

Regulatory Sandboxes in Latin America and the Caribbean for the FinTech Ecosystem and the Financial System

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ABSTRACT*

The FinTech industry has grown significantly in Latin America and the Caribbean and has become an alternative for improving regional financial inclusion levels. However, the innovations brought about by this growth pose a series of challenges for regulators and financial supervisors, who are tasked with reducing uncertainty associated with the phenomenon. Regulatory sandboxes are tools to mitigate uncertainty in a controlled environment in which companies can test their services under the financial regulator's oversight. There is a possibility that the region can advance toward common principles to allow ecosystem development and regulatory convergence among the different countries.

JEL Codes: G23, G28

Keywords: alternative finance, crowdfunding, financial institutions, financial markets, financial regulation, financial services, fintech, regulatory sandbox.

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LIST OF ACRONYMS

LAC	Latin America and the Caribbean
IDB	Inter-American Development Bank
FCA	Financial Conduct Authority
IMF	International Monetary Fund
FSB	Financial Stability Board
IOSCO	International Organization of Securities Commissions
MSMEs	Micro, small, and medium-sized enterprises

INTRODUCTION

FinTech platforms have changed the way the financial industry offers products and services to consumers around the world. These new business models, based on emerging technological developments, pose challenges to traditional companies while generating new ways to create, deliver, and capture consumer value.

According to a study by the Inter-American Development Bank (IDB) and Finnovista (IDB and Finnovista, 2017), Latin America and the Caribbean (LAC) are part of this transformation. The FinTech industry has been gaining strength throughout the region with more than 700 platforms that currently offer financial solutions based on new technologies. Of these, 32.7 percent are in Brazil, 25.6 percent in Mexico, 11.9 percent in Colombia, 10.2 percent in Argentina, and 9.2 percent in Chile. The study also reveals that alternative finance is the leading activity in the region, with 25.6 percent of the total platforms dedicated to this sector and 25.2 percent to payments, followed by business finance management (13.2 percent). Finally, it is interesting to note that the mission of more than 40 percent of monitored ventures in the region is to serve clients who are excluded or underserved by the traditional financial services sector.

Moreover, the study raises the need to establish specific regulations for FinTech platforms and activities in the region that will give certainty to entrepreneurs, financial consumers, and platforms. In this regard, the study suggests, as one of the alternatives for regulators, the creation of regulatory

sandboxes, a tool to mitigate uncertainty in a controlled environment in which companies can test their services under a regulator's supervision, with two purposes: (i) establish a more direct dialogue between the FinTech industry as a whole and supervisors and regulators in particular, to understand the nature of the businesses; and (ii) allow for a smoother transition for FinTech platforms and ventures and their controlling entities, toward oversight based on actual industry activities.

FinTech companies have responded to the region's gaps and asymmetries that continue to affect the allocation of credit, mainly to micro, small, and medium-sized enterprises (MSMEs). As a result, the alternative finance market is growing significantly in LAC. According to figures calculated by the Universities of Cambridge and Chicago in an IDB-sponsored study (Ziegler et al., 2017), the segment saw triple growth in 2016 as compared to 2015, reaching US\$342 million. The study shows how alternative finance is increasing in a very relevant niche: business lending, accounting for 71 percent of the total origination volume for 2016. The study also highlights that the region's leader in origination is Mexico at US\$114.2 million (33.3 percent of the total), followed by Chile (US\$97.8 million, 28.5 percent), Brazil (US\$64.4 million, 18.8 percent), Argentina (US\$12.6 million, 3.7 percent), Colombia (US\$11.2 million, 3.3 percent), and Peru (US\$9.9 million, 2.9 percent). This second study also raises the need for specific regulations and points out that sandboxes are a tool with adequate potential to promote ecosystem growth in the region.

Regulatory sandboxes offer innovative companies the possibility of operating, for a limited time, with a restricted number of clients, under conditions determined by the supervisor, and with less stringent requirements. They represent a very attractive and inexpensive option for testing products, services, and innovative technological solutions in a controlled environment. For supervisors and regulators, they offer a valuable space for learning how new sectors operate, assess whether and how they need to regulate areas not covered by rules, or modify those that may diminish the benefits of innovation.

This document introduces regulatory sandboxes in the area of finance. Section 2 defines regulatory sandboxes, and Section 3 presents and compares some experiences, with particular attention to sandboxes in the United Kingdom and Singapore.¹ Section 4 contains recommendations for Latin American countries, and Section 5 concludes.

¹ The following sections detail the aspects of regulatory sandboxes based on current models in the United Kingdom and Singapore. However, one of its main advantages is precisely flexibility, so other approaches are possible.

REGULATORY SANDBOXES

2.1 Innovation and Regulation

In a market economy, change is a continuous, progressive, gradual, and widespread process, which comes as a result of decisions that individual actors, companies, and organizations make every day. While the vast majority of them are routine, some involve changes in existing contracts between individuals and organizations.

The disruption of traditional models or contracts poses major challenges to regulators and market participants alike. The eternal dilemma is deciding when the regulator's intervention is necessary, that is, identifying the critical point at which something ceases to be "too small to matter" and becomes "too large to ignore" (Armstrong, 2017).

In general, the responses to the emergence of new or disruptive business models are as follows:

1. **Ex-ante approach (restrictive approach):** Prohibit or restrict products or processes based on the risks or uncertainty that they pose to the general public or the supervisor/regulator.
2. **Ex-post approach (proactive approach):** Actively facilitate and regulate new products or processes based on their potential social and economic benefits.
3. **Ex-post approach (vigilant approach):** Act only when risks have materialized or when the

activity has reached sufficient volume or caters to a significant number of financial consumers.

While regulators are often driven by the desire or need for quick intervention, it makes more sense to act prudently when it comes to innovation to ensure that the necessary skills and knowledge are in place to effectively monitor and control new activities.

The restrictive approach is the one most frequently encountered in the early years of FinTech ecosystem development. Some regulators and supervisors have adapted to the changes brought about by innovative business models, and the second approach (proactive approach) is beginning to pave the way for the prudent and controlled operation of FinTech platforms. The vigilant approach, however, is found in many countries by default where FinTech is allowed to operate without regulation. In this context, regulatory sandboxes propose a vigilant and proactive approach together with sufficient flexibility to quickly adapt to changes, within a technologically neutral framework that ensures that each activity is subject to the same regulation, regardless of the way in which the service is provided.

It is important to clarify that regulatory sandboxes are not a solution per se, but rather should be part of a set of policies and measures that enable prudential development of FinTech. Such packages must be tailored to the sector's business model and risks, which tend to be different from those of traditional financial institutions.

2.2 Differences in the FinTech Business Model

While there is no commonly accepted definition of a platform, the following could be proposed: “a place created through digital technology where producers and consumers interact and make exchanges that generate value for both parties.”² This concept does not preclude the possibility of physical interaction between parties to a transaction, as is the case in some LAC platforms. However, most of the more than 700 platforms identified in 2016 are digital, technology-based businesses that, unlike the traditional financial industry, do not require a physical presence or location for the financial service provider and customer to interact.

In terms of architecture (Parker, Van Alstyne, and Choudary, 2017), the region’s FinTech platforms conform to the three fundamental design principles of this business model. First, *they allow the exchange of information between participants*, enabling data-based decision-making. A typical example of this would be alternative credit score platforms. Second, *they allow for the exchange of goods and services*—in this instance, financial goods and services, such as credit—using the information exchanged between participants. Collective finance platforms thus allow a credit applicant (e.g., MSMEs) to share its borrowing profile directly with potential investors. The latter use this information to put their money in one or more financing projects with the applicant’s credit rating or credit score taken into account. Finally, they enable participants to exchange money. Platforms that provide financial services in the region typically use traditional means of payment such as credit or debit cards and other forms of electronic payment, so they rely on the traditional financial system to conduct their transactions. Many others, as is mainly the case in Brazil, are engaged in the payment and transfers business.

As previously mentioned, these platforms may have the ability to modify how value is created, sent, and captured in the financial system. In fact, they have

brought “disruptive innovation”³ to the region’s financial sector, in many cases providing services previously unavailable to financial consumers.

Given that in many cases the provision of such services is performed through previously non-existent systems or completely new products, it is essential for regulators to understand the platforms’ business model. Regulatory sandboxes could become the most cost-efficient tool for the region’s regulators and supervisors to learn firsthand what platforms do. The ultimate goal is to be able to regulate the business that platforms do in a balanced and proportional way without impeding the advancement of innovation.

2.3 Definitions of Sandboxes

Among the definitions of sandbox are the following two ideas:⁴ “a shallow box or hollow in the ground partly filled with sand for children to play in; a sandpit” and “a virtual space in which new or untested software or coding can be run securely.”

The combination of both ideas gives rise to sandboxes in the financial sector. They are a space for experimentation that enables innovative companies to operate products or services temporarily under certain rules that put limits on features such as the number of users or the period in which the product can be offered. This allows companies to test original

² This concept is based on Parker, Van Alstyne, and Choudary (2017).

