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Regulatory Sandboxes – Two Perspectives³

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Abstract

A regulatory sandbox is a legal institution that enables business entities to operate in a safe laboratory legal environment to experiment with innovative technologies, products, services or approaches for a specified period of time in a designated part of a sector or area under regulatory supervision. This paper looks at the problem of sandboxes from two perspectives: that of an economist and that of a legal theorist. The authors aim to analyse the overt and covert functions that sandboxes (are to?) actually serve in a pluralistic regulatory system and in the economy. They seek answers to the question of whether regulatory sandboxes are a viable opportunity to support economic innovation and a chance for better quality regulation in the age of the Fourth Industrial Revolution.

Keywords: regulatory sandbox, virtual regulatory sandbox, functions of regulatory sandboxes, regulatory exemption, experimental legislation, experimentation clauses.

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Introduction

In a strict sense, a regulatory sandbox is a legal institution that allows business entities to operate for a specified period of time in a secure laboratory legal environment for the purpose of conducting either virtual or real-world experiments with innovative technologies, products, services or approaches in a designated part of a sector or area under the supervision of a regulator⁴.

In order for regulatory sandboxes to operate legitimately and effectively, special legislation is required to give them legal flexibility, e.g. in a form of so-called *experimentation clauses*, which are temporary provisions that make experimentation possible, or provisions that include authorisations for the regulator to approve certain temporary exceptions to the application of specific provisions of laws. The latter means that the regulator makes an individual decision in which they exclude the application of certain regulations for a certain period of time⁵.

Regulatory sandboxes have emerged in the years in many countries in regulated industries. They are organised in many different ways (e.g. in some countries, the supervision is the responsibility of an independent regulator; in others, the regulator is a minister), affect many economic sectors, and are implemented in a number of manners. Some sandboxes are purely virtual, others operate in a real environment, and their supervision and evaluation of their effectiveness take different forms. They are being implemented in the financial, energy, healthcare, telecommunications, IA, and data protection sectors. Regulatory sandboxes operate in a limited part of a sector or area, often to serve start-ups, enabling them to promote

⁴ “Regulatory sandboxes are defined as concrete frameworks which, by providing a structured context for experimentation, enable where appropriate in a real-world environment the testing of innovative technologies, products, services or approaches – at the moment especially in the context of digitalisation – for a limited time and in a limited part of a sector or area under regulatory supervision ensuring that appropriate safeguards are in place”. Available from: <https://www.consilium.europa.eu/pl/press/press-releases/2020/11/16/regulatory-sandboxes-and-experimentation-clauses-as-tools-for-better-regulation-council-adopts-conclusions/> (accessed: 5.05.2024).

⁵ Excludes the application of regulatory provisions in a particular case, but does not repeal them. Regulator – an independent administrative body that has the power to exercise authority over enterprises in order to create a system effective competition and compensate for its absence or the inability to achieve social purposes under competitive conditions. On regulatory authorities, see: W. Hoff, *Prawny model regulacji sektorowej*, Warsaw 2008; idem, *Polski model regulacji na tle porównawczym*, “Problemy Zarządzania” 2004, 3, pp. 127–138; W. Szydło, *Polskie organy regulacji sektorowej jako instytucje prawa prywatnego*, Wrocław 2019. The term also has a broader meaning: it refers to the “soft law” impact of international actors on enterprises.

innovation while minimising risks to consumers and markets. The European Union used this concept in 2024 in the AI Act⁶.

In addition to regulatory sandboxes in the strict sense (which this paper deals with), economists sometimes also use this term in a broader sense: "If a number of competing companies create a so-called *sandbox* with data properly processed and anonymised so as not to break GDPR rules, which can be accessed by users playing in said *sandbox*, everyone can benefit," write Krzysztof Rybiński and Jarosław Królewski, arguing that "If a company can access twice as much data by creating a sandbox, it does not mean that its analytical potential will increase twice as much. It will grow more because the number of possible relationships between data is growing much faster than the amount of data itself."⁷ "A typical example of such a data sandbox created by similar companies is Biuro Informacji Kredytowej (meaning *Credit & Loan Information Bureau*), which collects data on the credit standing of clients of all banks and makes the data available in a specific form to both banks and their clients."⁸ "In addition to the sand (data), a sandbox features toys (ready-to-use models, including machine learning and artificial intelligence models) that allow sophisticated data analysis."⁹

A regulatory sandbox *sensu stricto* is to serve two main purposes. First, it has a primary goal: to facilitate the development of innovative entrepreneurship. Second, it has a long-term goal: to strategically affect the direction of legal and regulatory policies. Sandboxes, therefore, are to be used not only to create specific areas for testing new products and business models, but also to actively shape the regulatory environment so that it keeps up with the pace of advancement of existing technology.

For this reason, we are considering the problem of sandboxes from two perspectives: that of an economist and that of a legal theorist. We, as the authors of this paper, intend to analyse the overt and – perhaps – covert functions that sandboxes (are to?) actually serve in a pluralistic regulatory system from the perspective of legal theory. On the other hand, there is also a goal of a closer examination of the functions they (are to?) serve in the economy (economic perspective). Are they a real opportunity to support economic innovation and a chance for better regulation? Or is it more of a legal and economic ephemera?

⁶ Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts. Available from: <https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX:52021PC0206/> (accessed: 5.05.2024).

⁷ K. Rybiński, J. Królewski, *Algokracja. Jak i dlaczego sztuczna inteligencja zmienia wszystko?*, Warsaw 2023, p. 186. Sandboxes understood in this way lie outside the scope of this paper.

⁸ This sandbox was created by law, not by agreement of the banks, see: *ibidem*, p. 187.

⁹ *Ibidem*, p. 188.

