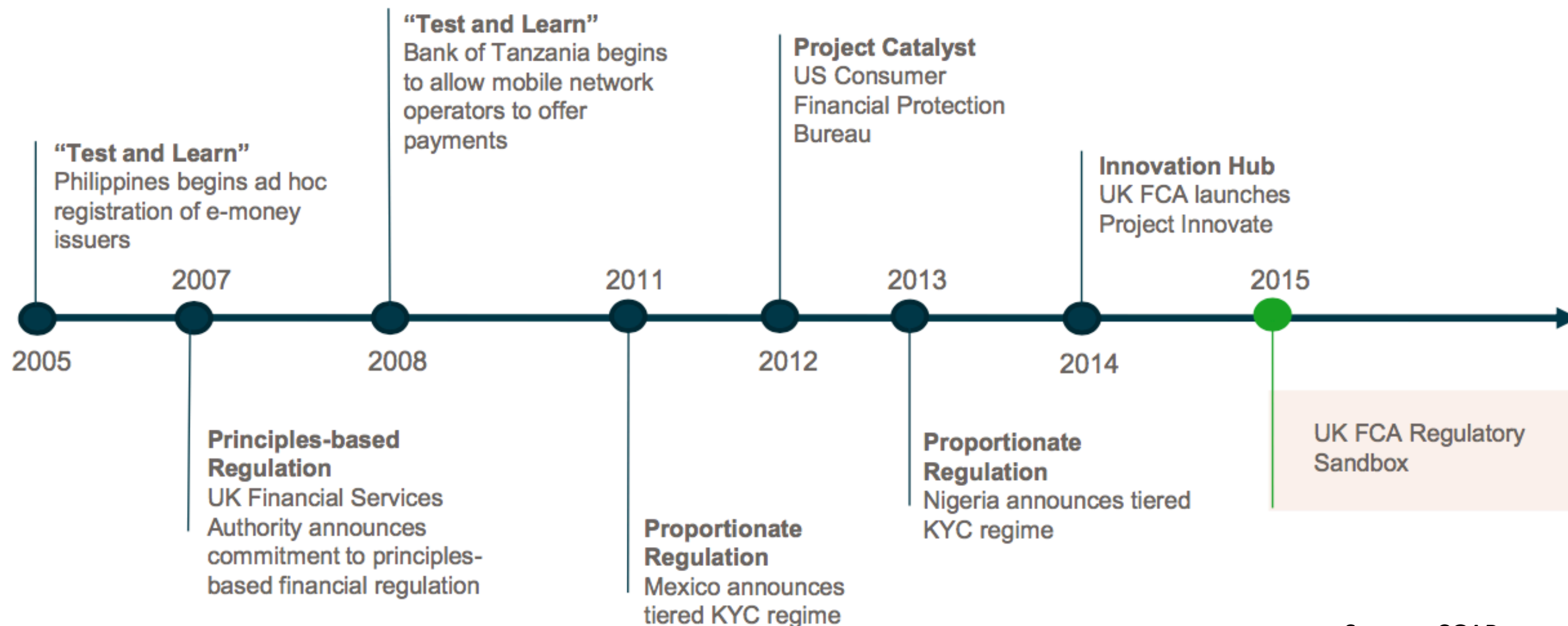


2. RegTech

We cover this in the next workshop this afternoon!

Test & Learn as a Pre-cursor to Sandboxes



Source: CGAP

Bangko Sentral ng Philipinas

2004

Permitting non-banks to pilot e-money with safeguards and reporting requirements in place



2009

E-money regulations adopted



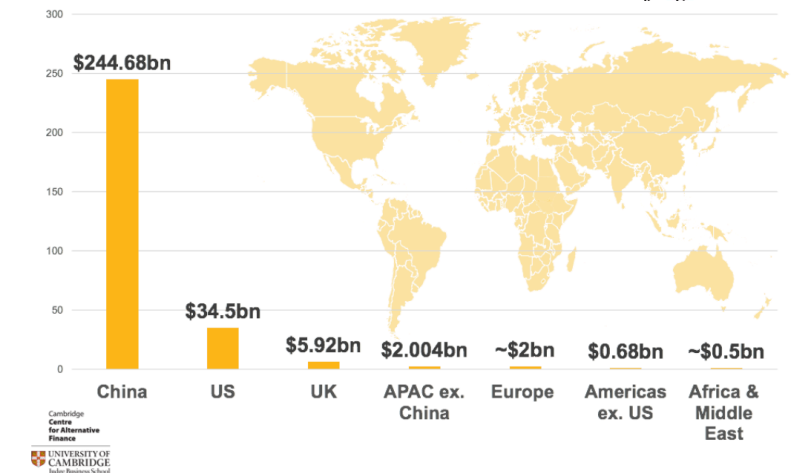
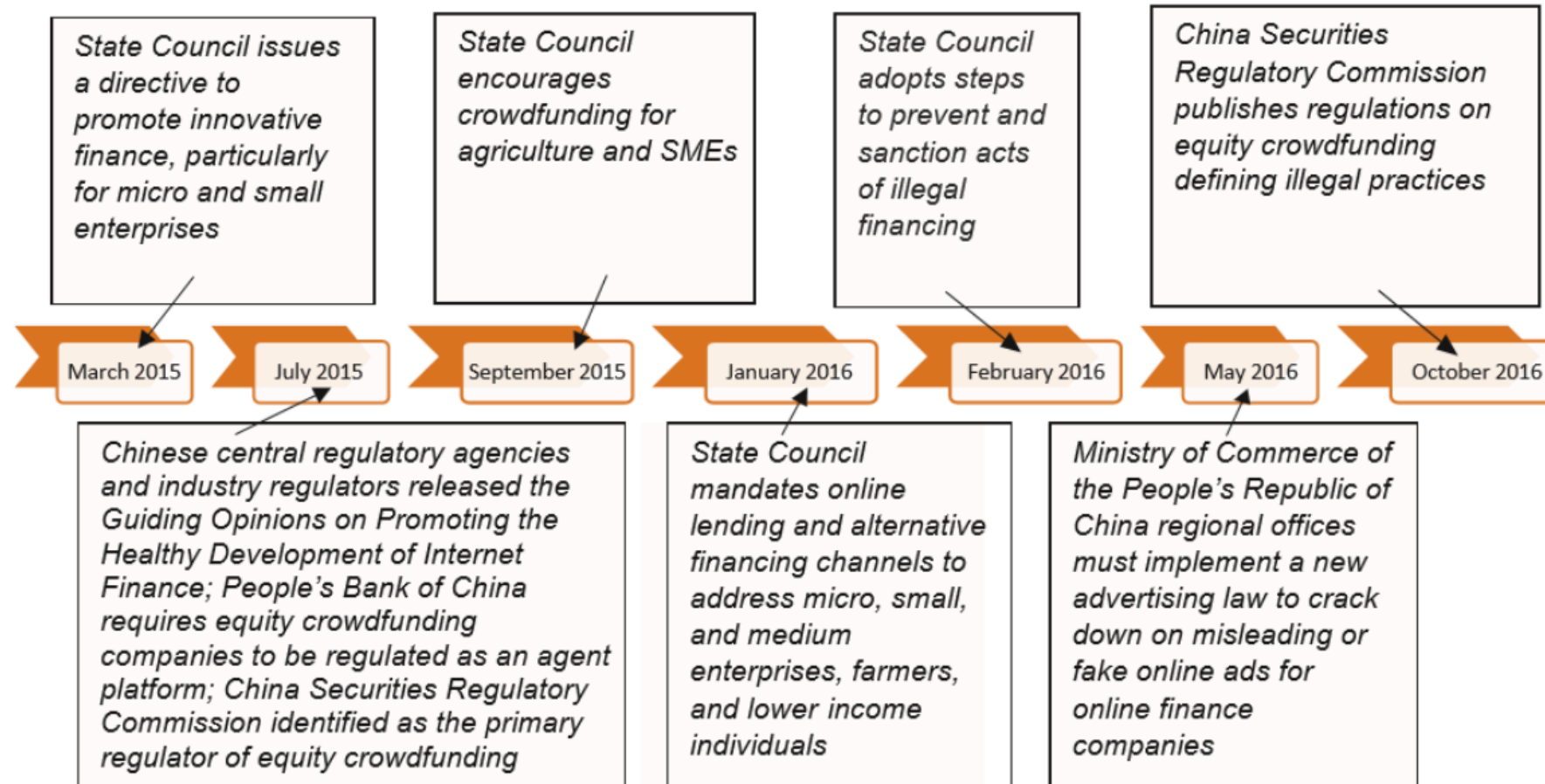
Today

T&L approached used to test various innovations from payments agents to e-KYC

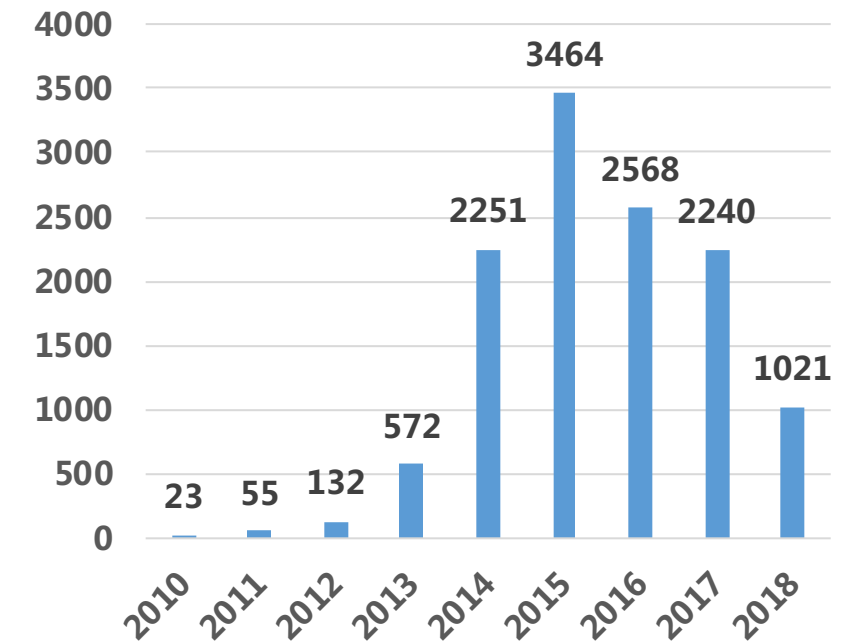
Test & Learn as a Pre-cursor to Sandboxes