³ The European Commission defines disruptive innovation as: “(...) any innovative concept, product and service that create new markets by applying new sets of rules, values and models which ultimately disrupt and/or overtake existing markets by displacing earlier technologies and alliances (...).” Available at: <http://goo.gl/jVRgJL>.

⁴ Oxford Dictionaries.

1: *North American* A children’s sandpit.

2: *Computing* A virtual space in which new or untested software or coding can be run securely. <https://en.oxforddictionaries.com/definition/sandbox>.

products, services, and solutions under the supervisor's watchful eye.

2.3.1 *How did the idea come about?*

Although sandboxes are widely used in different environments such as information technology (IT), their use in the financial sector is relatively recent.⁵ The idea came in response to the challenges posed by the advent of products and services using innovative techniques and infrastructures, specifically in what is known as FinTech.

For platforms, uncertainty around the legal framework and requirements applicable to their activities are creating barriers. It is often unclear to them which rules apply to them and who oversees them. Some studies (Houston et al., 2015) show that many entities may be discouraged from starting new businesses, first by the time⁶ and costs associated with registration and compliance with legal requirements, and second by the implications of noncompliance with such requirements. According to a study by the consulting firm PwC (2017), 86 percent of those in charge of financial institutions consider the main threat to business expansion to be over-regulation and the legal framework problems stemming from ambiguity and unclear rules.

Aggregate data for LAC's FinTech platforms show that of a total of 272 entrepreneurs in the region, 45.6 percent think that "existing regulation is adequate or no specific regulation is necessary." The views of these entrepreneurs contrast with those who consider that "no specific regulation exists and there is a need for it" (27.2 percent) or with those who believe that "regulation is excessive" (21.3 percent) or "very lax" (5.9 percent). However, a detailed look by segment can show a different picture. For example, crowdfunding platforms indicate, in 61.1 percent of cases, that "no specific regulation exists and there is a need for it," while 33.3 percent think that "regulation is adequate or no specific regulation is necessary." In contrast, just to mention another example, payment platforms consider, in 34.7 percent of cases, that "regulation is adequate or no specific regulation is necessary,"

while 32.7 percent are of the opinion that "there is no specific regulation and it is required" (IDB and Finnovista, 2017).

The fact is that, given the type of civil law applicable in most of the region, FinTech falls within the scope of financial activity, which in many cases is considered to be an activity of public interest or public service based on trust. This trust must be maintained, which makes regulation necessary to stipulate the conditions under which the activity will be conducted.

The advent of new technologies is posing enormous challenges to regulators, who are finding it difficult to keep pace with the changes. Sandboxes could serve as a space to promote dialogue with companies and understand how these businesses operate from their earliest stages. By doing so, the most complex aspects could be quickly identified and measures taken to maximize the benefits of FinTech in a protected and risk-controlled environment. In short, regulatory sandboxes in the region would make it possible to move toward sector-specific regulation.

2.3.2 *Which entities can participate?*

Sandboxes are environments for testing new ideas. As such, they could be deployed in any sector for new, existing, or already regulated companies. Technological advances have impacted every segment of the financial sector, shaping a complex FinTech ecosystem that encompasses areas such as automated portfolio management or consulting, virtual currency and blockchain technology, insurance, regulatory compliance, digital banking, alternative finance or loans, and remittance and payment systems.

⁵The first initiative of its kind, the regulatory sandbox for FinTech companies was launched by the Financial Conduct Authority in the United Kingdom in 2015. Available from the Financial Conduct Authority CA (a) at: <https://www.fca.org.uk/publications/documents/regulatory-sandbox>.

⁶Delays associated with regulatory uncertainty may discourage innovation and some studies estimate that the time needed to access the market may be one third longer as a result (Stern, 2014).

Innovation activity in these sectors is not exclusive to new entrants in the market today; it may come from well established companies that want to diversify their activities. Sandboxes can provide a space for experimentation and learning, open to any entity that offers original products or technical solutions, in any of the segments of the FinTech industry. Likewise, previously regulated entities may participate in the sandbox by testing and seeking approval for products that previously did not exist or were not licensed.

As for the region's regulators and supervisors, in those jurisdictions with integrated supervision, the answer is obvious: regulators and supervisors have the capacity to fully carry out their activities. In those jurisdictions where there is a division of responsibilities, it is recommended that the regulator assign the authority to the supervisory entity to operate the sandbox. In this respect, depending on the activities that need to be supervised, banking, securities, insurance, pension, and even consumer protection and data protection regulators and supervisors may participate.

2.3.3 How do they work?

Although internationally there are different approaches, in general, the test period parameters (duration, products, customers, amounts, loss cover mechanisms, etc.) are determined on a case-by-case basis between the supervisor and the companies or platforms, taking into account the activities conducted and the risks involved.⁷ In other models, such as the Australian model, the supervisory authority sets general criteria, and participation in the sandbox is open to any entity that can satisfy them.⁸ In Australia, all companies meeting the criteria can offer their products for up to 12 months to a maximum of 100 retail customers. As a general rule, the following could be identified as the main elements of regulatory sandboxes:

a. *Experimentation*

They function as a test environment, in the sense of a clinical trial, since they do not guarantee success and results are likely to be different than those expected.

Therefore, like patients in a clinical trial, both the participating companies and their clients must know the specific terms in advance and bear the risks.

b. *Limited duration*

Under no circumstances can they be used to keep companies indefinitely in the sandbox. These are temporary “experiments” that have a specific purpose: to provide validation and understanding of how innovative products, services, technological solutions, or business models work before they are available in a global marketplace. Therefore, they should only be kept there for the necessary time to achieve the stated goal.⁹

c. *Offer solutions case by case*

They are structured around basic principles that adapt to very diverse business models and allow for an individualized approach, based on the risks of each innovative proposal. The specific aspects of the tests and information to be reported can thus be determined on a case-by-case basis, depending on the complexity of the activities and the products and services offered.

d. *Suggest alternative measures*

Based on a flexible approach, they allow supervisors and regulators to choose regulatory options that suit each business model. These measures may consist of individual guidance on how to interpret and apply regulation, a commitment not to undertake any enforcement action during the trial period, a temporary authorization limited to certain activities, or exemption from compliance with certain rules. This depends to a large extent on the legal framework in each country and the powers conferred on the regulator/supervisor in each case.

⁷ This is the case of regulatory sandboxes in the United Kingdom and Singapore.

⁸ In Australia, all companies meeting the criteria can offer their products for up to 12 months to a maximum of 100 retail customers.

⁹ Most regulatory sandboxes established at the international level have a duration of between 6 and 12 months, with the possibility of extension.

e. *They are an exception*

Given that they operate in an experimental environment subject to risk, in practice they apply to a limited extent. This is not a general concept, valid for any innovative company, but only for those with viable business plans, offering disruptive products or services that can justify creating value for consumers.

2.3.4 *What's next?*

Once sandboxes are terminated, supervisors and regulators can evaluate the risks associated with new activities in light of the results obtained. If the products

or services tested are found to be suitable for customers, regulation could be proposed and large-scale commercialization authorized. Conversely, if deficiencies identified during operation are not adequately addressed or are considered to carry excessive risks, the authorities could prohibit or limit such activities.

In any event, the information obtained can be used to find out how these new sectors operate and to assess whether there is a need to regulate aspects that are not covered by the rules or to modify those that may hinder innovation.

EXPERIENCES IN THE COMPARATIVE FIELD

3.1 United Kingdom

3.1.1 *Innovation Hub*

The United Kingdom has been a pioneer in supporting new business creation through government policies. In 2014, the country launched Innovation Hub, an ambitious program to boost competitiveness and the development of novel financial services in its markets (FCA, 2015a). It aims to promote small and medium-sized enterprises offering innovative products and services that can help improve the lives of consumers. Since its inception, the Financial Conduct Authority (FCA), the authority responsible for financial services and markets regulation in the UK as well as prudential regulation of over 24,000 entities, has received more than 400 applications and advised over 200 entrepreneurs (FCA, 2015a; 2015b). Along with other measures, such as holding events and innovation forums, the FCA has provided a space for dialogue between the supervisor and the firms that are bringing in creative proposals.

Regulatory restrictions may discourage market entry for operators and distort competition, preventing consumers from enjoying new products or services. The innovation program aims to identify the barriers that hamper innovative activities and seek to eliminate them without compromising consumer protection standards (FCA, 2015c). The program is structured around three pillars: (i) innovation laboratories, (ii) a specialized business advisory unit, and (iii) regulatory sandboxes.

The innovation laboratories seek to enable both new and existing companies to bring innovative products or services to market. To this end, a specialized FCA team supports the entities by advising on applicable legislation and facilitating the processing of necessary authorizations. This makes it possible to quickly identify those aspects of the regulatory framework that may slow progress and require modifications. The advisory unit is geared toward companies that use automated models (known as “robo advisors”) to reduce the costs of financial advice to clients, among others.

These measures are enhanced by entering into agreements with regulators/supervisors from other markets, such as Australia, Korea, and Singapore (FCA, 2016a, 2016b, 2016c), among others, which aim to simplify the procedures for companies to operate in different markets and to facilitate information exchange on innovations, emerging trends, and regulatory issues.