A sandbox serves to create a neutral environment in which a business entity can design and present its innovative business model and consult it with the regulator. Such “regulatory exemptions” apply to specific entities and are granted for a limited period of time¹⁰. When engaging in a dialogue with the regulator, each sandbox participant (there may be, for example, dozens of them) can identify potential legal and regulatory barriers to implementing their business idea, and design – together with their lawyers and in consultation with the regulator – optimal solutions to such legislative, regulatory, or interpretative problems¹¹. The regulator, having the results of the sandbox experiment, assesses the risks of specific projects and systemic risks, i.e. the impact of possible changes in the law and regulations on the legal environment of a given market¹². On this basis, the regulator may (but does not have to) call for changes in the law or make changes to existing regulations if they have the power to do so. Yet, it is never certain if the change in a particular case occurs. There are many interests to consider in the legislative process and the outcome of the initiatives undertaken can never be determined in advance. It may be enough to merely propose a new interpretation of existing law. Then, once out of the sandbox, business entities will only receive interpretation-related guidance on how to understand and construe the applicable regulations.

Legal and economic context – general remarks

There are many theoretical and legal sandbox-related problems that deserve to be examined in more detail. For example: will a sandbox actually serve to prevent sham or misguided regulations? How does the issue fit into discussions concerning the fuzziness of the legal system, its openness and transparency, equivalent institutional normative orders, and legal pluralism? Do regulatory sandboxes guarantee legal certainty? Are they able to make the legal system more ‘homeostatic’? Do sandboxes make it possible for new technologies and businesses to flourish while preserving important human rights and the rule of law?

¹⁰ B.R. Knight, T.E. Mitchell, *The sandbox paradox: Balancing the need to facilitate innovation with the risk of regulatory privilege*, “South Carolina Law Review”, 2020, 72(2), pp. 445–476; S. Philipsen, E.F. Stamhuis, M. Jong, *Legal enclaves as a test environment for innovative products: Towards legally resilient experimentation policies*; “Regulation & Governance” 2021.

¹¹ Law and regulations – in this paper, regulations are understood as normative acts from public regulators who do not have the constitutional power to legislate, and law means constitutional sources of law and their interpretation.

¹² Changes in the law – changes in the text (content) of regulations or changes in the interpretation of regulations.

When addressing the future of optimal types of regulation for emerging technologies, William D. Eggers, Mike Turley, Pankaj K. Kishnani list regulatory sandboxes as one of six important regulatory tools alongside adaptive regulation, outcome-based regulation, risk-weighted regulation, and collaborative regulation¹³.

In the case of sandboxes, the process and effect of creating a rational legal framework for the introduction of innovative technologies, products, services, and models into the economy can be the result not only of traditional, stable, and certain legislation and other regulations, but also of another initial state: the incorporation of legal provisions containing *experimentation clauses* into normative acts – including legal provisions authorising an authority named in the relevant law or a public regulator to approve certain temporary deviations from the application of specific provisions of laws. The disproportion between the rate of technological transformation of the economy and the achievable pace of legislative change is forcing a new approach to regulation – the idea is now to act *ex ante*, not *ex post*, which has been the usual approach so far¹⁴. Initial states are the various conditions faced by business entities intending to achieve a goal. The end result will be to achieve the goal not following one traditional route, but through various legal and regulatory paths – including an alternative, experimental route using a friendly regulatory sandbox to test new technologies, solutions, and services before launching a full-scale, real business¹⁵. The regulator determines the conditions, time, and area of sandbox operation, as well as the associated regulatory facilities. They also define the requirements and criteria for entering and exiting the sandbox.

From an economic perspective, this is a problem, because the global economy is still largely stuck in the outdated management systems, often established even 200 years ago. Innovators are working under great pressure, in a maze of a multitude of risks, uncertainties, contradictions, and opacity, as “new technologies have been welded onto the old order in disarray and haste.”¹⁶ It is often for regulators

¹³ See: W.D. Eggers, M. Turley, P.K. Kishnani, *The future of regulation Principles for regulating emerging technologies*, “Deloitte Insights” 19.06.2018. Available from: <https://www2.deloitte.com/us/en/insights/industry/public-sector/future-of-regulation/regulating-emerging-technology.html/> (accessed: 5.05.2024).

¹⁴ EU Council press release of 16 November 2022. Regulatory sandboxes and experimentation clauses as tools for better regulation. Available from: <https://www.consilium.europa.eu/pl/press/press-releases/2020/11/16/regulatory-sandboxes-and-experimentation-clauses-as-tools-for-better-regulation-council-adopts-conclusions/> (accessed: 5.05.2024).

¹⁵ S. Ranchordás, B. van Klink (eds.), *Experimental Regulations and Regulatory Sandboxes – Law Without Order?*, “Law and Method” 2021, 12, <https://www.lawandmethod.nl/tijdschrift/lawandmethod/2021/12/lawandmethod-D-21-00012> (accessed: 5.05.2024); J. Truby, R.D. Brown, I.A. Ibrahim, O.C. Parellada, *A Sandbox Approach to Regulating High-Risk Artificial Intelligence Applications*, “European Journal of Risk Regulation” 2022, 13, pp. 270–294. Available from: https://ris.utwente.nl/ws/files/304762207/a_sandbox_approach_to_regulating_high_risk_artificial_intelligence_applications.pdf (accessed: 5.05.2024).

¹⁶ D. Tapscot, A. Tapscot, *Blockchain Rewolucja*, Warsaw 2019, p. 134.

to still try to manage through rules dating back to the Industrial Revolution. “In New York State, money transfer laws date back to the Civil War, a time when the main means of transportation was the horse and carriage” – Don Tapscott and Alen Tapscott wrote in 2019¹⁷.

Markets are not stable, nor are they self-improving. The technological revolution, digital economy, artificial intelligence are ahead of the efforts of legislators and regulators. Lawmakers, bound by complex legislative procedures, find it impossible to keep up with the pace of changes occurring on a global scale.

Some historical milestones

Here are some legal and economic facts from the history of regulatory sandboxes, illustrating the development of the trend:

- 2012 – the world’s first regulatory sandbox (Fintech) in the US¹⁸,
- 2015 – the UK; the first regulatory sandbox project in Europe in the FinTech sector¹⁹,
- 2018 – the Fintech sector in Poland; the beginning of the works on the Regulatory Sandbox, which is managed by the Polish Financial Supervision Authority (KNF)²⁰,
- 2019 – the initiative aimed at launching the Fintech sandbox project in Poland is suspended²¹,
- 2020 – a new project is launched in Poland: Virtual Sandbox PSD2, serving to test selected payment services²²,
- 2020 – World Bank publishes its findings: in the financial innovation (FinTech) sector alone, there are 73 sandboxes in 57 countries worldwide²³,

¹⁷ Ibidem.