P2P Lending in China

Examples of policy interventions



P2P Lenders in China



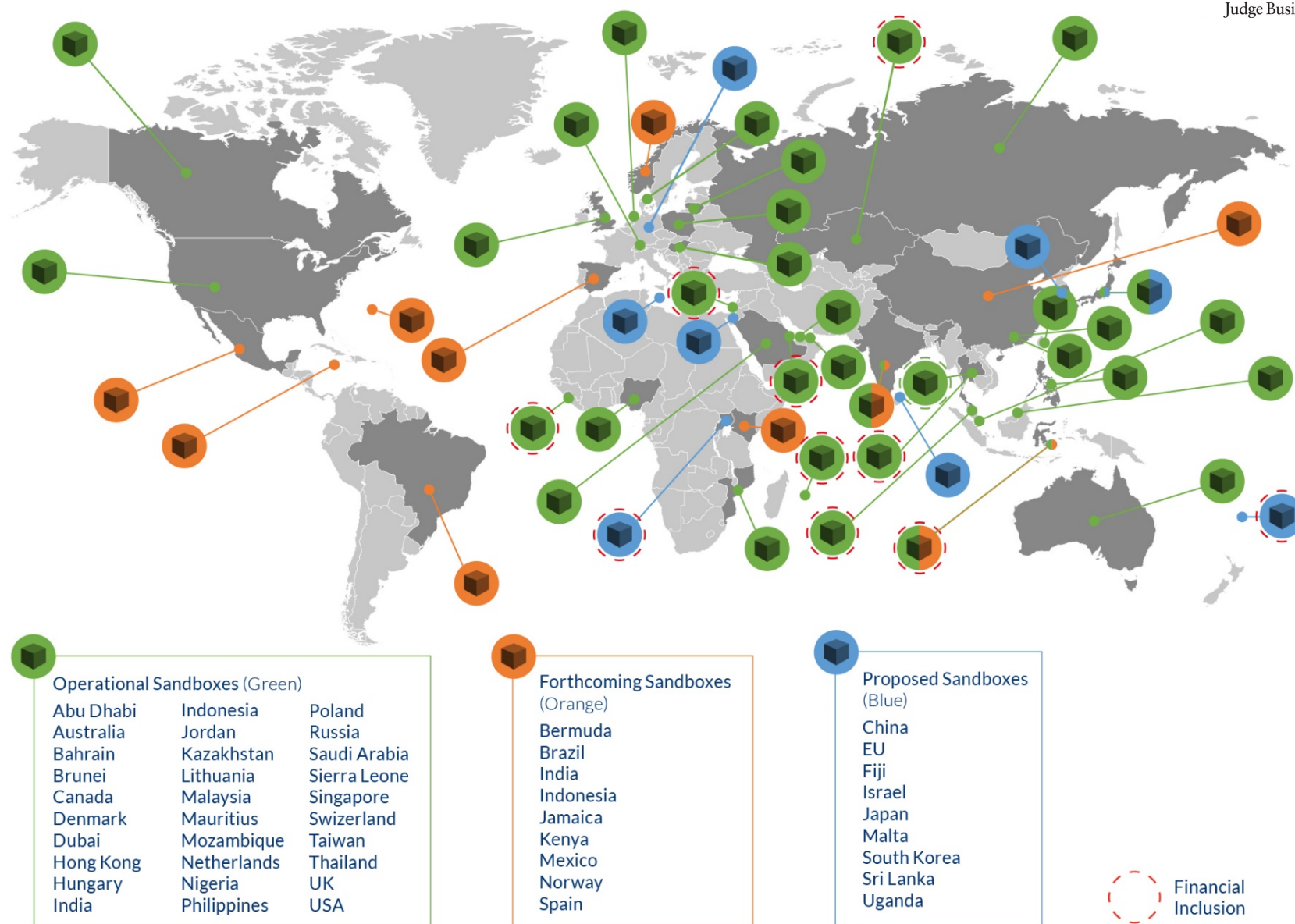
Approaches to Sandboxes



Regulatory Sandboxes: A Global Phenomenon

Regulatory Sandboxes:
'Formal regulatory programs for market participants to test new financial services or models, with live customers, subject to certain safeguards and oversight.'

Regulatory sandboxes are now live or planned in over 50 jurisdictions, with several including a financial inclusion emphasis.



Sources: European Supervisory Authorities (2019), Jenik and Lauer (2017), Mueller et al. (2018), DFS Observatory (2018) and UNSGSA FinTech Working Group and CCAF (2019)

A formal regulatory initiative:

- ...to live-test new products, services, or business models ...
- ... on a time- and scope-limited basis ...
- ... in order to determine the appropriate regulatory treatment or status ...
- ... to safely operate in the marketplace on a going forward basis.



Learner's Permit



Clinical Trial

A sandbox is not:

- a permanent license to operate;
- a “free pass” to operate without regulatory oversight or supervision;
- required when the regulatory status of an innovative product can be determined without live testing in the marketplace;
- a venue for testing the viability of new business models or attracting new customers.



Approaches to Sandboxes: What is New?

	(liberal)	Test-and-Learn (bespoke)	FinTech License (legislative)	Regulatory Sandbox
Structured (a defined process to deal with innovations)			X	X
Permanent (a permanent framework)			X	X
Objective-driven (implementation driven by defined objectives)			X	X
Open access (objective and transparent criteria determine access)			X	X
Parametrized test (restrictions and safeguards in place)		X		X
Mutual learning (intense dialogue between the regulator and innovators)		X		X

Innovation Promoting:

- Product testing Sandboxes, safe zone to allow innovators to live-test new products prior to formal licensing or registration.
- Gain feedback on service or business model, assess consumer uptake, refine product features

Policy Promoting:

- Evaluate regulations or policies that may impede beneficial new technologies or business models.
- Evaluate a specific regulatory hypothesis, i.e. if a specific rule or regulation should change given test result. E.g. MAS

Thematic:

- Sandboxes may be used to develop an enabling environment for financial innovation, based on certain themes.
- Tool for regulators to collaboratively engage in marketplace innovation, investigate the risks and benefits of technology,
- Develop long-term policy from a more informed position. Thematic sandboxes e.g. (eKYC), QR codes, and MSME finance.

Multi-jurisdictional and multi-authority sandboxes:

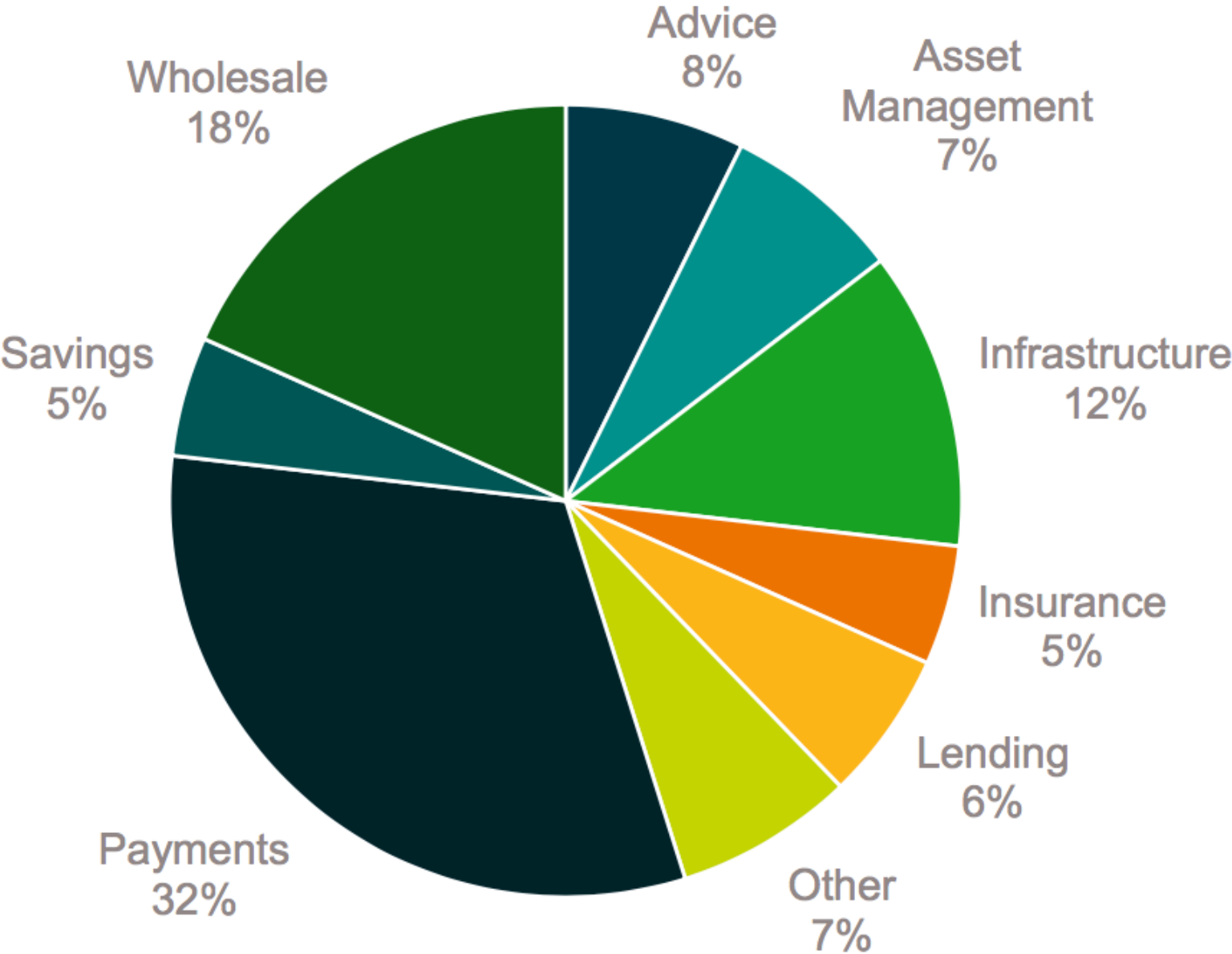
- To promote cross-border regulatory harmonization
- enable innovators to scale more rapidly on a regional or global basis.
- National or even regional markets may be too small to deliver a financially viable solution
- Multi-jurisdictional shared testing programs can also reduce the potential for regulatory arbitrage (EBA, 2018b).