3.1.2 *Regulatory Sandboxes*

Following the British government’s recommendations and commitment to innovation, the Regulatory sandboxes project (FCA, 2016d) was launched in November 2015 under the supervision of the FCA. This initiative is the first of its kind worldwide, and its example has been followed by Australia (Australia Securities and Investment Commission, 2017), Canada (Badour and Fouin, 2017), the Netherlands (AFM, 2016) and Singapore (Monetary Authority of Singapore, 2016), and projects are underway in other countries. The basic features are the following:

a. *Admissions Criteria*

The acceptance of participating companies into the sandbox is based on public, objective, and transparent criteria. Entities without FCA authorization as well as regulated companies that intend to offer products or services not included within the scope of their authorization may participate. To do so, they must prove that: (i) a novel solution is being proposed in a regulated sector or supports a regulated activity in the UK financial market; (ii) the products, services, or technology offered are brand new in the United Kingdom; (iii) their large-scale commercialization can benefit consumers; (iv) they have a need to test their business model; and (v) they have invested sufficient resources in regulatory analysis and risk mitigation and are able to operate and test their innovations in a real environment.

b. *Unauthorized Entities*

For businesses not authorized by the FCA, an “express” authorization or licensing process, with restrictions, is set up for faster turnaround, which allows them to test their products or services for a period of three to six months and offer them to a limited number of customers. The advantage is that they are able to operate according to requirements commensurate with their activities. The main drawback is that, although it is a simplified process, licensing is not immediate and involves some associated costs. In practice, it has some limitations, as it does not extend to payment services or electronic money transactions, which are outside securities regulation,¹⁰ or to activities subject to harmonized regulation in the European Union.

c. *Authorized Entities*

The model developed for already authorized companies and technology support providers aims to reduce uncertainty about the applicable rules. The issuance of no enforcement letters and the FCA’s individualized advising allows entities to test their products or services, with the assurance that they have the consent of the supervisory authority, provided that they operate within the agreed parameters.

d. *Safeguards*

To mitigate the risks associated with sandboxes and prevent direct customer impact, the FCA proposes different protection mechanisms such as: (i) limit the testing activities to customers who have given their informed consent; (ii) require entities to have sufficient resources to compensate for any losses; (iii) guarantee the same rights as those enjoyed by customers of authorized and supervised entities; and (iv) agree on transparency, protection, and compensation measures on a case-by-case basis, the latter being the FCA’s preferred option.

e. *Recommendations for the Industry*

As a complement to the above, the FCA has issued two interesting recommendations to promote collaboration between financial services companies, software developers, technology companies, and business accelerators to face together the challenges associated with innovation. The first is the creation of a virtual sandbox to test new solutions in a simulated environment, for example, by conducting remote testing. The second proposes an umbrella sandbox, based on the formation of a non-profit company, authorized and supervised by the FCA, which would allow companies to offer their products and services by acting as agents of this umbrella company. The proposal is limited in that it is only applicable to activities that can be developed under the agent’s scheme¹¹ and requires the consensus of the umbrella organization’s members, which is why it has not yet been implemented.

f. *Results*

Countries are following the experience in the United Kingdom with great interest not only within the European Union but throughout the world. In fact, other countries are carrying out similar projects in their markets. There is now a “cohort” or group model, with

¹⁰ Financial Services and Markets Act 2000. <http://www.legislation.gov.uk/ukpga/2000/8/contents>.

¹¹ Financial Services and Markets Act 2000 (Appointed Representatives) Regulations 2001/1217. http://www.legislation.gov.uk/uksi/2001/1217/pdfs/uksi_20011217_en.pdf.

a closed number of participants, which allows authorities to more efficiently plan and manage the resources needed for implementation and adjust the number of participants according to resource availability. The “Regulatory Sandbox Lessons Learned Report” published by the FCA (FCA, 2017) contains a summary of the results achieved after one year of operating the sandbox. Fifty companies, selected from 146 applications received in the first two phases of the program, participated. The conclusions show that, in general, the sandbox met its objectives by reducing the time and costs associated with the launch of new products and services, access to financing for companies, as well as verification of the technical and commercial viability of the solutions put forward. This has contributed to 90 percent of companies in the first phase and 77 percent in the second phase moving toward placing their products on the world market. It has also made it possible for the supervisory authority to establish, alongside participating institutions, appropriate consumer protection mechanisms.

3.2 Singapore

In emerging economies, the Asia-Pacific region has seen the largest increase in investment in fintech companies. Some countries, such as Singapore, are pushing forward initiatives to increase their market efficiency and competitiveness, improve risk management, and increase the supply of products and services under more favorable consumer conditions. In 2015, the Financial Technology and Innovation Group was formed¹² within the Monetary Authority of Singapore¹³ to develop policies and strategies for promoting activity around innovation in the country.

The agency considers fostering an environment that promotes the use of innovative technologies to be the key factor for positioning itself as an international financial center. To this end, companies are offered the possibility of using a regulatory sandbox under their supervision where they can experiment with innovative products and services in a given space and

for a specific period. Its approach is flexible in that it permits, exclusively over the duration of the sandbox, relaxation of compliance with certain legal requirements, such as asset custody, administrative body composition, solvency funds, and capital requirements, among others. However, the rules that apply are those that have a direct bearing on consumer risk, such as those relating to an entity’s diligence, honesty, and integrity, confidentiality and customer information, funds management, as well as prevention of money laundering and terrorist financing activities.

Participation in the sandbox is not exclusive to financial institutions; it is also open to technology and support companies. To do so, they must certify that they have already performed tests on the services or products they intend to offer and that they have examined the legal and regulatory framework. Those providing financial services similar to those that already exist in Singapore are excluded, unless they are based on the use of a new technology or a new application of existing technologies.

To be able to join the sandbox, companies must prove that (i) the products or services offered, or the technology used, are original and solve a problem or are beneficial to consumers; (ii) have the intention and means to market them in the Singaporean market; (iii) have defined different scenarios and possible outcomes, along with the information to be reported to the supervisor in each case; (iv) have clearly and precisely established sandbox conditions and limitations; (v) have risk mitigation procedures in place; and (vi) have designed transition and exit mechanisms.

At the end of the set period, if results are satisfactory and companies believe they have a viable business model, they would be allowed to market their products or services on a large scale. In such case, they

¹² Financial Technology Innovation Group (FITG). <http://www.mas.gov.sg/news-and-publications/media-releases/2015/mas-sets-up-new-FinTech-and-innovation-group.aspx>.

¹³ Monetary Authority of Singapore (MAS). <http://www.mas.gov.sg/About-MAS.aspx>.

would no longer enjoy the flexibility of the sandbox, but would be subject to all legal requirements applicable to their activities.

3.3 International Initiatives

3.3.1 European Commission

In February 2017, the European Commission announced the establishment of a FinTech working group to formulate policy recommendations and propose alternative measures.¹⁴ The Commission acknowledges the potential of new technologies to enable disintermediation in financial services and efficiencies that benefit consumers and businesses. Nevertheless, it also raises questions about regulation, the way in which transactions are executed, and transaction security. Comprising experts in various areas such as financial legislation or data processing, the working group aims to analyze how technology is transforming financial services and assess their long-term implications.

In the area of regulation, they propose looking at the approaches adopted in different European countries and considering the extent to which they can create barriers to competition as well as efficiency in financial markets. Likewise, they also aim to assess whether the current rules and policies are adequate or whether other measures to promote innovation and help manage risks need to be implemented.

In addition, the European Commission conducted a public consultation, which ended in June 2017,¹⁵ aimed at financial services providers and consumers.¹⁶ The goal was to assess whether the regulatory and supervisory framework favors innovative activity in line with the principles of technological neutrality, proportionality, and market integrity. The responses received indicate that entrepreneurs may be subject to disproportionate or inconsistent legal requirements because supervisors may not have the experience, knowledge, and skills needed to respond to technological change. The sandbox proposal is well

regarded and the possibility of developing a Europe-wide sandbox for fintech companies that want to operate in several European Union markets has been suggested.¹⁷

3.3.2 European Parliament

The European Parliament, in its report “FinTech: the influence of technology on the future of the financial sector,”¹⁸ makes reference to sandboxes and believes they can provide a learning space for new technologies, which can be used for future policy-making. They bring together a wide range of market participants such as startups, large financial groups, technology companies, and regulators, which suggests that States value the possibility of putting them into practice as a means of making progress in the FinTech domain.

Within the FinTech and Distributed Technologies Working Group framework, the Parliament has instructed the European Commission to launch a pilot project for technical and regulatory expertise acquisition in these areas. The European Blockchain Observatory aims to gather opinions and ideas on the opportunities and threats associated with this technology,¹⁹ to issue,

¹⁴ https://ec.europa.eu/commission/commissioners/2014-2019/dombrovskis/announcements/vice-president-key-note-speech-FinTech-digital-innovation-conference_en.

¹⁵ https://ec.europa.eu/commission/commissioners/2014-2019/dombrovskis/announcements/vice-president-key-note-speech-fintech-digital-innovation-conference_en.