¹⁸ K. Fal, *Instytucja piaskownic regulacyjnych jako instrument wspierający innowacyjność gospodarek*, “Business Law Journal” 2022, 10, p. 38.

¹⁹ A. Butor-Keler, M. Polasiak, *The role of regulatory sandboxes in the development of innovations on the financial services market: the case of the United Kingdom*, “Ekonomia i Prawo” 2020, 19(4), pp. 621–638.

²⁰ <https://fintech.gov.pl/pl/komunikaty/303-aktualnosci-artykuly/679-urząd-knf-uruchamia-piaskownice-regulacyjna-knf/> (accessed: 5.05.2024).

²¹ Ibidem.

²² https://www.knf.gov.pl/dla_rynku/fin_tech/Piaskownica_Wirtualna (accessed: 5.05.2024).

²³ The World Bank, *Global Experiences from Regulatory Sandboxes*. Available from: <https://documents1.worldbank.org/curated/en/912001605241080935/pdf/> (accessed: 5.05.2024).

- 2023 – European Commission launches a regulatory sandbox for innovative DLT use cases²⁴,
- 2023 – KNF, in cooperation with the Polish Central Securities Depository (KDPW), launch the DLT (blockchain) Virtual Sandbox²⁵,
- 2023 – the institution of regulatory sandbox is incorporated into the Polish legal system by an amendment to the Energy Law passed by the Polish Sejm²⁶,
- 2024 – the AI Act mandates the creation of regulatory sandboxes at the national level to facilitate the development and pre-market and real-world testing of innovative artificial intelligence systems²⁷.

A normative sandbox model – an example

The specific legal arrangements for sandboxes around the world are not identical, although the principles are very similar. This is a matter for a separate comparative treatise. In view of this, limited by the framework of this paper, we will take a closer look at one model – the latest regulatory sandbox, which was incorporated into the Polish legal system by amending the Energy Law in 2023.²⁸

The normative (reconstructive) process (dynamic) model of this sandbox is as follows.

- I. An act containing standards for deviation from the application of certain laws is enacted

In the Energy Law Act, the legislator gives the regulator (in Poland – the President of the Energy Regulatory Office) the power to grant certain types of entities exceptions from the application of the regulations indicated in the decision within the framework of the regulatory sandbox. The entity

²⁴ <https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Sandbox+Project> (accessed: 5.05.2024).

²⁵ <https://fintech.gov.pl/pl/komunikaty/303-aktualnosci-artykuly/1275-urząd-knf-we-współpracy-z-kdpw-uruchomil-piaskownice-wirtualna-sandbox-dlt-blockchain> (accessed: 5.05.2024).

²⁶ J. Uryniuk, *Żegnajcie marzenia o budowie w Warszawie fintechowego centrum Europy. KNF zakopuje piaskownicę regulacyjną*. Available from: <https://www.cashless.pl/5548-piaskownica-regulacyjna-warszawa-koniec/> (accessed: 5.05.2024).

²⁷ Regulation of the European Parliament and of the Council laying down harmonised rules on artificial intelligence (Artificial Intelligence Act) and amending certain Union legislative acts. Available from: <https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3A52021PC0206/> (accessed: 5.05.2024); J. Gołaczyński, X. Konarski, *Geneza, cele uchwalenia oraz najważniejsze zasady Aktu o usługach cyfrowych, "Prawo Nowych Technologii"* 2023, 3–4, pp. 9–21.

²⁸ Article 24d of the Act of 28 July 2023 on amending the Energy Law Act and certain other acts, *Journal of Laws of the Republic of Poland of 2023, item 1681*.

that then makes the specific decision on the exemption is not the Sejm, nor is it another state body with the power to legislate, but the regulator – directly supervising this market.

II. The regulator organises a design procedure

The regulator announces and conducts a design procedure (at least once a year).²⁹

III. The business entity draws up a relevant request

The business entity prepares a request for a decision to create a regulatory sandbox – to be submitted to the regulator. The request needs to contain arguments on how the project will contribute to the achievement of the state's energy policy goals, a discussion of the expected benefits of the project, and a description of the existing regulatory barriers preventing the project from being implemented if a regulatory exemption is not granted.

IV. The request is submitted to the regulator

The business entity submits a reasoned request to the regulator for an exemption from the application of the regulations specified in the request.³⁰

V. The regulator evaluates the request

The regulator evaluates the request, including the opportunities and risks posed by the project, and may require the entity to submit an independent expert report by a competent state research institute, engineering and technology university, or other specialised entity independent of the requesting entity.

VI. The regulator makes a decision

The regulator makes either approves or rejects the request. In a decision to grant an exemption from the regulations specified in the request, the regulator also sets the duration of the project (no more than three years) and specifies the conditions for implementing the project.

VII. The business entity operates in the regulatory sandbox within the designated period

²⁹ The ERO President posts a design procedure guide in the Public Information Bulletin of the Energy Regulatory Office.

³⁰ Exemptions may concern: 1) the obligation to provide the President of the Energy Regulatory Office (ERO) with a Grid Code referred to in Article 9g (8) for approval, provided that the entity's activities within the scope of the decision referred to in section 1 do not involve establishing interconnections with other countries; (the regulator grants exemption from the statutory obligation by way of a decision issued under the relevant law. This is not *lex specialis*, because there is no intention to repeal the regulations, the regulator gets the authority to decide on the exemption from a statutory obligation); 2) the obligation to agree on the draft plan referred to in Article 16 section 13 with the President of the ERO; 3) the conditions for obtaining and engaging in licensed activities referred to in Article 32 and Articles 35-37; 4) the obligation to submit a tariff referred to in Article 47 section 1 to the President of the ERO for approval if the requesting entity is not a distribution system operator.

The goal is to accumulate knowledge and experience under the constant supervision of the regulator. The entity is also required to electronically inform stakeholders who may be affected by the project of the experimental nature of the project prior to its implementation.

