

Sandboxes as Tools for FinTech Innovation Comparative Analysis of Japan, Singapore, and the UK

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Abstract:

Regulatory sandboxes have become a central policy tool for supporting fintech innovation while managing risks. This article compares the economic effects of sandbox programs in Japan, Singapore, and the United Kingdom, focusing on how sandboxes affect firm financing, product development, market entry costs, and regulator learning. Drawing on global surveys, country descriptions and empirical work, the paper shows that sandboxes can shorten time-to-market for new products, raise follow-on investment for participating firms, and produce regulatory knowledge that reduces later compliance costs – yet they also concentrate selection effects, create potential competitive distortions, and require careful exit strategies to deliver net public benefit. The comparative evidence suggests that well-designed sandboxes – which combine clear eligibility rules, time-limited testing, consumer safeguards and pathways to authorization – produce positive economic returns, especially when embedded in a broader, coordinated policy framework.

Keywords — regulatory sandbox, fintech, innovation policy, Singapore, Japan, United Kingdom, financial regulation, economic impact.

I. ARTICLE

Regulatory sandboxes are controlled testing environments where firms can trial new financial products or technologies under a temporary, relaxed set of regulatory conditions while subject to monitoring and predefined safeguards. Since the first formal sandbox launched in the United Kingdom in 2016, the tool has spread internationally and now appears in a majority of the jurisdictions actively trying to foster fintech growth (FCA, 2016–2024; World Bank, 2021). The economic logic that underpins sandboxes is straightforward: by lowering immediate compliance costs and permitting small-scale live experiments, sandboxes reduce the uncertainty and fixed entry costs that typically deter innovative startups from bringing novel financial services to market. This reduction in frictions tends to accelerate product development, increase the probability that firms secure follow-on investment, and help regulators

generate the information needed to craft proportionate, evidence-based rules (BIS; Cornelli et al., 2020).

The United Kingdom’s sandbox – operated by the Financial Conduct Authority (FCA) – was the earliest large experiment and remains a reference point for empirical assessment. Studies exploiting FCA data show that firms admitted to the sandbox experience higher rates of subsequent financing and survival compared with comparable firms, suggesting the sandbox helps to unlock capital for promising innovations (Cornelli et al., BIS working paper). The FCA’s approach emphasized clear selection criteria (innovation, consumer benefit, readiness), close supervision during trials and transparent publication of outcomes – design features that appear to magnify the program’s economic benefits by reducing information asymmetries for investors and potential partners (FCA, 2016–2024; BIS, 2020).

Singapore offers a contrasting but complementary model. The Monetary Authority of Singapore (MAS) launched its fintech sandbox and broader Innovation Hub in 2016 and has used an iterative policy approach to incorporate lessons from trials into formal regulation – most notably in the Payment Services Act and in revised guidance on digital payment tokens. MAS’s multi-agency coordination and active outreach helped channel startups into regulatory pathways and generated policy adjustments that lowered compliance costs for a larger cohort of firms, not only sandbox participants (MAS, 2016–2024). Economically, Singapore’s approach shows how an active sandbox can function as a learning-by-doing mechanism for regulators that reduces regulatory uncertainty economy-wide and thus encourages more investment in local fintech ecosystems (MAS; OECD analysis).

Japan’s use of sandbox mechanisms differs again: rather than a single financial-sector agency running a stand-alone sandbox, Japan has applied a cross-government demonstration and approval process that involves competent ministers and sectoral authorities. This approach can be slower but has the advantage of producing formal legal clarity where necessary before wider deployment. The country’s framework has been used to test use cases in payments, digital identity and tokenization, and Japan’s experience highlights an important economic trade-off: deeper legal certainty (obtained through ministerial approvals) can reduce long-run compliance costs for firms but may raise the initial time and administrative costs of experimentation (Cabinet Secretariat, Government of Japan; IMF country review).