¹⁶ https://ec.europa.eu/info/finance-consultations-2017-FinTech_en.

¹⁷ For example, the Commission or European authorities, as is suggested, could work together with national authorities to test new FinTech solutions, such as blockchain technology for information reporting, which may be used at a transnational level.

¹⁸ [http://www.europarl.europa.eu/sides/getDoc.do?type=COM-
PARL & reference = PE-597.523 & format = PDF & language =
on & secondRef = 01](http://www.europarl.europa.eu/sides/getDoc.do?type=COM-PARL & reference = PE-597.523 & format = PDF & language = on & secondRef = 01).

¹⁹ Blockchain or Distributed Ledger Technology (DLT) is a set of electronic transaction records that constitute a shared database. Its uniqueness lies in the fact that the records are held by a network of participants and not by a central authority as is the case in traditional markets.

together with the European Commission, recommendations to European authorities.

3.3.3 IOSCO

In February 2017, the International Organization of Securities Commissions²⁰ published the “Report on New Financial Technologies (FinTech).”²¹ The report notes that some regulators²² believe that sandboxes could enable FinTech companies to offer financial services, under a flexible regulatory framework, where they can experiment with innovative technologies and solutions in a controlled environment and within specific parameters. In contrast, others, such as France’s Financial Markets Regulator,²³ understand that they may lead to an “unlevel playing field” between sandbox members and other innovators or incumbents. Therefore, they propose a rules-based approach adapted to the scale and complexity of the activities carried out. They believe that sound regulation could help institutions gain investor confidence, thereby enhancing the credibility of the entire financial system.

3.3.4 Other Organizations

FinTech is also on the agenda of other institutions such as the European Economic and Social Committee, the European Supervisory Authorities,²⁴ the European Central Bank, and the European System of Central Banks. It is a priority area for the G20, and the Commission is encouraging discussions in the Financial Stability Board and other international fora.

Speaking to the European Parliament in May 2017, Mario Draghi²⁵ addressed the potential of new technologies and their ability to increase the efficiency in the eurozone’s financial sector by offering a wider range of products and services at lower cost. The president of the European Central Bank, however, stressed the need to adapt the regulatory framework to the FinTech boom by giving supervisors tools to deal with new risks. Among these, he noted the consequences of cyber attacks, which have become a

priority for national and European authorities, and market fragmentation, or the loss of monetary policy effectiveness, prompted by the emergence of new players. He also indicated that distributed technologies, also known as blockchain, are among the most dynamic segments and could have a huge impact on payment processing systems and securities transactions, and therefore continuous monitoring is necessary to anticipate potential risks.

In June 2017, the Financial Stability Board²⁶ published an interesting document²⁷ that examined FinTech’s effects on the financial sector. The Board feels that, although FinTech’s limited size does not currently pose any problems with regard to the system’s stability, its evolution needs to be followed to identify all relevant implications. The report identifies three priority areas requiring close international collaboration: (i) management of operational risks associated with the provision of services by third parties, (ii) protection against cyber-attacks, and (iii) monitoring

²⁰ The International Organization of Securities Commissions (IOSCO) is the international body that brings together the world’s securities regulators. It develops, implements, and promotes adherence to internationally recognized standards and works closely with the G20 and the Financial Stability Board on the global regulatory reform agenda. https://www.iosco.org/about/?subsection=about_iosco.

²¹ <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf>.

²² From countries such as Australia, Canada, Malaysia, Singapore, and United Kingdom.

²³ Autorité des Marchés Financiers, regulatory body for financial market participants and products in France. http://www.amf-france.org/en_US/L-AMF/Missions-et-competences/Presentation.html?langSwitch=true.

²⁴ European Banking Authority (EBA), the European Securities and Markets Authority (ESMA), and the European Insurance and Occupational Pensions Authority (EIOPA).

²⁵ <https://www.ecb.europa.eu/press/key/date/2017/html/ecb.sp170529.en.html>.

²⁶ The Financial Stability Board (FSB) was set up in April 2009 to coordinate, at the international level, the work of national financial authorities and international organizations in order to develop and promote the implementation of effective regulatory and supervisory policies in the financial field. <http://www.fsb.org/about/>.

²⁷ <http://www.fsb.org/wp-content/uploads/R270617.pdf>.

of macro-financial risks that could arise from an increase in the volume of FinTech activities.

The International Monetary Fund²⁸ has also recently released a discussion paper, “FinTech and Financial Services: Initial Considerations” (IMF, 2017), which provides a context for reflection on how new technological solutions are affecting competition in the financial sector and posing challenges to regulators. It contains a wide-ranging discussion on trends in different segments, with particular attention to cross-border payments and the impact of blockchain technology. One key finding is that boundaries between different service providers are becoming increasingly blurred and market entry barriers are changing. Thus, fostering international cooperation is essential. It also points to balance between efficiency and stability as a top priority to maintain confidence in a constantly evolving financial system, especially against risks such as cyber attacks or money laundering and terrorist financing operations. The IMF believes that regulators should adopt

a business-oriented approach and develop rules and standards to ensure data integrity as well as that of algorithms and platforms. It stresses the need to assess policies that promote open infrastructures and to adapt legal principles to the observed new models.

Outside the financial sphere, worth noting is the UN initiative, which has brought together a group to analyze the application of blockchain technology in improving humanitarian services (UN, 2017). To reduce transaction costs and prevent fraudulent transactions, systems are being put in place to accept contributions in multiple cryptocurrencies using distributed ledger technology.

²⁸ The International Monetary Fund (IMF) promotes financial stability and international monetary cooperation. It seeks to facilitate international trade, employment promotion, sustainable economic growth, and poverty reduction across the globe. It is administered and held accountable by its 189 member countries. <http://www.imf.org/es/About/Factsheets/IMF-at-a-Glance>.

TOWARD A REGULATORY SANDBOX FOR LATIN AMERICA AND THE CARIBBEAN

As previously noted, the use of new technologies and the application of more streamlined solutions in Latin American countries has resulted in the offering of previously unaffordable or difficult-to-access financial services to individuals and companies. Policies to develop an ecosystem that encourages and promotes innovation could lead to the provision of products and services at more competitive prices.

Given that 49 percent of the region's population cannot take advantage of formal financial services,²⁹ it is not surprising that financial inclusion has become one of the significant challenges facing governments in the 21st century. Progress in this direction requires policies that simultaneously promote (i) investor protection; (ii) transparency, competition, and market efficiency; and (iii) systemic risk prevention.

In civil law-based legislation, it would seem that regulatory sandboxes may pose potential conflicts of interest for regulators or supervisors. In practice, however, this is not the case, as they are not a tool for promotion, but for regulation and supervision. Regulatory sandboxes are a regulatory tool because they allow, through first-hand knowledge of business models, for the creation of specific applicable regulations. At the same time, they are a supervisory—or even a preventive—tool in the sense that they make it possible to determine whether an activity represents a risk to the public and to enforce the requirements considered necessary to mitigate it. Therefore, the most complex aspect of sandboxes lies precisely in striking a balance between promoting innovation and protecting

the interests of all players within a stable financial system. The other major challenge is regulating new activities in proportion to the risks they pose.

The IDB has consistently supported the FinTech ecosystem's advancement in the region, from public policy and regulation to a balanced and commensurate approach to the industry. Specifically, through a Regional Technical Cooperation,³⁰ assistance has been provided to the governments of Argentina, Chile, Mexico, Paraguay, and Peru in developing policy frameworks for alternative finance.³¹ Similarly, work has been ongoing with Pacific Alliance countries and Brazil along the same lines. In all instances, in addition to providing regulatory recommendations, governments have been advised to create sandboxes with a dual purpose: (i) to establish a more direct dialogue between the FinTech industry and supervisors and regulators toward understanding the nature of the business, and (ii) to allow for a smooth transition of FinTech platforms and ventures into activity-based supervision.

Proposed below are a series of recommendations to precede the establishment of a regulatory sandbox in each jurisdiction. Then, the essential guidelines are set forth for the region's regulators to put in place. This ultimately leaves open the possibility of setting up a regional sandbox.

²⁹ Global Findex 2014, World Bank.

³⁰ Available at: <http://www.iadb.org/en/projects/project-description-title,1303.html?id=RG-T2631>.

³¹ Ms. Sonia Vadillo Cortázar, co-author of this document, has participated as a consultant in these technical assistance projects.

4.1 Legal Framework

The platforms that participate in the sandbox benefit from a particular status that allows them to operate temporarily within established parameters. However, they are not considered to be under supervision, and therefore their customers do not enjoy the same level of protection as those under surveillance, and both parties should be aware of this.

As this is a test space, the results are likely to be different than expected. Accordingly, platforms should be required to assess the contingencies associated with their activity and establish mechanisms to prevent any negative impact on their customers. Likewise, consumers must understand that sandboxes are testing grounds and accept the risks involved in acquiring new products or services, which have not been sufficiently proven in a real market.