VIII. Permanent dialogue

During sandbox operations, the business entity and the regulator maintain a regular dialogue. The business entity carries out its information and reporting obligations. The entity reports to the regulator, provides explanations regarding the implementation of the project, informs the regulator of any changes in legal or factual circumstances relevant to obtaining an exemption.

IX. Submission of the final report

The business entity submits a final report to the regulator – a report with the conclusions drawn from the completed projects and evaluating the impact of the granted exemptions on their business operations.

X. The regulator evaluates the report and takes action – if necessary

The regulator's evaluation of the project outcomes results in conclusions and possible action. First, the regulator can draft changes in their regulations; second, the regulator initiates changes in the law, submits legislative demands to the lawmaker; third, the regulator does not demand changes to be made in the law, but only suggests changes in the interpretation of the law. Another possible scenario is also one where the regulator takes no action at all.

Exemptions from the application of regulations and experimentation clauses

Sandboxes were first introduced in only a few countries, but the European Union very quickly found it an interesting regulatory tool³¹. The EU Council argues that “regulatory sandboxes can provide the opportunity to advance regulation through proactive regulatory learning, enabling regulators to gain better regulatory knowledge and to find the best means to regulate innovations based on real-world evidence, especially when a medicinal product is at a very early stage of development. This can be particularly important in the face of high uncertainty and disruptive challenges, as well as when preparing new policies.”³²

³¹ https://ec.europa.eu/info/publications/science-research-and-innovation-performance-eu-2020_en/ (accessed: 5.05.2024).

³² European Commission, Tool #21: Research and Innovation, Better Regulation Toolbox; European Commission; 6783/20 (COM (2020)103). Available from: <https://www.prawo.pl/akty/dz-ue-c-2020-447-1,69394224.html/> (accessed: 5.05.2024).

Laws in which the legislator gives the regulator the authority to grant certain types of entities derogations from the application of the provisions indicated in the decision within the framework of the so-called regulatory sandbox can be considered provisions containing experimentation clauses within the meaning of the EU Council³³. “Experimentation clauses, often the legal basis for regulatory sandboxes, are defined as legal provisions which enable the authorities tasked with implementing and enforcing the legislation to exercise on a case-by-case basis a degree of flexibility in relation to testing innovative technologies, products, services or approaches.”³⁴

Experimentation clauses are understood to be “temporary provisions to enable experimentation.”³⁵ An aspect worth emphasising here is that it is not a legal construct to grant the regulator the power under an act to grant certain types of entities exemptions from the application of the provisions indicated in an individual administrative decision. It is a different institution of empowering either the legislature or the regulator to establish episodic regulations. Episodic regulations (rather than administrative decisions) include solutions that introduce exceptions to specific regulations, the duration of which is clearly defined. Episodic regulations modify previously existing regulations for a limited period of time. Thus, there is a fundamental difference between a provision of an act containing the authority for a regulator to decide to deviate from the application of existing law and an episodic provision of an act.

The former does not abolish the validity of norms, but only excludes the application of regulations, which is decided by the regulator – not the legislative body – by way of an individual decision; and the latter enables the legislator to abolish the validity of certain regulations for a certain period of time, thus establishing modified regulations.

In the case considered above, the grounds for the sandbox are the authority given under the law to the President of the Energy Regulatory Office to grant certain entities exceptions from the application of the regulations indicated in a given decision. This legal solution has been used for a long time in Polish law and recog-

³³ See: Council Conclusions on Regulatory Sandboxes and Experimentation Clauses as tools for an innovation-friendly, future-proof and resilient regulatory framework that masters disruptive challenges in the digital age. The conclusions were adopted on 16 November 2020, no. 13026/20, Official Journal of the EU C 447/1. Available from: [https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:52020XG1223\(01\)/](https://eur-lex.europa.eu/legal-content/PL/TXT/PDF/?uri=CELEX:52020XG1223(01)/) (accessed: 5.05.2024); https://ec.europa.eu/info/publications/study-supporting-in-terim-evaluation-innovationprinciple_en/ (accessed: 5.05.2024).

³⁴ Council Conclusions..., p. 151

³⁵ See: <https://klasterwodorowy.pl/piaskownica-regulacyjna-a-rozwoj-rynku-wodoru,292,pl/> (accessed: 5.05.2024).

nised in the EU, although it was not previously associated with sandboxes³⁶. The institution of exemptions from technical conditions, in the light of the economic and technological changes taking place and with the constancy of legal regulations, was already acknowledged many years ago (it was also applied in the People's Republic of Poland) as necessary for the effective functioning of various economic processes³⁷.

For a long time, such exemptions have meant that certain rules or regulations are not taken into account at the stage of conducting experiments.³⁸

In a broader sense (i.e. without limiting the considerations to regulatory sandboxes only), it is assumed that experimental regulations can be applied to grant exemptions from existing rules or in the context of decentralisation of powers³⁹. In the former case, a relevant act allows regulators to temporarily waive one or more specific regulations in order to test the effectiveness of alternative provisions. In federal and decentralised systems, on the other hand, legal experimentation can also take place by decentralising the power to experiment with either state or local laws.

What is the nature of the traditional institution of regulatory exemption used in Polish law? A minister's act is "an atypical internal administrative act, which is neither an administrative decision nor an order," argue Tomasz Asman and Zygmunt Niewiadomski, analysing the Polish building law⁴⁰.

However, there is a dispute among Polish legal scholars, academics, and commentators over the opinion of the form of this exemption. There is a view that this is

³⁶ For example, see Article 24f. Granting an exemption from the requirements for safety conditions in a tunnel, Act of 21 March 1985 on Public Roads, Journal of Laws of the Republic of Poland of 2024, item 320; quotation: "The province governor, pursuant to Article 9 of the conditions and procedure for deviating from the technical and construction regulations of the Act of 7 July 1994 – Building Law, at the request of the tunnel manager, may grant an exemption from the requirements of the technical and construction regulations on safety conditions in the tunnel in case there is a possibility to use technical solutions with higher safety parameters."