At the macro level, global surveys and multilateral reviews point to measurable economic benefits of sandboxes when they are well designed. The World Bank’s global review of sandboxes finds that many jurisdictions report increased investor interest in firms that participated in sandbox tests and that 70 percent of studied sandboxes in emerging markets contributed to local capacity building (World Bank, Global Experiences from

Regulatory Sandboxes). The OECD and other international organizations emphasize that sandboxes help regulators learn about technological risks and market conduct in a controlled way, which reduces regulatory uncertainty and ultimately lowers the cost of compliance for subsequent entrants (OECD, 2023). The reduced uncertainty translates into clearer signals for capital allocation – investors facing lower information asymmetry and better regulatory guidance demand smaller risk premia and are likelier to finance scale-ups.

Concrete statistics illustrate these points. Empirical analysis of the UK sandbox shows statistically significant increases in post-entry funding for participating firms in the quarters following admission (Cornelli et al., BIS working paper). Singapore’s fintech outreach and sandbox activity preceded notable growth in fintech investment and new licensing activity in the late 2010s and early 2020s; MAS reports and industry summaries document higher levels of engagement with regulatory processes and faster policy iteration after sandbox trials (MAS; industry reports). Japan’s demonstrations and ministerial approvals have produced targeted regulatory changes that reduce uncertainty for specific business models – trials that led to statutory or supervisory clarifications reduce the expected regulatory cost for firms operating at scale (Government of Japan; IMF review). Across all three countries, sandbox programs contributed to a broader innovation ecosystem where firms that successfully exit testing – either by obtaining licenses, amending designs or integrating regulatory feedback – are better positioned to attract partnerships, customers and investment.

Yet sandboxes are not a panacea, and the economic literature warns against naive optimism. Selection effects are important: sandboxes typically admit firms that are already relatively advanced or investor-backed, so measured post-entry gains partly reflect pre-existing quality (Cornelli et al., BIS working paper). If policymakers treat sandbox graduation as a signal that substitutes for careful authorization, they risk creating regulatory

forbearance that allows unfounded business models to scale. Sandboxes can also produce competitive distortions if incumbents cannot access similar testing arrangements or if exemptions granted to a small number of firms become de facto preferential treatments. These risks imply that positive aggregate effects depend on transparent admission criteria, clear consumer protections during trials, time-bound authorizations, and well-defined exit paths to full compliance or authorization.

Another downside is the potential fiscal and supervisory cost of failed experiments. When consumer harm materializes during a live test, reputational and financial damages can be significant, and the economic cost is not limited to the sandbox firm – losses can depress investor sentiment across the sector. That is why the FCA, MAS and Japanese authorities enforce consumer protection requirements and require contingency plans for adverse outcomes. Empirically, the existence of strict safeguards reduces the incidence of severe consumer loss during trials and strengthens the credibility of the regulator, which in turn preserves the sandbox's positive effects on investment and market confidence (OECD; World Bank).

Policy design matters. Comparative evidence suggests several best practices that maximize economic returns: define clear objectives (innovation, consumer benefit, financial stability), set transparent eligibility and exit criteria, require robust data collection and sharing to enable regulator learning, and use sandboxes as one element within a broader innovation strategy that includes sandboxes, innovation hubs, guidance letters and proportionate licensing. International coordination – harmonizing expectations around issues such as AML, data privacy and cross-border testing – raises the upside of sandboxes by reducing regulatory arbitrage and channeling cross-border investment into compliant ventures (FSB; OECD).

In short, regulatory sandboxes – when well designed – reduce regulatory uncertainty, lower

entry costs for experimentation, and increase the likelihood that successful pilots attract follow-on investment and scale. The United Kingdom's early experiment demonstrated measurable financing and survival benefits for admitted firms; Singapore's coordinated, iterative model shows how sandbox learning can translate into law and reduce systemic uncertainty; and Japan's ministerial demonstration approach highlights the value of securing legal clarity for new business models even if that path entails higher initial administrative cost. The net economic effect of sandboxes depends on selection mechanisms, safeguards, and integration with post-trial regulatory pathways. For policymakers seeking to promote fintech while protecting consumers and stability, thoughtfully constructed sandboxes remain a powerful, evidence-informed policy tool.

II. REFERENCES

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