Regardless of which authority will oversee operations, it is crucial to be very clear that restrictions are in place to ensure the necessary conditions, in a controlled environment, under which the platforms operate. Under no circumstances is the viability of the tests guaranteed, nor are positive results assured.

4.1.1 Legal Requirements: Create the Sandbox

As a starting point, a preliminary analysis should be conducted to identify:

- i. Which regulatory barriers do companies seeking to test new ideas encounter and how can they be lowered?
- ii. Which is the legal framework for new activities and which powers do regulators or supervisors have to adjust it to meet the needs of innovative entities?
- iii. What protective measures should be implemented?
- iv. What are the objectives of the sandbox?

Once these questions have been answered and since this is a new practice in LAC countries, all necessary precautions need to be taken to operate with maximum legal certainty. For this reason, it is essential that there be a prior mandate or administrative act (law, decree, circular, or otherwise, depending on each country's legal system) authorizing the creation of a regulatory sandbox and granting powers to an authority that will be responsible for overseeing its operation.

As in the regulation of the various segments of the FinTech sector (see in particular Herrera, 2016), a legal framework based on general principles is considered more appropriate than a specific rule. Mexico recently approved a “Law to Regulate Financial Technology Institutions,”³² which includes a temporary authorization for “novel models,” which for all intents and purposes constitute a regulatory sandbox. It is possible that new FinTech companies and regulated and supervised entities alike can use it to test their novel models.

Although it is not a complex and costly procedure, there should be a pre-selection process carried out by the supervisor to ensure that the platforms included in the sandbox meet minimum standards. Below are three basic recommendations on sandbox requirements.

4.1.1.1 Recommendations on entry criteria

- a. **Innovation:** The business model or project put forward should be novel. Depending on the set purpose each authority assigns to the sandbox, this may mean that:
 - i. The product or service offered does not previously exist or is not licensed.
 - ii. The platform creates a new channel for offering financial services.

³² Available at: http://www.senado.gob.mx/sgsp/gaceta/63/3/2017-10-12-1/assets/documentos/Iniciativa_Ejecutivo_Federal.pdf.

- iii. It relies on the use of a financial technology or innovation not previously tested in the jurisdiction.
 - iv. Anything else that the regulator considers to be innovation.
- b. **Entry into production:** The product or service should be ready to operate in trial mode and the candidate platform should have adequate capacity to offer it.
- c. **Benefit:** The platform should be able to demonstrate that the product or service can favor the production, shipment, capture, or generation of value for the financial consumer.

4.1.1.2 *Recommendations on platform requirements*

Candidate platforms should certify that they have sufficient technical and financial capacity and a structured business plan. Before starting to operate in the sandbox, an application for admission should be submitted with the following information:

- a. **Legal documentation**
 - i. Certification of the platform's existence and its representatives. Depending on the legal system of each jurisdiction, the company type may vary.
 - ii. Description of the company's corporate purpose, with details of the activities it will carry out.
 - iii. Company address identified.
- b. **Business plan**
 - i. An explanation of the problem solved by the service or product offered.
 - ii. Target market: geographic location, number of clients, and maximum amounts per transaction, among others. Depending on the regulation in each country, a distinction could be made between qualified and unqualified investors.
 - iii. Business model breakdown.

- iv. Risk analysis and management policies, particularly those related to cybersecurity.
 - v. Process for entry into production for the general public.
- c. **Damage protection:** The platform should set out the anticipated remedies for possible damage to customers during the trial period. To this effect, a relatively efficient solution could be to obtain civil and administrative liability insurance.
- d. **Close out and exit procedure:** The platform should be able to bring its activities to an end if prompted by the supervisor, ensuring that customers are unaffected. However, they shall not be entitled to compensation for damages other than those for which the platform is responsible.

4.1.1.3 *Recommendations on standard procedures*

- a. **Duration:** Given the region's characteristics, an initial duration of six months is recommended which may be extended, if appropriate, by the supervisor. This is due to the monitoring costs involved and the fact that it is a trial period.
- b. **Number of clients:** This will depend on the size of the country's economy, but the sample should be statistically significant and verifiable. A sufficiently diverse group should be selected, with no potential conflicts of interest or links to the platform's shareholders or legal representatives.
- c. **Information disclosure:** The platform should inform its clients beforehand of the risks that could arise and the envisioned mechanisms for hedging or indemnification. They, in turn, should indicate (e.g., through an electronically signed document) their consent and acceptance of the sandbox's conditions.
- d. **Transmission of data to the supervisor:** It is important to define the content of the information to be reported by the platform and the frequency

of transmission in advance. It should not be limited to transactional data but should also include key compliance milestones, number and type of customers, identified risks, and mitigation measures, among other data. In the event of an extraordinary risk, the platform should immediately communicate this and corrective measures should be taken.

4.1.2 *Supervisor's Powers and Safeguards*

The introduction to this section of the paper illustrated the relevance of legal provisions to allow supervisors to implement the regulatory sandbox. Due to the diversity of existing systems in the region, there is no single formula that can be applied; therefore, a number of general criteria have been identified:

- a. **Responsibilities:** Although it may seem obvious, it is essential to grant sufficient authority to the corresponding supervisor to implement the regulatory sandbox with assurances. Different authorities with financial supervisory powers may exist in each market. For example, in Mexico, the National Banking and Securities Commission is responsible for surveillance of both the securities markets and the banking sector, while in other countries, such as Argentina, Chile, and Peru, responsibilities are distributed among several institutions.³³ Therefore, the sandbox should include the participation of all financial supervisors (banks, insurance, pensions, securities), as well as central banks, financial consumer protection agencies, and any other entity competent in financial matters or activities. This would make it easier for the abovementioned agencies to build the necessary institutional capacities (topic to be discussed below).
- b. **Supervisor protection:** In the rule regulating the sandbox, it should be made explicit that the participating platforms are not monitored or inspected by the supervisor and therefore, there is no administrative responsibility of the authority

or its officers, derived from the risks that materialize in the sandbox.

- c. **Temporary authorization:** Temporary authorization to operate the platform could use the same legal basis as transitional articles (or their equivalents) in civil law. This would be a concession to operate over a limited period, during which the supervisor has no formal powers of inspection or oversight. This is not to say that the platforms can operate unchecked, since they are obliged to respond to requests for on-site and off-site information from the supervisor. One mechanism to ensure that the experiment runs smoothly is *Penetration Tests*, which are traditional procedures for systems testing. The procedure allows the supervisor to determine if the platform is vulnerable to any kind of attack or if there are design and management flaws in it. It is recommended, from the outset, to clearly establish with the platforms that this type of testing is to be carried out.
- d. **Final authorization, registration, or licensing:** At the end of the testing period, if the platform's activities are deemed to be subject to control, inspection, or oversight, such authority should be granted. This means that the regulator (often different from the supervisor) will have to issue a specific rule, in which it enables the supervisor to authorize, register, or license companies that in the future want to implement the activities tested in the sandbox. It is important to note that the ultimate aim of the sandbox is to encourage the regulation of innovative activities and, to do so, the powers of regulators must be determined beforehand.

³³In Argentina: the Comisión Nacional de Valores, Superintendencia de Seguros, and Banco Central de la República Argentina; in Chile: Superintendencia de Valores y Seguros, Superintendencia de Bancos e Instituciones Financieras, and Banco Central; in Peru: Superintendencia del Mercado de Valores, Superintendencia de Banca, Seguros y Administradoras Privadas de Fondos de Pensiones, and Banco Central de Reserva del Perú.

4.2 Institutional Capacity

To put sandboxes into practice, adequate institutional support is necessary. Oversight and supervision of its operation require specific organizational, technical, human, and technological capacities, which should be assessed in advance.

4.2.1 Organizational Structure

In most legal systems in LAC, supervisors' powers are strictly defined. This makes it difficult in practice to take on new responsibilities and to assign the necessary organizational resources if there is no prior administrative act authorizing such action.

Lessons learned can be drawn from international experiences, although institutional sandbox models in other countries may not necessarily be applicable in most parts of the region. For example, in the United Kingdom, the legal system is based on common law principles, which allows more space for interpretive work, unlike in Spanish-speaking Latin American countries with a legal tradition overwhelmingly based on civil law. Furthermore, the FCA is an independent public institution with broad powers over prudential regulation and the conduct of financial institutions, which allows flexibility in certain requirements of the firms that are part of the sandbox. However, their counterparts in the region may not have equivalent powers, or there may be several competent authorities involved. A viable alternative for LAC countries would be, within the supervisory bodies and separate from the traditional units, the creation of specialized FinTech-focused entities that carry out the regulatory sandbox functions.³⁴

4.2.2 Technical and Human Resources

FinTech companies have operational particularities that make conventional monitoring models unsuitable for businesses operating in a decentralized manner on a technology platform. The auditing of the FinTech sector requires specific skills and technical

and human resources integrated into multidisciplinary teams, with specialists in areas such as cybersecurity, big data, or artificial intelligence, capable of dealing with emerging risks.