³⁷ M. Sabalski, *Odstępstwa od warunków technicznych regulacji ustawy prawo budowlane i ustawy o transporcie kolejowym*, "Zeszyty Naukowo-Techniczne SITK RP, Oddział w Krakowie" 2011, 158. See: the exemption in the Act of 7 July 1994 – Building Law, Journal of Laws of the Republic of Poland of 1994 no. 89, item 414, Article 9

³⁸ An example from Germany: the clause contained in Section 7(2) of the Carriage of Passengers Act: "In order to allow for the practical testing of new modes or means of transport, the licensing authority may, upon request on a case-by-case basis, authorise exemptions from the provisions of this Act or from provisions adopted on the basis of this Act for a maximum period of four years, insofar as they do not conflict with public transport interests". Available from: <https://www.bmwk.de/Redaktion/EN/Dossier/regulatorysandboxes.html#:~:text=Regulatory%20sandboxes%20enable%20in%20a,%20sector%20or%20area> (accessed: 5.05.2024).

³⁹ M.A. Heldeweg, *Legal regimes for experimenting with cleaner production – Especially in sustainable energy*, "Journal of Cleaner Production", 2017, 169, pp. 48–60.

⁴⁰ Z. Niewiadomski (ed.), *Prawo budowlane. Komentarz*, Warsaw 2018, p. 165.

a decision on issues arising in the course of the proceedings within the meaning of the provisions of the Code of Administrative Procedure (Article 123 et seq.) and a view that the matter of exemptions is resolved before the issuance of the construction permit, so it is a prior ruling. Thus, it is a decision that resolves the case on the merits (Article 104 of the CAP)⁴¹.

Also, there is a special case of creating a sandbox by devolving legislative powers. Experimentation by devolution requires either state authorities or supranational bodies to authorise local government bodies (local authorities) to establish regulations for a specific area of significance to the experiment. As a result, decisions can be made at the local level – with local preferences and needs in mind. This solution plays a special role in federal states.

Sandboxes in different countries differ in the types of authorisations, the procedure for exemptions, the range of impact, the industry, the timing of the experiment.

First, there are countries with exemption systems called ‘choose from menu’. The legislator offers entrepreneurs intending to operate within sandboxes a range of regulations from which they can choose specific standards from which they would like to be exempted during their ‘sandbox time’.

Second, many countries do not have this type of ‘menu’. The innovator submits a request for exemption from self-selected standards and norms, which they find to be posing an actual hindrance that makes it impossible or highly difficult to test their innovation. They submit their request to the legislator (or another authority) with a description of the goals, the process, the expected results, the duration of the experiment, and the sample size.

Sandbox tests can take from one (e.g. in the case of many projects in the Fintech sector in Australia) to ten years (e.g. in the energy sector in the Netherlands); this period can usually be extended. Moreover, in the EU, exemptions from obligations imposed under its primary or secondary legislation are possible only when the EU law clearly provides for such an option.

Sandbox organisers, infrastructure operators, accelerators (e.g. attracting entities to take part in sandbox projects), applying and testing entities (they do not have to be the same entities) have different tasks resulting from various types of normative acts (e.g. executive acts to the AIA or sets of rules and terms and conditions)⁴².

⁴¹ Ibidem, p. 168. There are also rulings of the Supreme Administrative Court concerning this subject, such as the judgement of the Supreme Administrative Court of 24 March 2000. IVSA 1940/99, *Legalis*; decision of the Supreme Administrative Court of 5 May 2003, IV SA 2481/01 *Legalis* – but this remains outside the framework of this paper; it is material for a separate study.

⁴² E.g. see: Regulamin Platformy Sandbox Blockchain, issued by Fundacja KIR na Rzecz Rozwoju Cyfryzacji Cyberium, based in Warsaw. Available from: <https://www.sandboxblockchain.pl/regulamin/> (accessed: 5.05.2024).

In the area of IT, sandboxes are virtual. They are separate, isolated environments designed to test software, making it possible to avoid threats of occurrence of undesirable, adverse effects on devices or the network⁴³. In 2023, the European Commission launched a regulatory sandbox for innovative DLT use cases.⁴⁴ This sandbox is open to business entities from all sectors as well as to public entities working on designs that are already beyond the concept verification stage and are close to market launch or at an early stage of use and operation. When it comes to participation in the sandbox, priority is given to mature ideas, which involve legal and regulatory issues of greater (broader) significance.

In 2023, the Polish Financial Supervision Authority (KNF), in cooperation with the Polish Central Securities Depository (KDPW), launched the DLT (blockchain) Virtual Sandbox.⁴⁵ Enterprises operate in a virtual environment, so they do not have the ability to offer products to customers/clients (even with their permission)⁴⁶. They use computer simulation. The legislator did not make it possible for the KNF to rescind or limit the obligations or administrative burdens imposed on entrepreneurs wishing to offer financial services by way of a decision⁴⁷. This is different from the energy sandbox model outlined above. Test participants using the Virtual Sandbox gain access to an IT infrastructure that allows them to verify their business ideas under controlled conditions of the test environment. The sandbox enables them to simulate multiple banking operations and test solutions based on the Open API, which is compliant with the Polish API standard.

The model of the latter sandbox consists of the following stages:

- I. The entrepreneur applies to the Innovation Hub programme⁴⁸,
- II. Consultations with the KNF,
- III. The entity qualifies (or not) for the testing stage,

⁴³ The World Bank, *Global Experiences...*, p. 1.

⁴⁴ <https://ec.europa.eu/digital-building-blocks/wikis/display/EBSI/Sandbox+Project> (accessed: 5.05.2024).

⁴⁵ <https://fintech.gov.pl/pl/komunikaty/303-aktualnosc-artykuly/1275-urząd-knf-we-wspolpracy-z-kdpw-uruchomil-piaskownice-wirtualna-sandbox-dlt-blockchain> (accessed: 5.05.2024).

⁴⁶ A technology sandbox intended to simulate a real operating environment where entrepreneurs can test services using blockchain technology created by PKO BP Bank with other entities was also designed for the virtual environment only.