Some Implications of Approaches

Source: CGAP

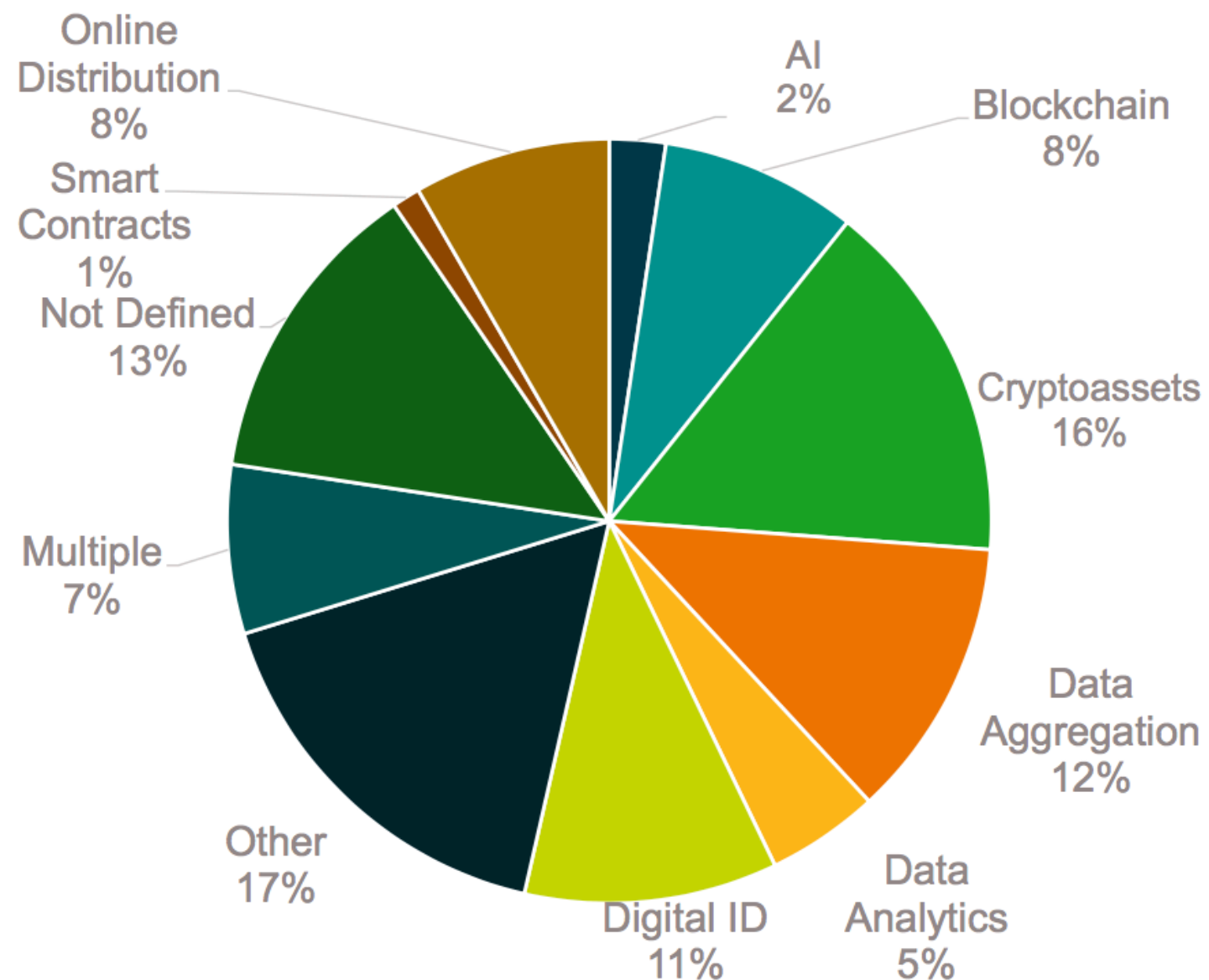
	Innovation-promoting Sandbox	Policy-promoting Sandbox	Thematic Sandbox
Objective	<ul style="list-style-type: none"> • Market development • Regulatory learning 	<ul style="list-style-type: none"> • Identify regulatory blockers to beneficial innovation 	<ul style="list-style-type: none"> • Develop evidence to support regulatory enablers • Targeted market development
Capacity	<ul style="list-style-type: none"> • Process & manage large cohorts • Informal guidance & feedback 	<ul style="list-style-type: none"> • Facilitative regulatory architecture 	<ul style="list-style-type: none"> • Clear thesis on regulatory or policy objectives
Eligibility	<ul style="list-style-type: none"> • FinTechs + Incumbents • Regulatory uncertainty • Potential consumer benefit 	<ul style="list-style-type: none"> • FinTechs + Incumbents • Regulatory barrier • Compelling consumer benefit 	<ul style="list-style-type: none"> • FinTechs + Incumbents • Hypothesis on industry-wide issue • Normative view of market direction
Complimentary Programs	<ul style="list-style-type: none"> • Innovation Hub/Office 	<ul style="list-style-type: none"> • Facilitative & strategic regulatory environment 	<ul style="list-style-type: none"> • ASIC (Australia)
KPIs	<ul style="list-style-type: none"> • Number of new firms to market 	<ul style="list-style-type: none"> • Policy change • Approval of new entrants previously prohibited by legacy rules 	<ul style="list-style-type: none"> • Guidance or rule change on key enablers • Growth of targeted sectors or business models

Regulatory Sandboxes: Area of Innovation in FS Tested to Date



Surprising?

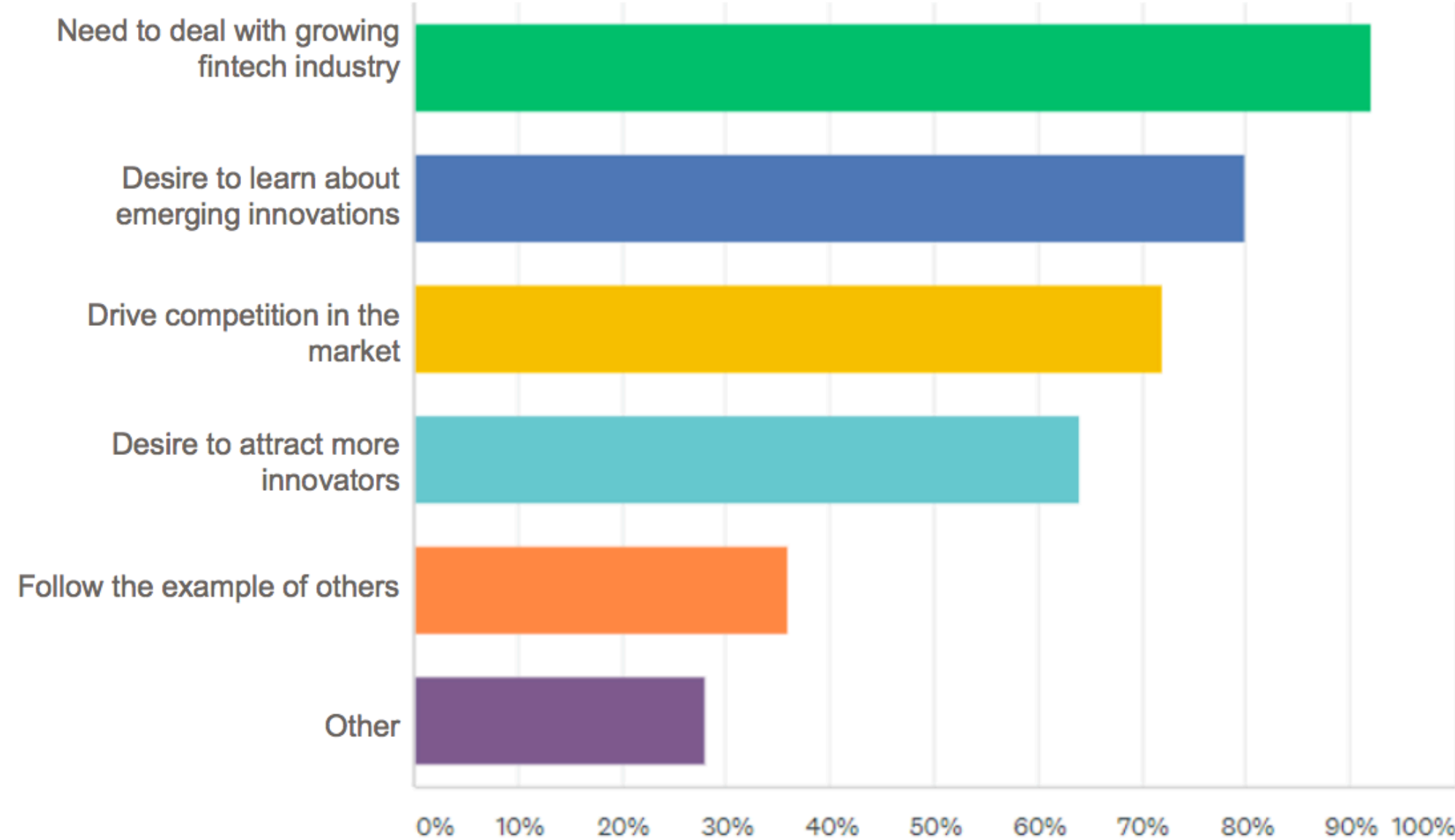
Regulatory Sandboxes: Types of Technologies Tested To Date