In LAC, regulators and supervisors may not have all the necessary resources to implement sandboxes with assurances. Governments could encourage the provision of required technical and personnel resources through: (i) international assistance and dialogue, and (ii) training policies.

i. International assistance and dialogue

Institutions such as the IDB have become specialized and collaborated with countries in ecosystem identification and formation, as well as development of FinTech regulation. This document is proof of this, as are the Regional Policy Dialogues of the last three years organized by the IDB, which included FinTech on its agenda,³⁵ and the work published so far (see Box 1). It is for these reasons that international assistance, from agencies with a continental or global perspective, is considered to have the potential to ease the work of governments.

The way the public and private sectors are creating spaces for public policy-promoting dialogue, which fosters and incentivizes innovation and pushes toward an appropriate regulatory framework for novel products and services, has been observed in Latin American countries with more developed FinTech ecosystems, such as Brazil, Chile, Colombia, and Mexico. As noted in the IDB and Finnovista report (2017: 87):

“As a result of the dialogue between entrepreneurs and the sector's enterprises, the creation of associations meant to represent the views of this new financial

³⁴ The creation of specialized units outside the regulator or supervisor is an alternative that may prove more difficult and expensive and is therefore not contemplated as a recommendation in this document.

³⁵ For more information, see: <https://www.iadb.org/es/esgdrp>.

services industry before the regulators, boost FinTech knowledge among the general public, and coordinate tasks to bolster better practices in the industry has been promoted. Thus, for example, the Asociación de Fondeo Colectivo (AFICO) in Mexico was established in 2014 (with the support of the Multilateral Investment Fund of the IDB Group), the Brazilian Associação Brasileira de Equity Crowdfunding in 2014, the Asociación Fintech México in 2015, and the Associação Brasileira de Fintechs (ABFintechs) and Asociación Colombia Fintech, both toward the end of 2016.”

It would be best if such initiatives could rely on government support, as they would be able to channel the sector’s demands. The creation of working groups, made up of diverse teams with representation of all stakeholders involved, would make it possible to quickly pinpoint the opportunities and challenges posed by new activities and assess the need to adapt the regulatory framework. Cooperation from industry can make it easier for regulators/supervisors to adopt measures, such as regulatory sandboxes, that promote competition in a secure environment that benefits both business and consumers.

Finally, dialogue can assist in advancing the industry while building capacity among supervisors. There are already many examples of cooperation within the region, such as in Brazil, Colombia, and Mexico.

ii. *Training policies*

A robust FinTech ecosystem is based on four basic features: talent, capital, government policy, and demand (Ernst & Young, 2016). In more developed markets, such as Singapore, the United Kingdom, and the United States, schools and universities are promoting educational programs aimed at engineers, developers, and technicians, with the goal of training qualified personnel and attracting professional talent.

Governments can play a key role in training staff through policies that integrate FinTech’s specialized

Box 1: IDB Publications on FinTech

Publications: The specialized literature produced or sponsored by the IDB includes the general aspects of how the regional ecosystem works (publications i. and ii.), including recommendations on crowdfunding regulation (publication iii.), an overview of the challenges posed by FinTech (publication iv.), and how to get central banks to issue their own digital money (publication v.).

- i. FINTECH: Innovations You May Not Know were from Latin America and the Caribbean: <https://publications.iadb.org/handle/11319/8265>.
- ii. Hitting Stride: The 2nd Americas Alternative Finance Industry Report (in collaboration with the Universities of Cambridge and Chicago): https://www.jbs.cam.ac.uk/faculty-research/centres/alternative-finance/publications/hitting-stride/#.Wr_4i5PwZ61.
- iii. Alternative Finance (Crowdfunding) Regulation in Latin America and the Caribbean: A Balancing Act: <https://publications.iadb.org/handle/11319/7837>.
- iv. Digital Finance: New Times, New Challenges, New Opportunities: <https://publications.iadb.org/handle/11319/8199>.
- v. Digital Central Bank Money and the Unbundling of the Banking Function: <https://publications.iadb.org/handle/11319/7587>.

programs, collaborative agreements with academic and research sectors, and the creation of centers of excellence.³⁶ An example of such an initiative in the region is the FinTech working group recently launched by the IDB in collaboration with the Brazilian Association of Development Banks (ABDE) and the Brazilian Securities and Exchange Commission (CVM) within the Financial Innovation Laboratory framework.³⁷

³⁶ For example, the Monterrey Institute of Technology, in partnership with IBM and the Banorte group, recently unveiled a project to help accelerate digital transformation with the help of the blockchain. <http://eleconomista.com.mx/tecnociencia/2017/06/22/blockchain-une-esfuerzos-banorte-ibm-tec-monterrey>.

³⁷ The Laboratory will focus mainly on: (i) studies and assessments of new financial technologies, the economy, and digital trends, and alternative finance mechanisms (impacts, oppor-

It is worth mentioning that some universities and international study centers are offering specialized online courses in FinTech subjects, which could be considered as an additional potential option. Holding seminars, talks, and dialogues can also be an excellent complement to training specialized personnel. Finally, combining the experience of traditional supervisors and professionals who have been in the business sector can prove to be an additional wager that combines the best of both worlds.

4.2.3 Technological Resources

A segment that is increasingly gaining prominence is the so-called “RegTech,”³⁸ which is based on the use of digital solutions such as cloud technology, big data, or artificial intelligence tools to assist in compliance with regulatory requirements. This has the potential to significantly reduce the time and resources spent on regulatory compliance, risk management (liquidity, market, credit), customer identification processes (“know-your-customer”), and asset laundering prevention controls, among others.

Regulators can also benefit from RegTech solutions to get more accurate, detailed, manageable, and practically real-time data. New technologies make it possible to automate tasks that were previously performed manually, and provide an integrated information overview and automated operations analysis, thus speeding up decision-making and risk control. Therefore, it is very likely that, in the future, we will see widespread use of these tools in the area of monitoring, which will make it possible to simplify and optimize information collection and management processes.

The creation of centers of excellence, together with focused training programs in RegTech, would take advantage of the enormous opportunity offered by technology as a tool to facilitate the work of regulators and supervisors. Finally, cloud computing regulation for the financial sector is a priority, which makes it a FinTech enabler.

4.3 Inter-Agency Coordination

The FinTech sector encompasses various entities, such as banks, financial institutions, technology providers, telecommunications operators, or new companies that carry out activities in different fields such as banking, insurance, and securities.

In countries where there is no comprehensive financial supervisor, it is recommended to set up a committee, with representatives from the different sectors, with authority to admit platforms to the sandbox. For example, a collegiate institution could be set up, in which the presidency alternates annually among authorities.

Since a single activity may fall within the purview of several laws or regulations, inconsistencies or overlapping may occur if proper coordination procedures are not established. Therefore, design communication and information exchange protocols among potentially relevant supervisory bodies are proposed.³⁹

4.4 In the Sandbox: Oversee but Don't Overwhelm

The success of the sandboxes depends, to a large extent, on adequate supervisory mechanisms being

tunities, and challenges); and (ii) design of the proposed joint action on financial technologies, digital economy, and alternative finance mechanisms (governance rules, members, services offered, etc.), including a feasibility study on the implementation of a regulatory sandbox project, which would be the first in Latin America. For more information, see: <http://www.labinovacaofinanceira.com/>.

³⁸ In some studies, the term “SupTech” has been adopted to refer to technological tools used by supervisors. “RegTech” will be used in this text as a broad term covering both meanings.

³⁹ In Singapore, for example, MAS has set up a FinTech Office to foster and promote cooperation arrangements between government agencies and propose common strategies and policies.

in place and the authority responsible for tracking them being able to take corrective action in case of deficiencies that put them at risk. The general guidelines proposed above on entry conditions, platform requirements, and standard procedures, as well as others that may be considered by individual countries, should be objective, transparent, and public.

In order for the experience to be beneficial for all, it is essential that the platforms operate with maximum transparency, interacting directly with the supervisor and trying to reproduce, as much as possible, large-scale market conditions. This requires fluid communication channels that allow information to be sent practically in real time so that the supervisor can evaluate the operation of the sandbox and rapidly make the pertinent modifications.

4.5 Once the Sandbox Is Closed, Sort Out the Market

Once the sandbox has concluded, and in light of the results achieved, it will be possible to assess whether the sector needs to be regulated and, where appropriate, to analyze which regulation model is best suited to the FinTech platforms' particularities.

In some international markets, existing companies have been experiencing difficulties in innovation due to the limitations imposed by the rules to which they are subject. For this reason, banks and other supervised financial institutions have called for "level playing field" rules to be put in place to promote competition and ensure that markets operate efficiently. To this end, regulators should make it easier for any entity seeking to innovate, whether a new entrant or a conventional operator, to find space to explore and test their ideas, with requirements commensurate with the types of products or services they offer.

Excessively rigid regulation, based on entity typology, seemingly is not the most suitable environment for companies engaged in very dynamic business.

Therefore, it would be preferable to adopt a flexible, risk-based approach that considers the size and complexity of activities and enables ongoing adjustment to developments in the sector.