⁴⁷ K. Mokrzycka, *Trzy piaskownice do testowania rozwiązań fintechów w sześć miesięcy – zapowiada UKNF*, <https://300gospodarka.pl/news/trzy-piaskownice-do-testowania-rozwiazan-fintechow-w-szesc-miesiecy-zapowiada-uknf-wywiad/> (accessed: 5.05.2024); M. Rojszczak, *Sztuczna inteligencja w innowacjach finansowych – aspekty prawne i regulacyjne*, "Internetowy Kwartalnik Antymonopolowy i Regulacyjny" 2020, 2(9). Available from: <https://ikar.wz.uw.edu.pl/images/numery/65/00.pdf/> (accessed: 5.05.2024).

⁴⁸ Innovation Hub – as part of this programme, the KNF engages in a dialogue with FinTech, SupTech, and RegTech players.

- IV. The tests last a maximum of 90 days in a virtual environment simulating selected financial market operations,
- V. Access may be extended for 30 days,
- VI. The participant independently analyses the conclusions drawn in the course of the consultations and tests and, on the basis of these, decides whether or not to apply for an operating permit⁴⁹.

It's easy to see the differences between the organisation principles of this sandbox and the energy sandbox covered above.

In 2024, the AI Act mandated the creation of regulatory sandboxes at the national level to facilitate the development and pre-market and real-world testing of innovative artificial intelligence systems.⁵⁰ This will allow innovative AI systems to be developed and tested before being marketed. EU Member States are required to establish at least one AI regulatory sandbox at the national level, which should be operational no later than the date of application of the relevant regulation⁵¹.

A virtual environment makes it possible to operate on fictional data or create a simulator that works on real data, but in an isolated process (in an alternate reality, so to speak). There are also sandboxes where innovations are tested in a real-world environment. In such cases, tests are carried out on specific subjects to check the real behaviour and reactions of the environment.

An important thing to stress is that sandboxes are different from business incubators and business accelerators. Accelerators and incubators provide the market with technological know-how to support innovation. A regulatory sandbox, in turn, gives access to a ready-made virtual or real-world environment in which solutions can be created and tested. This makes it possible for innovators to try out and verify their ideas.

Functions of regulatory sandboxes

The term “regulatory sandbox” is, of course, a metaphor, and metaphors do not have a single meaning. Nevertheless, “playing in a sandbox,” where one can use

⁴⁹ https://www.knf.gov.pl/dla_rynku/fin_tech/Piaskownica_Wirtualna (accessed: 5.05.2024); see in detail: https://www.knf.gov.pl/knf/pl/komponenty/img/Regulamin_udzia%C5%82u_w_testach_%C5%9Brodowisku_Piaskownicy_Wirtualnej_UKNF_71769.pdf (accessed: 5.05.2024).

⁵⁰ <https://www.europarl.europa.eu/topics/en/article/20230601STO93804/eu-ai-act-first-regulation-on-artificial-intelligence/> (accessed: 5.05.2024).

⁵¹ K. Wiaderka, *Piaskownica regulacyjna jako instrument wspierania innowacji w zakresie sztucznej inteligencji*, “Prawo Mediów Elektronicznych” 2023, 2.

toys (test programmes) and build sandcastles (innovative products) – but under the careful supervision of parents (regulators) – describes this concept well. The sandcastles must be stable, solid, but they can be easily rebuilt, and their design and structure can be consulted with parents.

From a legal perspective

The law has a stabilising function and aims to bring a sense of security and order. At the same time, through changes in content, it makes the transformation of community life more dynamic. The law also serves a protective and organisational purpose, as well as a repressive and educational purpose. Each of these purposes can be served by a well-organised regulatory sandbox. A dynamic feedback loop between the needs of innovators, regulations, and law should allow rapid adaptation of norms to social and economic change. It should protect business entities from outdated regulations that do not keep up with innovation and technology, and help establish flexible rules for cross-border coordination between the multi-layered patchwork of regulations of different states. It can also provide tips in terms of interpretation. Sandboxes also have a preventive effect, protecting businesses from possible violations of the law. For instance, in the case of start-ups, administrative penalties that can be imposed on them at the beginning of their operations generally put an end to their operations (they may be listed on the public warning list) – and tests teach how to act to avoid serious risks.

The final legislative outcomes depend to a large extent on the professionalism, commitment, and political will of the regulator, the situation in the legal, political, and economic system, and – ultimately – on the will of the legislature, which will recognise (or not) the significance of the evidence the regulator presents and be willing (or not) to support new business models.

As a result, it is possible to establish new laws, amend regulations, fill various structural gaps, remove ambiguities in the law and eliminate contradictions in existing norms, as well as modify any extra-legal regulations⁵². The conclusions drawn may also address changes in the interpretation of laws and other regulations. Sometimes it is enough to improve the interpretation – especially by advocating for a more thorough functional interpretation. In many cases, the innovative technologies and business models being tested are not addressed by existing laws and

⁵² M. Będkowski-Kozioł, *Piaskownice regulacyjne w energetyce – kilka uwag w odniesieniu do projektowanych rozwiązań prawnych*, "Energetyka Rozproszona" 2022, 7, pp. 19–27; S. Ranchordás, B. van Klink (eds.), *Experimental Regulations and Regulatory Sandboxes – Law Without Order?*, "Law and Method" 2021, 2, pp. 1–23. Available from: <https://www.bjutijdschriften.nl/tijdschrift/lawandmethod/2021/12/lawandmethod-D-21-00012.pdf/> (accessed: 5.05.2024).

regulations at all. Then, as a result of the tests, draft regulations can be drawn up with the near future in mind.

Cross-border sandboxes, meaning ones involving close regulatory cooperation between two or more neighbouring states, are of particular interest in Europe.

The primary purpose of some of the sandboxes being launched is legislative: the aim is for the legislature to verify the impact of a draft new regulation on the regulated market. This will allow it to be ‘tightened’ and improved before applying it to the entire market⁵³. The regulations tested within the sandbox are intended to help determine the most appropriate framework for the new law. Test testing entities work, first and foremost, for the common good. For example, the energy sandbox described above is an example of a thematic sandbox focused on supporting solutions in one specific sector⁵⁴. It may also occur that sandboxes are used by entities that have created innovative products, services, etc. in a ‘legal void’. This could be a boost for legislation. On the other hand, in the absence of regulations, entities tend to investigate what solutions will enable them to legally market a product or service here and now.