Benefits and Risks of Sandboxes

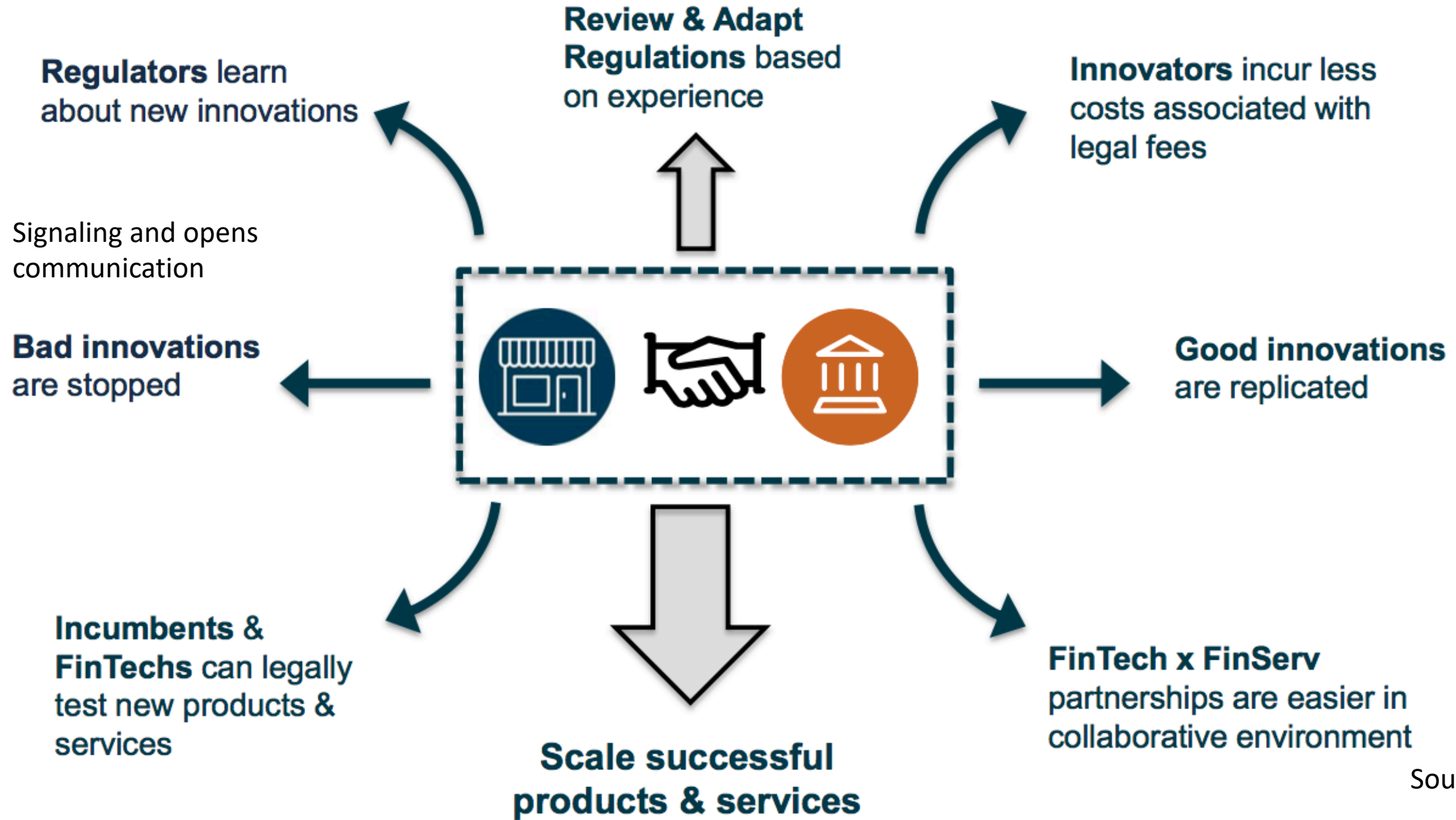


Reasons Regulators are using Sandboxes



Source: CGAP

Benefits of Sandboxes



- Stretching regulatory capacity – expensive (\$1M/Year)
- Regulatory procrastination
- Inadequate institutional arrangements
- New risks associated with products and services
- Disproportionate distribution of benefits to already included segments
- Competition issues (winners picking, uneven playing field)
- Limited capacity of regulator to run sandbox
- Liability issues in case of failed testing
- Fragmentation of regulatory regimes nationally and internationally
- Coordination issues

Sandbox Feasibility Assessment



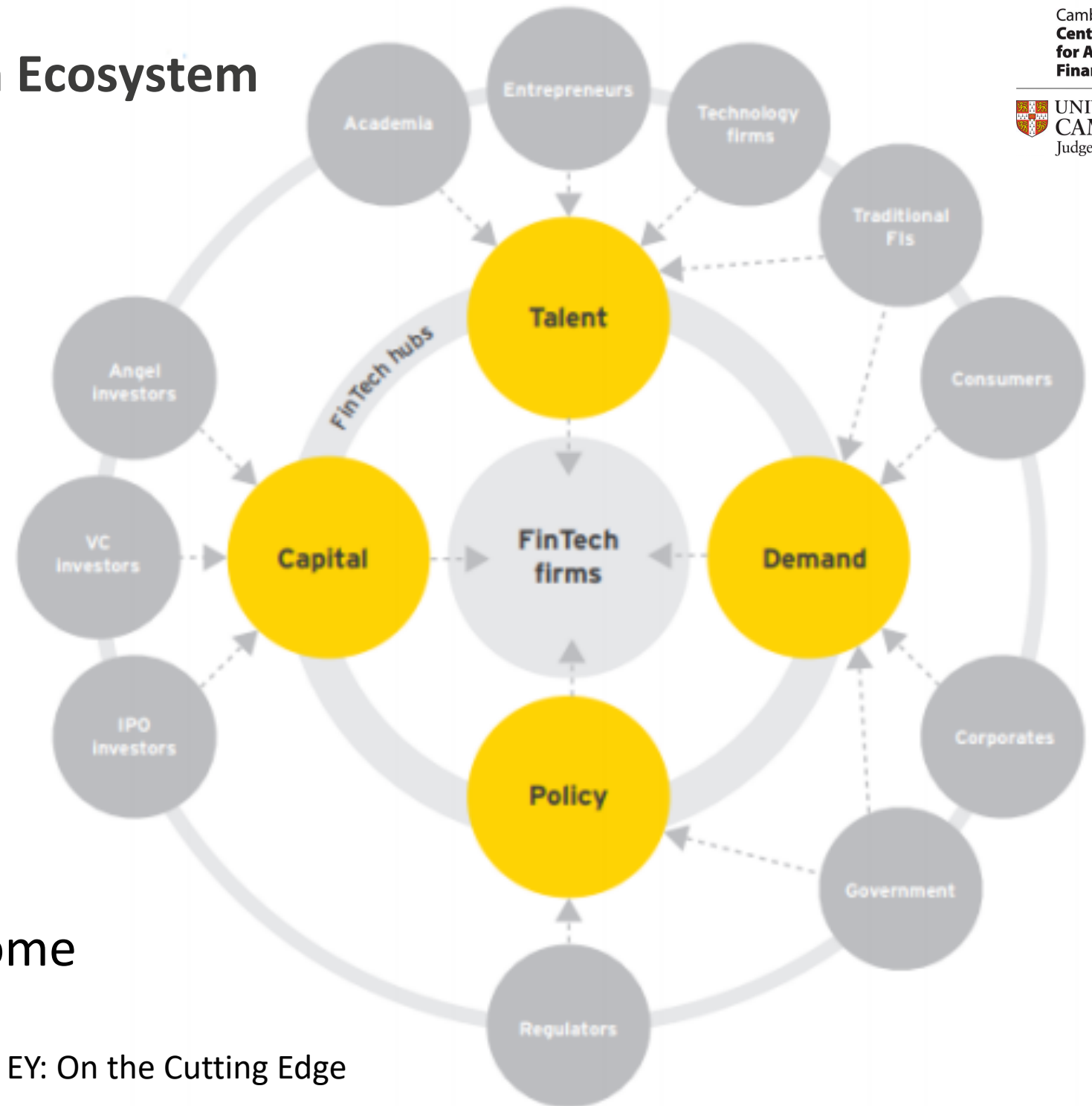
1. Sandboxes are only **one of many tools** for engaging with innovation – consider all options
2. Sandbox models are evolving to **local context** and expanding to **multi-jurisdictional** settings
3. Before implementation, assess **feasibility** and **consult with stakeholders**

Sandbox Feasibility Assessment

	1	2	3	4	5
	Objective	Legal	Demand	Capacity	Champion
What	<ul style="list-style-type: none"> National objectives <ul style="list-style-type: none"> ✓ Financial inclusion ✓ Competitiveness Regulatory objectives Success metrics 	<ul style="list-style-type: none"> Statutory Mandate Regulatory relief Other considerations <ul style="list-style-type: none"> ✓ Regulatory coordination ✓ Intellectual property 	<ul style="list-style-type: none"> What does the market want? What does the market need? 	<ul style="list-style-type: none"> Dedicated vs. shared staff Technical skills Inter-departmental External experts 	<ul style="list-style-type: none"> Executive sponsor(s) Governance structure
Why	<ul style="list-style-type: none"> Avoid “shiny objects” Link to policy goals Establish strategic direction 	<ul style="list-style-type: none"> Clarify legal constraints and regulatory outputs Confirm sandbox is NOT an accelerator 	<ul style="list-style-type: none"> Identify alternative & complimentary programs Begin dialogue with market participants Avoid risk of low uptake 	<ul style="list-style-type: none"> Form & scope Related programs Account for activity adjacent to the sandbox 	<ul style="list-style-type: none"> Affirm institutional commitment Endorse cultural change Encourage some level of regulatory risk taking
Fact*	Learning about the emerging FinTech sector is the top objective (90%) reported by sandbox sponsors	Most sandboxes graduate participants into an existing licensing regime	Innovation hubs have hosted 1,348 participants vs 164 in sandboxes	78% of all sandboxes draw from existing internal resources (i.e., not dedicated)	87% of sandboxes have governor or board-level sponsorship