Based on the European Commission's recommendations, three basic principles should underpin the regulatory framework: technological neutrality, proportionality, and market integrity.⁴⁰ Technological neutrality ensures that the same activity is subject to the same regulation, regardless of how the service is provided ("same activity, same risks, same rules"); proportionality considers the business type, volume, and complexity of operations; and integrity prevents new technologies' introduction from disrupting market operation and creating additional risks. Lastly, as the European Banking Authority⁴¹ points out, consumer protection should be added to the three aforementioned principles.⁴²

4.6 Toward a Regional Sandbox: Regulatory Convergence

The FinTech phenomenon transcends national boundaries: according to the same study about the LAC ecosystem (IDB and Finnovista, 2017), of the 393 entities that responded to a survey included in the study, 19.6 percent indicated that they operate in more than one country. Of this subtotal, 35.1 percent are present in two countries, 26 percent in three, 11.7 percent in four, and the remaining 27.2 percent are active in five or more countries.

⁴⁰ https://ec.europa.eu/info/finance-consultations-2017-FinTech_en.

⁴¹ The European Banking Authority (EBA) is an independent European body that works to ensure effective prudential supervision and regulation in the European banking sector. Its objectives are to maintain financial stability in the European Union and safeguard the integrity, efficiency, and orderly operation of the banking sector. <http://www.eba.europa.eu/about-us>.

⁴² Response to the European Commission's Public Consultation on FinTech <http://www.eba.europa.eu/-/eba-responds-to-the-european-commission-public-consultation-on-FinTech>.

International cooperation is essential for sharing expertise and best practices and avoiding situations of regulatory arbitrage. For this reason, this document recommends promoting memoranda or cooperation agreements between authorities in the region. Alternatively, drafting regional or subregional regulatory guidelines for FinTech segments is recommended. This would allow a common framework to be agreed upon jointly, based on general principles, which could then be adapted to each market and legal system of each country and make it easier to set up regional or subregional sandboxes. These would open up markets to FinTech platforms beyond their national borders and allow the sector to advance at the regional level.⁴³

The end goal is to pave the way for regional regulatory convergence. The same applies to the implementation of FinTech regulation in general. Ideally, in the future, such agreements would recognize the validity of authorizations or licenses granted in other markets, making it possible for the platforms to operate in several countries.

This type of cooperation could be extended to other markets beyond the region. Doing so would allow for attracting talent and companies and leveraging the experience of more advanced ecosystems. Cooperation agreements between the United Kingdom and other countries such as Australia, Canada, Hong Kong, Japan, Korea, and Singapore could serve as examples in this regard.

4.7 Additional Recommendations

4.7.1 Innovation Policies

Although it is beyond the scope of this document, government support has been an essential element in bring about progress in innovative sectors. Support from public institutions can help build the confidence necessary for consumers to appreciate and fully embrace the benefits of using new products, applications, and technology platforms. It would, therefore,

be recommended to promote the FinTech sector as part of government innovation policies and to make adequate resources available for its implementation through measures such as:

1. Granting tax incentives to companies and investors.
2. Assistance for financing and investment in entrepreneurs' capital.
3. Technical and legal advice.
4. Creation of innovation spaces or laboratories.
5. Entrepreneurship competitions.
6. Business incubation and acceleration programs.
7. Mentoring practices.
8. Promotion of partnerships and strategic agreements with financial institutions.
9. Creation of FinTech venture capital funds.

4.7.2 Advisory Units

Legal frameworks can stimulate economic activity by establishing unique ground rules that create a level playing field. Regulators and supervisors can contribute to this by providing all the information necessary to understand the regulatory environment and the requirements governing each activity. Initiatives such as setting up advisory units that handle inquiries from entities and help to process the relevant authorizations, as well as publishing guidelines or recommendations, could pave the way for entrepreneurs. Some countries, such as France, the Netherlands, Singapore, Spain, and the United Kingdom,⁴⁴ have already set up specialized FinTech offices or departments within their supervisory authorities, which offer both a venue to meet and assistance if needed. It is recommended that LAC countries make progress along these lines.

⁴³ At the time of this publication, the FCA has even announced the creation of a Global sandbox: <https://www.fca.org.uk/firms/regulatory-sandbox/global-sandbox>.

⁴⁴ <http://goo.gl/ou6eLd>.

CONCLUSIONS

In Latin America, the FinTech sector is making progress in financial inclusion by focusing business models on segments typically overlooked by the traditional banking sector. However, the emergence of new entrants and hitherto unknown activities is posing enormous challenges to the institutions responsible for market regulation and oversight, which must safeguard the interests of all actors while ensuring the stability and confidence of the system as a whole. The pace and scale of change are such that the traditional supervisory models fall short; therefore, it is necessary to establish more flexible formulas that facilitate and foster innovative business activity in a controlled environment with minimal risks.

Regulation can boost creative activity, insofar as it eliminates information asymmetries and establishes clear ground rules that ensure fair conditions, generate confidence, and avoid market distortions. Regulatory sandboxes offer a setting in which entities can test innovative products or services, within a limited scope, before they are offered en masse in the marketplace, while the supervisor monitors their operations. It comes down to having a flexible approach, which allows for individual solutions to be offered and modifications or adjustments to be made, making it an ideal tool for understanding how disruptive and immensely dynamic sectors work. For supervisors and regulators, it is a valuable space for learning, cooperation, and dialogue with firms, where they can analyze how they operate and assess whether new activities need to be regulated or if rules that may hamper innovation need to be changed.

The expansion of FinTech companies is unstoppable across all segments. Governments cannot turn a blind eye to a reality that can deliver tremendous consumer benefits, contribute to economic progress, and become a wealth generator. At the international level, Singapore and the United Kingdom are taking the lead through initiatives that seek to attract innovative businesses, such as the ability to operate temporarily, with minimum requirements, within the regulatory sandbox framework. In Europe, the FinTech phenomenon is a priority area for several entities, and sandboxes are being scrutinized; that said, there has been only modest progress, and European institutions have yet to adopt concrete measures to enable experimentation with new financial products or services. Nonetheless, numerous working groups have been set up in this area, and it is hoped that they will soon produce proposals and recommendations to institutions and governments.

The Singapore and the UK regulatory sandbox experience can serve as a starting point for similar proposals in the LAC region. Implementation should consider the particularities of each market and of the entities offering financial services in them. Successful results can only be achieved if the following elements are clearly defined beforehand: (i) the intended objectives, (ii) the admission criteria for companies and customers, (iii) the limits and parameters of the testing period, (iv) risk protection procedures, and (v) the responsibilities of each party. Furthermore, it is essential that they operate in a transparent fashion, with periodic information reporting and mechanisms

designed to monitor their development and promptly take necessary corrective measures.

LAC countries have a unique opportunity to capitalize on the advantages of using new technologies to boost economic growth in the region. Regulatory

sandboxes can be an efficient and inexpensive way to understand how the FinTech industry works and for adopting the most appropriate regulatory measures to unlock its full potential within a controlled environment, which in turn ensures the system's stability and protects all stakeholders' interests.

REFERENCES

- AFM (The Dutch Authority for the Financial Markets). 2016. The AFM and DNB are easing access to the market with “regulatory sandbox.” Amsterdam: AFM. Available at: <https://www.afm.nl/en/professionals/nieuws/2016/dec/maatwerk-innovatie>.
- Armstrong, P. 2017. Financial Technology: Applications within the Securities Sector. Oslo Børs ASA: Stock exchange and Securities Conference 18 January 2017. Available at: https://www.esma.europa.eu/sites/default/files/library/esma71-844457584-330_speech_FinTech_and_asset_management_by_patrick_armstrong.pdf.
- Arnera, D., J. Barberis, and R. Buckley. 2016. FinTech, RegTech and the Reconceptualization of Financial Regulation. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2847806.
- Australian Securities and Investment Commission. 2017. RG 257 Testing FinTech products and services without holding an AFS or credit licence. Available at: <http://asic.gov.au/regulatory-resources/find-a-document/regulatory-guides/rg-257-testing-FinTech-products-and-services-without-holding-an-afs-or-credit-license/>.
- Badour, A., and L. Fouin. 2017. Canadian Securities Administrators Fintech Initiatives: Regulatory Sandbox and Co-Operation. Available at: <http://www.securitiesregulationcanada.com/2017/02/canadian-securities-administrators-FinTech-initiatives-regulatory-sandbox-and-co-operation/>.
- Bank Negara of Malaysia. 2016. Financial Technology Regulatory Sandbox Framework. Available at: <http://www.bnm.gov.my/index.php?ch=57&pg=137&ac=533&bb=file>.
- BBA and Accenture. 2015. Digital Disruption: UK Banking Report, BBA. Available at: https://www.bba.org.uk/news/reports/digital-disruption-uk-banking-report/#.Wr_1f5PwZ60.
- Castilla-Rubio, J. C., N. Robins, and S. Zadek. 2016. FinTech and Sustainable Development: Assessing the implications. United Nations Program for the Environment. Available at: <http://unepinquiry.org/publication/FinTech-and-sustainable-development-assessing-the-implications/>.
- Digital Finance Institute. 2016. FinTech in Canada. Available at: <http://www.digitalfinanceinstitute.org/wp-content/uploads/2016/09/DFI-and-McCarthy-FinTech-Report-2016.pdf>.
- Dickerson, J., L. Gagliardi, and J. Skan. 2016. FinTech and the Evolving Landscape: Landing Points for the Industry. London, United Kingdom: Accenture LLP. Available at: https://www.accenture.com/t20161011T031409__w__/usen/_acnmedia/PDF-15/Accenture-FinTech-Evolving-Landscape.pdf-zoom=50.
- Dondarski, K., N. Lesser, J. Mulder, C. Terry, and J. Wu. 2014. In the Face of Uncertainty: A Challenging Future for Biopharmaceutical