Sandboxes can be evaluated from the perspective of different values of the law.

The law should be clear, predictable, consistent, so that business entities in a particular situation in which they would like to exercise their rights know what rules to follow.⁵⁵ Can legal experiments, decisions by regulators to grant exemptions, compromise this value? A good answer to this question requires a detailed analysis of the legal basis and regulations of each regulatory sandbox project. The principle of equality also matters in this context. It will not be violated as long as the experimental nature of the sandbox is defined transparently, remains public, the conditions are regulated precisely, and given the expected effects – the risks are proportional to the expected benefits.

From an economic perspective

An economic analysis of the operation of specific sandboxes in the context of possible accusations calls for a different approach. And these accusations may be grounded, first, on restricting market competition by giving preferential treatment to those who have benefited from the sandboxes in question, and second, on allegations that the principle of equality among economic players is violated in practice.

⁵³ After: K. Fal, op. cit., p. 38.

⁵⁴ K. Fal writes about the four types, *ibid*, p. 41.

⁵⁵ P. Popelier, *Five paradoxes on legal certainty and the lawmaker*, “Legisprudence” 2008, 2(1), pp. 47–66. The Dutch Council of State has repeatedly expressed concern about the potential tension between experimental legislation and the principle of legal certainty.

Considering the close cooperation between private businesses and regulators, there is also some risk that the boundaries of public and private interests may begin to blur.⁵⁶ Too close a relationship between start-ups and regulators during an experiment may result in a desire to provide the former with additional support once they leave the sandbox. This threatens the principle of equality.

A sandbox can be more than just a platform for testing regulations (overt function). It can also be used to lobby for regulatory solutions needed by a particular business to achieve its goals (covert function).

Regulatory sandboxes are also criticised because of the poorly developed scientific methodology for their creation and operation, the unusual, case-specific nature of the tests, and the limited significance of the results achieved⁵⁷. Hypothetically, it is also possible that the decisions to create sandboxes and how to use the results generated therein may become political. Economists are investigating the hidden reasons behind the premature termination of some sandboxes or the exit of innovators from them.

Many attempts to launch sandboxes around the world have failed. Sandbox projects would be shut down because they did not produce measurable results or were considered to have been poorly designed. The first attempt to launch a sandbox under the supervision of the Financial Supervision Authority in Poland (in 2018) also failed. The economic purpose was important: due to the UK's exit from the European Union, the centre of new technology was no longer London, and many fintechs were looking for a new location.⁵⁸ The Polish fintech community had hoped that the establishment of a regulatory sandbox in Warsaw would increase Poland's chances of creation of a European centre for new financial technologies. Unfortunately, it didn't work out. There are many different reasons for the failure, including political, organisational, and personnel-related factors.

Sandboxes have only been established for a few years now, so there is a lack of systematic and in-depth scientific research on them. There are also exceptions, such as the interesting results obtained by Patrick B. Washington, Shafiq Ur Rehman, Ernesto Lee, who studied in detail 24 digital banks in the UK. The study reviewed the digital banks' adoption of a regulatory sandbox to foster innovation in the financial sectors. The findings clearly showed that regulatory sandboxes

⁵⁶ S. Philipsen, S. Stamhuis, E.F., Jong, op. cit., p. 80.

⁵⁷ Ibidem, p. 85; S. Omarova, *Technology v Technocracy: Fintech as a Regulatory Challenge*, "Journal of Financial Regulation" 2020, 6(1), pp. 75–124.

⁵⁸ Lithuania laid the foundation for such a location.

had a detrimental effect on the financial performance of these banks, increasing compliance and efficiency costs on their part.⁵⁹

Sandboxes should offer a way to improve the protection of values important to the modern economy and make the organisation of economic life better. Each enterprise has a demand-related, supply-related, and social function to perform. It is assumed that an entrepreneur, when testing innovative solutions in a sandbox, learns how to do business, how to comply with regulations, tests the potential of using a given technology without some of the constraints of existing regulations. An entrepreneur understands all the limitations and opportunities and works with their lawyers to influence the regulator in such a way as to obtain favourable solutions. Some sandboxes are mainly about seeing how regulatory conditions that lower the entry threshold for new technologies should be prepared, and about testing them under controlled conditions close to typical, real-life conditions. In such sandboxes, innovation comes to the foreground.

Regulatory sandboxes can indeed also offer a special opportunity for innovators to learn about very complex regulations (e.g. GDPR, antitrust). A business entity tests solutions in the friendly environment of a regulatory sandbox, and at the same time gains precise knowledge of what obligations they must face once they leave the sandbox, i.e. what the situation of innovation would be if there were no special exemptions. Once out of the sandbox, the entity can carefully design further undertakings to avoid regulatory obstacles.

Sandboxes should have the advantage of institutionalising and, at the same time, humanising the cooperation between innovators and regulators, as well as reducing the potential administrative burden involved in future administrative proceedings due to improper implementation of a given innovation⁶⁰. During a sandbox programme, there is more interaction between entrepreneurs and the regulator. For instance, regulators may consult the participating entities regarding the guidelines on how specific regulations should be applied to new products and services, which aims to e.g. make the interpretation of the law easier.⁶¹ A time well spent in a sandbox can also translate into a shorter time to market a product or service.

Thanks to sandboxes, supply should grow as well. Regulatory sandboxes (should) contribute to the promotion of new solutions across markets – during and after the testing stage. After all, their goal is to bring tangible benefits in an innova-

⁵⁹ P.B. Washington, S.U. Rehman, E. Lee, *Nexus between Regulatory Sandbox and Performance of Digital Banks – A Study on UK Digital Banks*, "Journal of Risk and Financial Management" 2022, 15(12), p. 610.

⁶⁰ A. Piotrowska, *Administracja dialogu – o nowych metodach administrowania w relacji organ–przedsiębiorca*, Acta Universitatis Wratislaviensis, issue 3977, Prawo CCCXXIX, Wrocław 2019.