Source: CGAP

Stakeholder Engagement: FinTech Ecosystem



- Do Call for input
- Do Public Consultation
- Do consult widely
- Don't build it and hope they come

Source: EY: On the Cutting Edge

Sandbox Stakeholder Engagement

Market Participants

(incumbents, FinTechs, others)

- Identify market perceptions
- Expand knowledge base
- Define scope and use case

Intra-Regulator

- Identify detractors and champions
- Highlight practical considerations
- Begin buy-in and culture shift

Inter-Regulator

- Identify detractors and champions
- Highlight practical considerations
- Multi-perimeter concerns

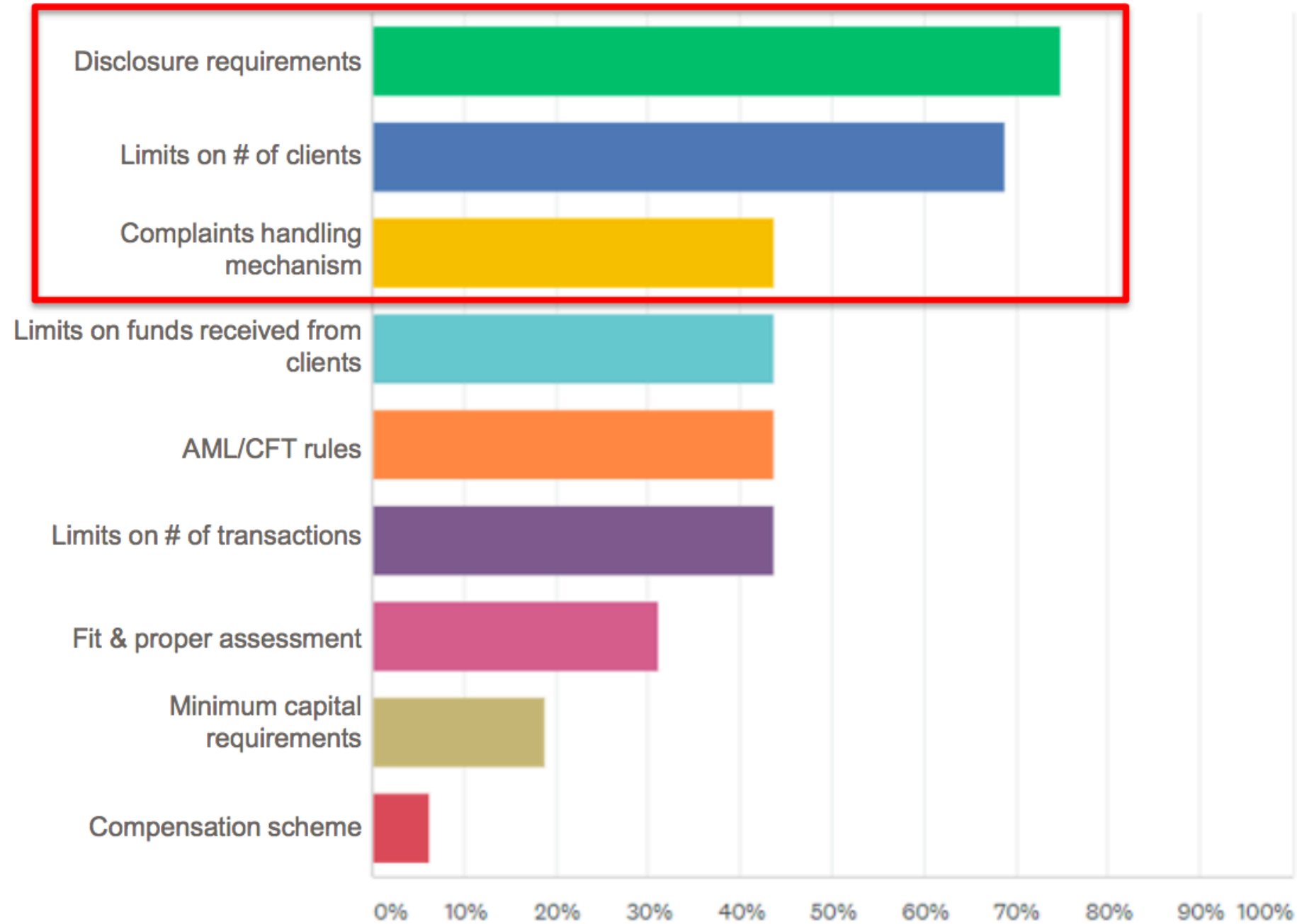
Rationale

- Contextualization (not all sandboxes are the same)
- Useful information and process even if it doesn't recommend a sandbox
- Identify potential alternative and complimentary programs (i.e., hubs, thematic sandboxes)
- Mitigate risk of low uptake

Conceptualising a Regulatory Sandbox



Sandbox: Typical Design Features



Some Key Sandbox Parameters (non-exhaustive)

Parameter	Detail
Disclosure Requirements	Additional disclosure may be needed from participating firms to ensure consumers know the risks involved in engaging with a sandbox.
Limiting number of clients	Sandboxes are usually designed for small scale testing with strict limits on the number of participating customers. The total number of customers should be sufficient to enable the collection of enough data, whilst also mitigating risks
Complaints handling	Sandbox participants should ensure they have appropriate complaints handling processes in place, and consumers should be able to raise a complaint against the firm.
Limits of funds	For testing firms, limits on the total amount of funds and number of transactions that can be processed can be put in place to limit the extent of potential consumer detriment, should risks to consumers materialise.
Exit Conditions	Finally, consideration should be given to the conditions under which a firm can leave the Sandbox.
AML/CFT	AML and Combating of Financing of Terrorism rules are unlikely to be affected by sandbox processes and should remain in place.
Fit & Proper Tests	Senior management within firms participating in a Sandbox could be required to undergo fit and proper assessments to determine whether the individual is capable of performing the function they have applied to test.
Minimum cap/ requirements	Sandbox participants may be required to raise and hold a certain level of capital, to ensure adequate protections are in place for small firms.
Compensation	In the event that a firm participating in a sandbox fails consumers, there may be grounds for claiming compensation. The sandbox needs to have a policy for appropriate compensation

Sandbox Toolbox

Tools	Details
New Regulated Activity	Sandboxing' could require a new regulated activity such as 'sandboxing for testing'. This might involve introducing a new regime with sandbox-specific rules and the necessary flexibility to deliver a regulatory sandbox. This could result in a more streamlined authorisation process and potentially less regulatory requirements to comply with when testing. However, regulatory change takes time and resources. Also - supranational considerations.
Waiver	A sandbox could introduce waivers to enable existing rules to be relinquished for the purpose of the sandbox testing environment. However, the ability of a regulator to waive rules will be determined by its jurisdiction and mandate at both the national and international levels. Waivers may be the only option if an innovative test will breach an existing rule. Waivers give firms certainty that the regulator will not take enforcement action under conditions
Restricted Authorisation	The licencing process could be tailored within a sandbox context to allow firms to only test agreed ideas. This could truncate normal licencing processes and facilitate firms in meeting requirements. However, a restricted licence may still require firms to apply for a licence, pay an application fee.
Individual Guidance	When rules are unclear, individual guidance can help firms to understand how the regulator may interpret the requirements in the context of each specific test being conducted. Individual guidance may be costly and complex and may require specific disclaimers.
No enforcement action letters	In certain circumstances, a regulator could issue a 'No Enforcement Action Letters'. Provided firms act transparently, keep to the agreed testing parameters and treat customers fairly, firms can expect no disciplinary action.
Informal steers	The sandbox could offer informal steers on potential regulatory implications of an innovative product or business model that is at an early stage of development.

Approaches to Consumer Safeguards

Approaches to consumer safeguards	Promoting innovation, competition or creating opportunities for enhancing financial inclusion may be important institutional objectives, although these should not be at the expense of protecting consumers.
Only customers who give informed consent	Customers must be fully aware of the potential risks and available compensation. This approach offers flexibility to regulators to decide upon appropriate compensation terms. However, this may mean that only sophisticated consumers and firms whose awareness of testing limitations may distort outcomes creating a selection bias as more cautious customers opt out. Further, less sophisticated consumers may not fully understand the limitations on their rights.
Sandbox firms may determine the levels of disclosure, safeguards and compensation	Provided and the regulator works with firms to ensure they are comfortable with the proposals. This approach offers flexibility for firms to propose compensation arrangements and providing that safeguards are sufficient, testing with customers who are unaware of testing might be considered. However, if the agreed protection proves to be insufficient, this may be to the detriment of customers.
Same rights as customers who engage with authorised firms?	May have access to available financial compensation schemes. In this instance, the compensation system is already in place and customers do not need to bear additional risks. However, this may present challenges for sandbox firms if, for example, they would have to pay for access to the existing compensation scheme.
Sandbox firms could agree to compensate any losses	(including investment losses) to customers and need to demonstrate that they have the resources to do so (e.g., minimum capital, a guarantee scheme). Therefore, unless firms become insolvent, customers bear no risk from transacting with sandbox firms, which is a higher level of protection than with regular authorised firms. Conversely, as sandbox firms bear all the risk this can make it unattractive and unaffordable, especially for smaller firms. Further, if customers know that they have nothing to lose, this may distort testing outcomes

Sandbox: Pre-Application Period

External

- Develop & implement digital communication strategy
- Public consultation and outreach
- Designate Sandbox Ombudsman
- Launch FAQs and web portal
- Establish FinTech Office & Hotline

Internal

- Finalise core team, governance and reporting structure
- Develop knowledge products and collateral to ensure consistent messaging
- Identify internal and external expert networks
- Implement issue tracking

Objectives

- Raise market awareness of Sandbox programme
- Attract high quality applicants
- Develop application and in-take and triage capabilities

The FCA's Innovate Sandbox Eligibility Criteria:

Before being admitted into the Innovate Sandbox, the FCA will assess firms' applications against the following criteria:

Is the firm in scope?

Is it genuine innovation?

Is there a consumer benefit?