- Innovation. Deloitte Consulting LLP. Available at: http://www2.deloitte.com/content/dam/Deloitte/lu/Documents/life-sciences-health-care/us_consulting_Inthefaceofuncertainty_040614.pdf.
- Ernst & Young 2016. UK FinTech: On the Cutting Edge. London. Available at: <http://www.ey.com/Publication/vwLUAssets/EY-UK-FinTech-On-the-cutting-edge/%24FILE/EY-UK-FinTech-On-the-cutting-edge.pdf>.
- European Banking Authority. 2017. EBA Response to the EC Consultation Document on FinTech: a more competitive and innovative European Financial Sector. <http://www.eba.europa.eu/documents/10180/187341/EBA+response+to+the+European+Commission+Consultation+Document+on+FinTech+-+June+2017.pdf>.
- The European Commission. 2015. Build a Union of Capital Markets. Green paper Brussels. Available at: <http://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:52015DC0063&from=ES>.
- . 2017. FinTech: A More Competitive and Innovative European Financial Sector. Consultation Document. Brussels: Directorate General Financial Stability, Financial Services and Capital Markets Union. The European Commission. Available at: https://ec.europa.eu/info/sites/info/files/2017-fintech-consultation-document_en_0.pdf.
- European Securities and Markets Authority. 2017. The Distributed Ledger Technology Applied to Securities Markets. Report. Paris: ESMA. Available at: https://www.esma.europa.eu/sites/default/files/library/dlt_report_-_esma50-1121423017-285.pdf.
- EY Global Financial Services Institute. 2015. Financial Regulation of FinTech. Winter 2015, 3 (3).
- FCA (Financial Conduct Authority). 2015a. Innovate and Innovation Hub. London: FCA. Available at: <https://www.fca.org.uk/firms/project-innovate-innovation-hub>.
- . 2015 b. About the FCA. London: FCA. Available at: <https://www.fca.org.uk/about/the-fca>.
- . 2015c Call for Input: Regulatory Barriers to Innovation in Digital and Mobile Solutions. London: FCA. Available at: <https://www.fca.org.uk/publication/call-for-input/call-for-input-regulatory-barriers-to-innovation.pdf>.
- . 2015d. Regulatory Sandbox. London: FCA. Available at: <https://www.fca.org.uk/publication/research/regulatory-sandbox.pdf>.
- . 2016a. Co-operation Agreement (Australia). London: FCA. Available at: <https://www.fca.org.uk/publication/mou/fca-asic-cooperation-agreement.pdf>.
- . 2016b. Co-operation Agreement (Korea). London: FCA. Available at: <https://www.fca.org.uk/publication/mou/fca-korean%20fsc-co-operation-agreement.pdf>.
- . 2016c. Co-operation Agreement (Singapore). London: FCA. Available at: <https://www.fca.org.uk/publication/mou/fca-monetary-authority-of-singapore-co-operation-agreement.pdf>.
- . 2016d. Call for Input on Supporting the Development and Adopters of RegTech. Available at: <https://www.fca.org.uk/publication/feedback/fs-16-04.pdf>.
- . 2017. Regulatory sandbox Lessons Learned Report. Available at: <https://www.fca.org.uk/publications/research/regulatory-sandbox-lessons-learned-report>.
- Financial Services Development Council. May 2017. The Future of FinTech in Hong Kong. *FSDC Paper No. 29*. Available at: http://www.fsd.org.hk/sites/default/files/FSDC_Paper_FinTech_E.pdf.

- Financial Stability Board. 2017. "Financial Stability Implications from FinTech." Available at: <http://www.fsb.org/wp-content/uploads/R270617.pdf>.
- Herrera, D. 2016. "Alternative Finance (Crowdfunding) Regulation in Latin America and the Caribbean." Washington, D.C.: IBD. Available at: <https://publications.iadb.org/handle/11319/7837>.
- Hong Kong Applied Science and Technology Research Institute. 2016. "Whitepaper On DistributedLedgerTechnology." Available at: http://www.hkma.gov.hk/media/eng/doc/key-functions/finanical-infrastructure/Whitepaper_On_Distributed_Ledger_Technology.pdf.
- IDB (Inter-American Development Bank) and Finnovista. 2017. FINTECH Innovations that you may not know were from Latin America and the Caribbean. Available at: <https://publications.iadb.org/handle/11319/8265>.
- International Monetary Fund. 2017. FinTech and Financial Services: Initial Considerations. *IMS Staff Discussion Note N° 17/05*. Available at: <http://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2017/06/16/FinTech-and-Financial-Services-Initial-Considerations-44985>.
- International Organization of Securities Commissions (IOSCO). 2017. "IOSCO Research Report on Financial Technologies (FinTech)." Madrid. Available at: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf>.
- KPMG. 2016. FinTech in India: A Global Growth Story. Available at: <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/06/FinTech-new.pdf>.
- . 2017a. The Pulse of FinTech 4Q16: Global Investment in FinTech. Amstelveen, Netherlands. Available at: <https://home.kpmg.com/xx/en/home/insights/2018/02/pulse-of-fintech-q4-2017.html>.
- . 2017b. The Pulse of FinTech 1Q17: Global analysis of investment in FinTech. Amstelveen, Netherlands. Available at: <https://home.kpmg.com/xx/en/home/insights/2017/04/the-pulse-of-fintech-q1-2017.html>.
- McKinsey and Company. 2016. FinTechnicolor: The New Picture in Finance. Available at: <http://www.the-blockchain.com/docs/FinTechnicolor-The-New-Picture-in-Finance-Mckinsey.pdf>.
- Monetary Authority of Singapore. 2016. FinTech Regulatory Sandbox Guidelines. Available at: http://www.mas.gov.sg/~media/Smart_Financial_Centre/sandbox/FinTech_Regulatory_sandbox_Guidelines.pdf.
- Parker, G., M.W. Van Alstyne, and S.P. Choudary. 2017. Platform Revolution: How Networked Markets Are Transforming the Economy and How to Make Them. New York: W Norton Company.
- PwC (PricewaterhouseCoopers). 2017. Global FinTech Report 2017. Redrawing the Lines: FinTech's Growing Influence on Financial Services. London: PwC.
- Sebastian, J. 2017. Blockchain in Financial Services: Regulatory Landscape and Future Challenges for its Commercial Application. Working Paper. December 2016. Madrid: BBVA. Available at: https://www.bbva.com/wp-content/uploads/2016/12/WP_16-20.pdf.
- Stern, A. 2014. Innovation under Regulatory Uncertainty: Evidence from Medical Technology. Cambridge, MA: Harvard University. Available at: http://www.rotman.utoronto.ca/~media/Files/Programs-and-Areas/Strategy/papers/JMP_Stern_Jan_2014.pdf.
- UK Government Office for Science. 2015. FinTech Futures. The UK as a World Leader in Financial Technologies. Available at: <https://bravenewcoin.com/assets/Industry-Reports-2015/UK-Gov-Fintech-Futures.pdf>.

UN (United Nations) 2017. Request for Information (RFI). Blockchain-based International Assistance. Available at: <https://www.blockchain-expo.com/2017/04/blockchain/un-launches-request-information-blockchain-based-international-assistance/>.

Wardrop et al. 2016. Breaking New Ground: The Americas' Alternative Finance Benchmarking Report. Cambridge, United Kingdom/Chicago, IL: University of Cambridge and University of Chicago. Available at: <https://home.kpmg.com/us/en/home/insights/2016/05/breaking-new-ground-the-americas-alternative-finance-benchmarking-report.html>.

World Economic Forum. 2015. The Future of FinTech. A Paradigm Shift in Small Business Finance. Available at: <http://www3.weforum.org/docs/>

IP/2015/FS/GAC15_The_Future_of_FinTech_Paradigm_Shift_Small_Business_Finance_report_2015.pdf.

———. 2017. World Economic Forum Annual Meeting 2017 Overview. Available at: http://www3.weforum.org/docs/WEF_AM17_Overview.pdf.

Zhang et al. 2016. Pushing Boundaries: The 2015 UK Alternative Finance Industry Report. Cambridge, United Kingdom: The Cambridge Centre for Alternative Finance. Available at: http://www.nesta.org.uk/sites/default/files/pushing_boundaries_0.pdf.

Ziegler et al. 2017. The Americas Alternative Finance Industry Report: Hitting Stride. Cambridge, United Kingdom: The Cambridge Centre for Alternative Finance. Available at: <https://goo.gl/zH7W5H>.