⁶¹ K. Wiaderka, op. cit., p. 80.

tive economy. Many companies want to use sandboxes to evaluate the consumer appeal and profitability of their business models. Testing in a real-world environment offers a good understanding of the reception of new technologies among consumers (e.g. will investors be eager to buy real estate tokens?). A sandbox can also help develop business models that better protect consumers.⁶²

There can be no doubt that the main macroeconomic objective of sandboxes is to accelerate the development of specific sectors of the economy by facilitating the market launch of innovations.

The main overt legal and economic purposes are aligned, but their fulfilment depends on many contextual, political, organisational, and social factors.

The questions that remain are the following: will the entrepreneur take steps to innovate after the experiment is over? Here, there is no certain answer. Will the regulator take steps to improve regulations or initiate changes in the law? This depends on e.g. possible changes in decision-making positions in companies and regulatory authorities, changes in general economic policy in the country, changes in strategy within the company, changes in the economic environment, approval or lack of interest among the target consumer audience, axiological conflicts and fear of a technological revolution, the quality of final reports, and many other factors. Thus, there is no certainty that an experiment that even produced measurable and clear results (presented in the final report) will have any effect on legislation, regulations, and the economy in general. For now, it is too early to determine systemically if and where this mechanism is going to work. If the current projects are not closed, it will only be a few years before we can see the first Polish designs emerge from their sandboxes. Sandboxes also have a social purpose, teaching employees how to implement innovations. Businesses using a regulatory sandbox should cooperate with regulators – including by adhering to the guidelines set by the latter – and take prompt action in good faith to mitigate any risks to safety and fundamental rights that may arise in the course of developing their products, services, and conducting experiments within the sandbox.

Sandboxes can also become platforms for controlled and transparent lobbying – unlike the traditional methods used by lobbyists, there emerges an environment in which dialogue between an entrepreneur and a regulator is not only possible, but expected and welcome. This means dialogue based on ‘live’ solutions, tested together, and translating into proposals for regulatory changes that will enable the development of a specific activity. The added value of sandboxes is the possibility to collectively assess the impact of regulatory changes, often based on real

⁶² W.D. Eggers, M. Turlry, P.K. Kishnani, *op. cit.*

market data. This, in turn, should give greater comfort and security to public administration institutions in making decisions or planning regulatory strategies.

But there are also numerous questions that arise. How to eliminate the risk of sandbox abuse as regulators inevitably lower requirements to attract innovators? How to guarantee data protection during testing if it involves the use of real data? How to eliminate breaches or sandbox security workarounds? How to eliminate fraud, such as conducting tests of third-party solutions or testing on behalf of third parties? How to ensure supervision over the sandbox software installed?

Final remarks

Do these relatively new legislative solutions, which aim to remove regulatory barriers considered to hinder innovative projects, actually create legally and regulatory-friendly environments for testing specific innovative solutions? Will they be unobtrusive enough to be used in business to a greater extent?

Should the legislator create lists of exceptions to regulations in advance? Or should it be the entity requesting to join the sandbox who should name the regulations they find burdensome and address the regulator with a request for an exemption before entering the sandbox? Who (the legislator, the regulator or perhaps the entrepreneur) will be better able to identify legal or non-legal regulations that need to be modified due to the emergence of new business solution projects and, in extreme cases, identify legal obligations that are excessive to the achievement of the regulatory intent of the legislator before entering the sandbox? Will the sandboxes be transparent?

Once the experiment is over, another crucial question appears: will the regulator actually act for the regulatory changes and will their actions be effective?

There is no guarantee that the experiment will have any effect on legislation. Thus, it is reasonable to design a systematic study of the exit phase in sandboxes and of the activity phase of the regulator and innovators after the experiment. When will it be realistically possible to evaluate the impact of the sandboxes? In particular, it will necessary to see whether there has been a reduction in the regulatory burden as a result of the effects achieved.

Regulatory sandboxes are a few steps beyond what a traditional approval of exemption offers. Traditional deviations serve clear individual economic purposes. Now, given all the structural and procedural elements of the sandboxes, the main goal is different: it is the general optimisation of the law for the economy.

When evaluating the legal solutions and attempts made to date, we can consider the gaining of knowledge by legislators and regulators on how to design the optimal

regulatory (procedural and supervisory) framework for innovation to be the primary, main function of sandboxes. The enabling of specific entrepreneurs to check the regulatory conditions for specific innovations (a function for the economy) is a function placed in the background, although the online marketing for sandboxes suggests otherwise. The third significant function is an active form of dialogue between regulators and entrepreneurs. Stimulating regulatory dialogue is a socially important aspect of sandboxes.

Even if the tests are carried out correctly, the reports show how to improve the law, and the regulator announces the intention to change the law after gaining relevant regulatory knowledge, the success of the sandbox is still uncertain. No path has been designed from the final report to the bill drafting stage, which means that the results of experiments can get stuck and eventually lost in office archives.

Perhaps it would be reasonable to define the conditions for sandbox experiments in advance, and if these conditions are met, the regulator would be obliged to proceed to make adjustments in the regulatory solutions. Such boundary conditions would let the entrepreneur act with more certainty when starting their creative work within the created sandbox, allowing them to commit more resources in anticipation of positive results of the efforts undertaken in a controlled environment and scalability of the designed solutions once the boundary conditions are met and regulatory changes are implemented by the regulator.

It is also necessary to supplement the theoretical-legal perspective of the study of the legal system with a deeper, more extensive analysis of experimental regulation and regulatory exemptions as a result of the creation of regulatory sandboxes. The legal order is multi-layered, and real regulatory pluralism operationally co-shapes the features and qualities of the legal institutions subject to study.⁶³

It is necessary to conduct further research 'from the inside' on how sandboxes work and 'from the outside' in the context of the regulated economy and legislation.

In particular, it is necessary to highlight the growing power of regulators from the perspective of legal and economic theory and philosophy as they are becoming increasingly important actors of non-political power – and to reveal the details of the mechanisms of the experiments in which they participate.

⁶³ Law in the operational sense: all rules that affect the decisions regarding the application of the law. Cf. J. Wróblewski, *Obowiązywanie systemowe i granice dogmatycznego podjęcia do systemu prawa*, "Studia Prawno-Ekonomiczne" 1986, 36.

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