Is there a need for a sandbox?

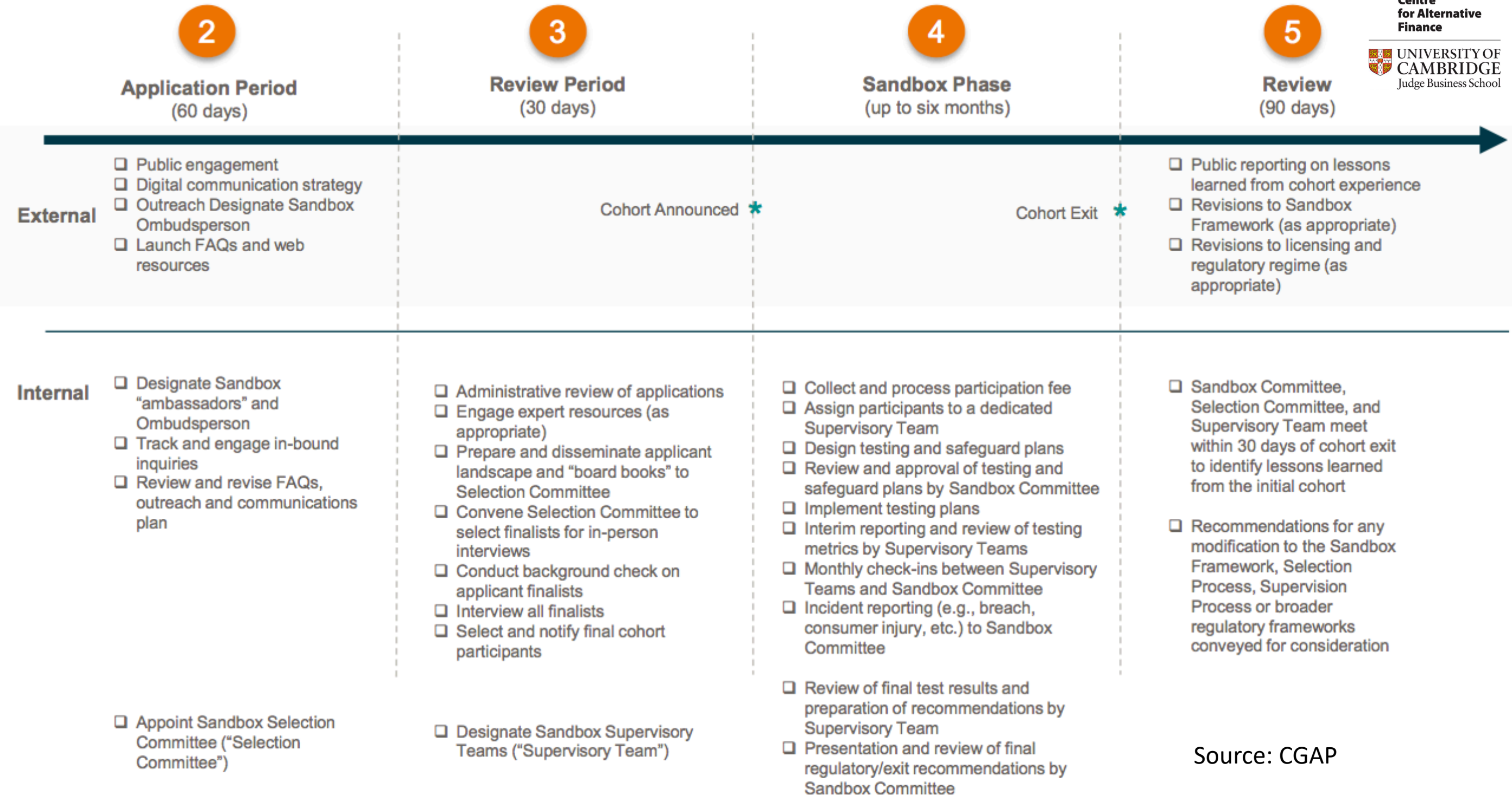
Is the firm ready for testing?

Implementing a Regulatory Sandbox



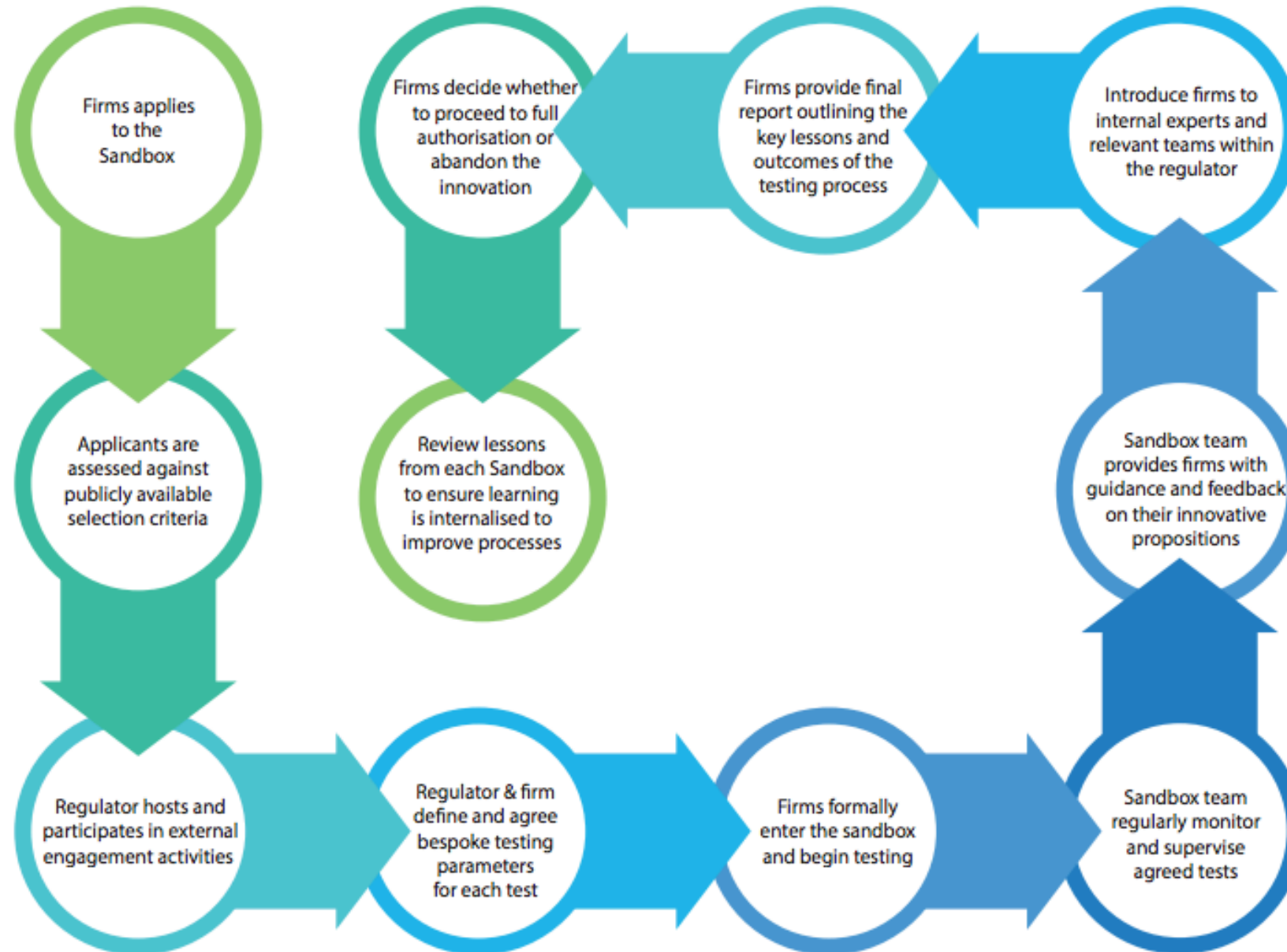
Implementation Considerations

- 1 Conduct a feasibility assessment focusing on capacity and objectives
- 2 Consult widely to identify challenges and crowdsource solutions
- 3 Ensure executive buy-in and institutional support, focusing on mindset and culture
- 4 Sequence and combine a variety of approaches for regulatory innovation
- 5 Start small, experiment often, and gain quick wins
- 6 Be adaptable, flexible, and open to refining the approach
- 7 Facilitate inter-agency coordination and collaboration
- 8 Develop a theory of impact and metrics of success
- 9 Ensure proportionality
- 10 Utilize regulatory innovation to support capacity building



Source: CGAP

Example Sandbox Applicant Journey



Post-Implementation Considerations



Potential Benefits & Measuring Success

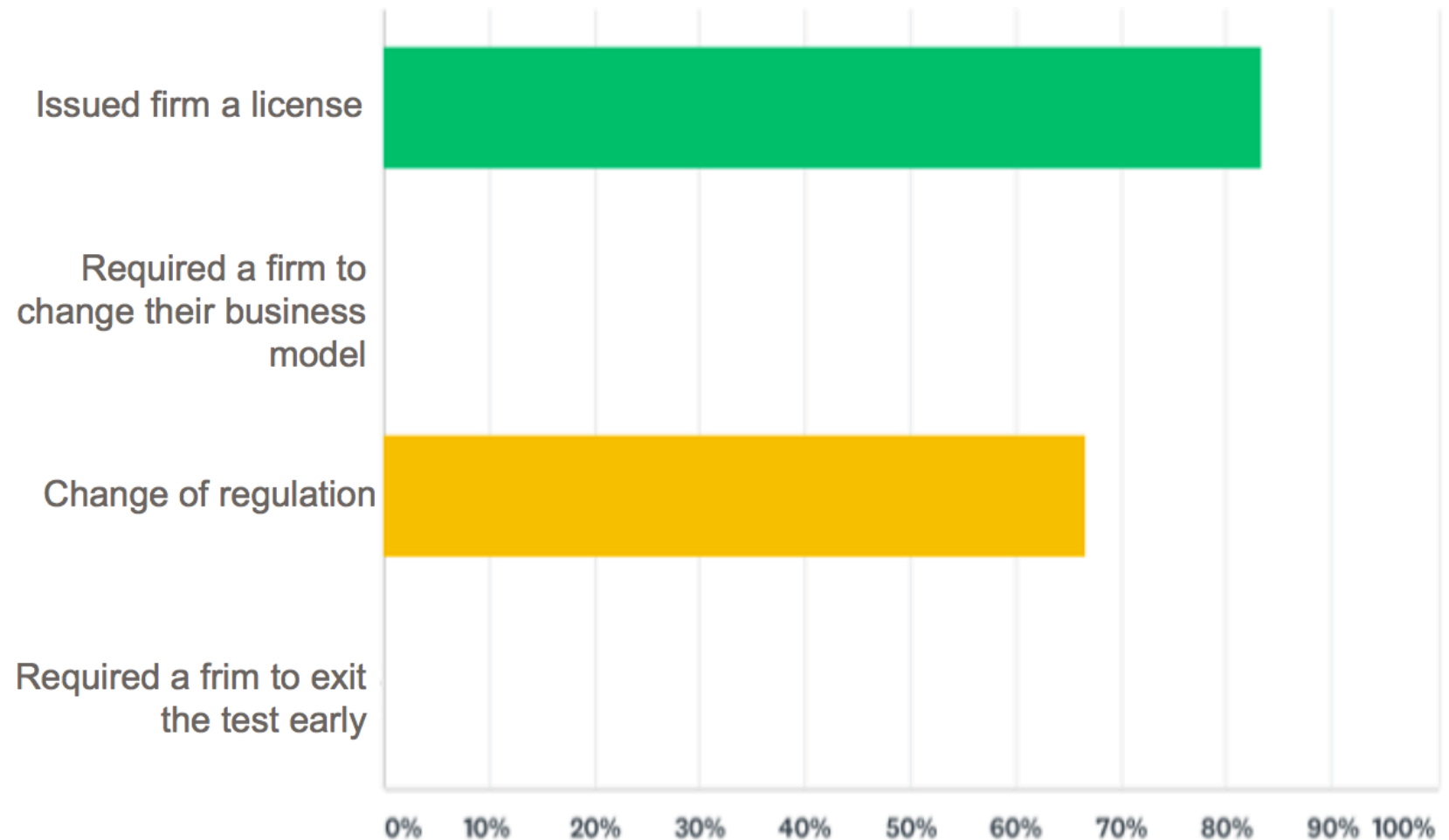
Benefits to firms	Potential Measurable KPIs
Opportunity to discuss their activities in detail with regulators.	Number of face-to-face meetings, phone calls, and emails with innovative firms.
Small firms are able to engage directly with the regulator otherwise challenging, especially for inexperienced entrepreneurs	Number of firms engaged with the regulator, differentiated by firm size.
Firms can better understand where they fit in existing framework.	Track regulatory domains of applicant firms vs. those accepted.
Even firms that do not necessarily need to be authorised can still receive guidance on regulations and best practice.	Number of firms which received guidance or informal steers.
Helps firms raise investment. Participation in a sandbox is generally a positive signal to prospective investors.	Investment raised by firms post-sandbox.
Reduces costs such as those associated with hiring in compliance consultants and lawyers.	Cost savings in legal counselling resulting from participation in the sandbox via a survey.
Helps firms to fast-track the regulatory process.	The time taken for firms to secure authorisation compared to standard channels.
Provides enough flexibility and lenience so that business models can adapt and pivot.	The number of firms that pivoted or changed their business models.

Potential Benefits & Measuring Success

Benefits to the wider market	Potential KPIS
Helps firms and market participants to keep in the loop about upcoming relevant changes and networking.	Number of firms and individuals communicated via newsletters and events.
Introductions to other regulators can help firms enter other markets.	Number of introductions made for participating firms to other regulators.
Attracts firms from overseas.	Number of firms that partake in the sandbox from overseas.
Benefits to regulators	Potential KPIS
Improves user experience and products which is better for consumers.	Number of sandbox-tested products are released into the market.
'Batched cohorts' are a more efficient way of using regulatory time and resources.	The cost per sandbox participant.
Great publicity for both firms and the regulator, especially with the Media coverage in relation to the sandbox.	
'batched cohorts.'	

Life for firms after a Sandbox

- Participating firms could be issued with a license and go on to be a regulated firm;
- The test has identified a major issue with the regulatory framework that needs addressing;
- Participating firms will need to adapt their business model to comply with the existing framework; and/or
- Participating firms will need to exit the sandbox early.



Regulatory Sandboxes

Regulatory sandboxes and financial inclusion

- May be used to develop a broader enabling environment for inclusive innovation.
- Help identify and remove potential frictions caused by existing rules or regulations.
- Sandboxes can help to reduce the time, costs, and uncertainty of launching a new product.

Lessons learned - Regulatory Sandboxes:

Neither necessary nor sufficient for promoting financial inclusion

Processes can be streamlined to reduce review and processing time

Thematic sandboxes are emerging as tools to support financial inclusion

Regulatory coordination is essential, particularly in multi-peak jurisdictions

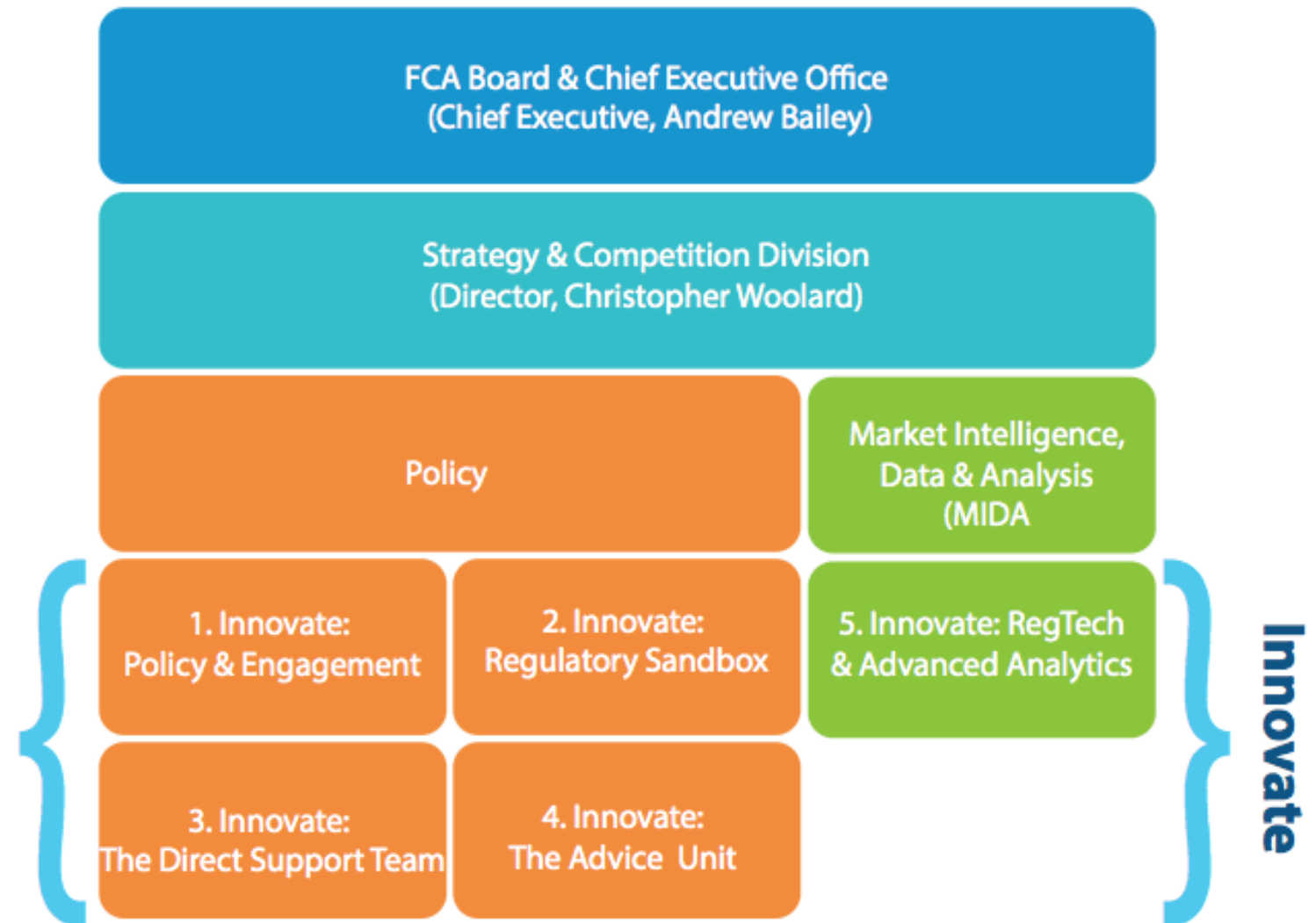
Senior leadership and institutional engagement are critical

Case Studies



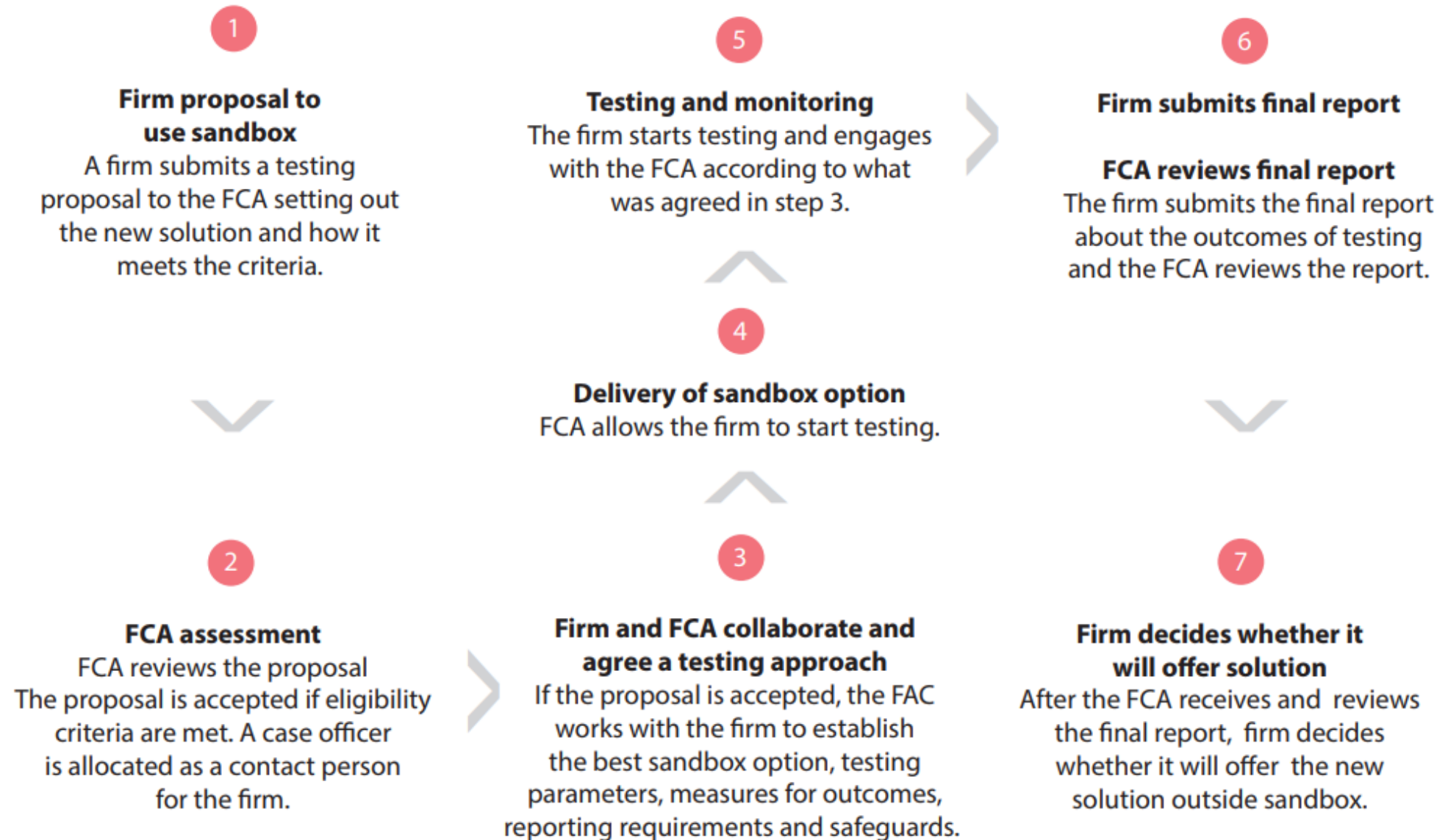
Case Study: FCA's Innovate

- Roundtables
- Surgeries: Q&A sessions
- Thematic workshops
- Monthly 'Showcase Events'
- Events and conferences
- Consultation processes
- Innovation sprints



Case Study: FCA's Innovate

Criteria for using Sandbox
Firm in Scope / Genuine Innovation / Consumer Benefit
Need for Sandbox / Background Research



1. Access to the regulatory expertise of the sandbox reduces the time and cost innovative ideas > market.

- 75% of firms accepted into the first cohort successfully completed testing.
- ~90% of firms that completed testing in Cohort #1 continued to a wider market launch.

2. Obtaining authorisation helps firms access funding.

- 40%+ of firms in cohort #1 received investment during or following their tests.
- Many firms use a sandbox test to assess consumer uptake and commercial viability.

3. Post Testing Reporting

- Facilitated significantly higher number of tests than anticipated, across a range of sectors & product.
- Received 146 applications across the first two cohorts of the sandbox. Of these applicants, 50 were accepted and 41 tested or are currently testing a range of propositions in the sandbox.
- Around a third of firms that tested in the first cohort used the learnings to significantly pivot their business model ahead of launch in the wider market.

4. Developing Business Models

5. Consumer Safeguards developed

6. Impact on Competition, Technology and Availability of Products & Services

Case Study: Japan

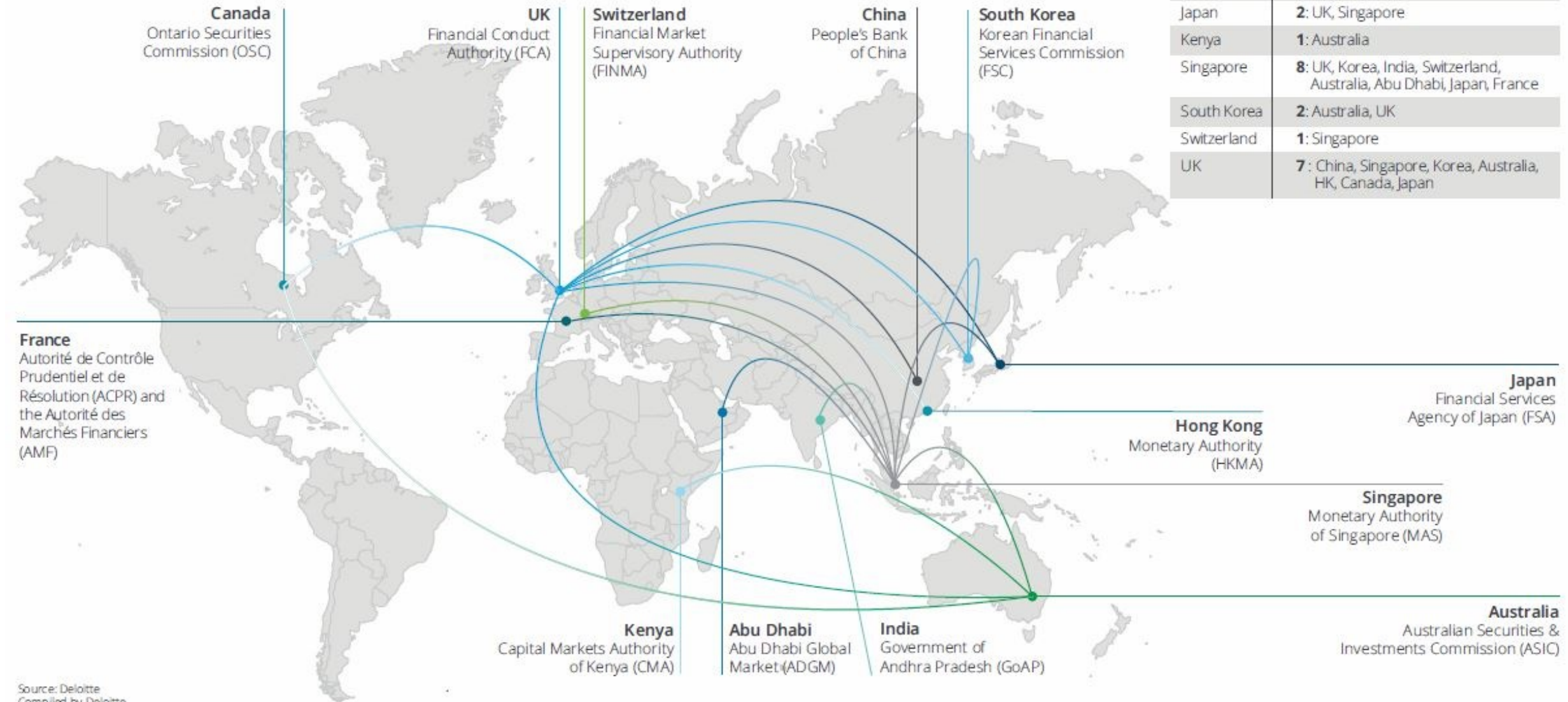
Cabinet Office of Japan

Multi-industry regulatory sandbox

- Automobiles
- Smart cities
- Finance
- Manufacturing
- Drones
- Self-driving cars
- Next Generation technologies
- Proof of Concept Hub

Multi-Jurisdictional Sandboxes

Location	Agreements with other regulators (in order of agreement date)
Abu Dhabi	1: Singapore
Australia	4: UK, Singapore, Canada, Kenya
Canada	2: Australia, UK
China	1: UK
France	1: Singapore
Hong Kong	1: UK
India	1: Singapore
Japan	2: UK, Singapore
Kenya	1: Australia
Singapore	8: UK, Korea, India, Switzerland, Australia, Abu Dhabi, Japan, France
South Korea	2: Australia, UK
Switzerland	1: Singapore
UK	7: China, Singapore, Korea, Australia, HK, Canada, Japan



Case Study: Global Financial Innovation Network

The GFIN is a network of 38+ organisations focussed on financial innovation in the interests of consumers - a more efficient way for innovative firms to interact with regulators and help them navigate between countries as they look to scale new ideas. This includes a pilot for firms wishing to test innovative products, services or business models across more than one jurisdiction.

The core aims of GFIN as they set include:

- To act as a network of regulators to collaborate and share experience of innovation in respective markets, including emerging technologies and business models, and to provide accessible regulatory contact for firms
- To provide a forum for joint RegTech work and collaborative knowledge sharing/lessons learned.
- To provide firms with an environment in which to trial cross-border solutions.
- It also aims to create a new framework for co-operation between financial services regulators on innovation-related topics, sharing different experiences and approaches.



```
mirror_ob = mirror_ob
    operation == "MIRROR_X":
        mirror_mod.use_x = True
        mirror_mod.use_y = False
        mirror_mod.use_z = False
    operation == "MIRROR_Y":
        mirror_mod.use_x = False
        mirror_mod.use_y = True
        mirror_mod.use_z = False
    operation == "MIRROR_Z":
        mirror_mod.use_x = False
        mirror_mod.use_y = False
        mirror_mod.use_z = True
```

```
selection at the end -add back the des
mirror_ob.select= 1
context.scene.objects.active = modifier_ob
print("selected" + str(modifier_ob)) # modifier
mirror_ob.select = 0
context.selected_objects[0]
context.objects[one.name].select = 1
```

```
print("please select exactly two objects, the
```

```
OPERATOR CLASSES
```

```
types.Operator):
    @staticmethod
    def mirror_mirror_x"
```