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## **Innovation Monsters in the Sandbox**

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**Abstract**

Recent technological advances, from artificial intelligence to genome editing, are made into *innovation monsters*, that is, demonstrable objects of public admiration or public fear, which do not exist without being displayed, are connected with anticipations of progress or catastrophe, and cause pervasive uncertainties about their future evolutions. In this paper, I investigate the politics of innovation monsters by analyzing recent manifestations of the regulatory sandbox. Heralded by innovation enthusiasts across the globe, many regulatory sandboxes aim to tame innovation monsters. In doing so, they also trust innovation to provide relevant answers to public problems. Other regulatory sandboxes illustrate a shift from a concern with containing risks to the imperative to realize the potential of innovation by suspending the rules suspected to restrain its progress. It feeds an understanding of policy as innovation-based. This innovation-based policy makes innovators central political actors and innovation the engine of permanently destabilized policy action.

*Keywords:* regulatory sandbox, innovation, disruption

## Innovation Monsters in the Sandbox

### Introduction

Recent technological advances, from artificial intelligence to genome editing, create monsters of anxiety or hope. Discourses of revolutionary interventions in society and the very fabric of human lives abound, immediately echoed by voices of caution, if not sheer panic in the wake of promised technological disruption. The dialogue between promises and fears is itself caught in wider dynamics of speculation and struggle for funding and attention. This makes it unsurprising that those alerting decision-makers and the wider public about the dangers of new technologies may well be the same people who actively work for developing them, as the recent public interest in artificial intelligence amply demonstrates. In a world where the language of revolution is widespread, where novelty is a resource for convincing investors and attracting public interest, technological advances are made into *innovation monsters*, that is, demonstrable objects of public admiration or public fear, which do not exist without being displayed (*monstratus* in latin), are connected with anticipations of progress or catastrophe, and cause pervasive uncertainties about their future evolutions<sup>1</sup>.

What are the implications of making certain things into innovation monsters?

Answering this question means problematizing the fascination for the public display of novelty, exploring its practical manifestations, and analyzing connections with wider understandings of the relations between innovation and society. An anthropology of innovation monsters can look at the investment or policy devices that seek to turn technological advances into vehicles of impatient expectations or collective anxieties. It can explore the ways in which the exceptionality of innovation is cultivated and brought to public light. It can (and probably should) illuminate what the fascination for or fear of innovation monsters entail for how we think about desirable collective choices and desirable social order.

To do so, one can search for the empirical sites where novelty is at stake, *not* to decipher what is new and what is not, but to explore the practice of making novelty a public priority and for what consequences. I focus here on recent manifestations of the *regulatory sandbox*, a concept initially originating in finance that designates a bounded testing space with tailored regulatory conditions under the eyes of external publics. Heralded by innovation enthusiasts across the globe, the regulatory sandbox is an ideal locus for observing how innovation monsters are made and by whom, how they are controlled and assessed, and how they serve as vehicles for promoting visions of the role of innovation in society.

As they argue for the need to test technology in controlled conditions, proponents of the regulatory sandbox see it as a way to make tamed innovation monsters for safe public display. In doing so, they see the state as lagging behind innovation. When colleagues and I studied the spread of the regulatory sandbox in France, we met policy-makers who were less concerned about controlling than freeing innovation from what they defined as regulatory constraints. They envisioned what we called an *innovation-based policy*, in which all policy domains would welcome innovation monsters and be open to constant disruption (Doganova et al., forthcoming). I will show that this way of promoting innovation introduces fragility at the heart of public institutions even as it produces fragile innovation monsters.

### Taming Innovation Monsters

After the financial crisis, the regulatory sandbox appeared as a way to test financial innovation in controlled conditions and to avoid the global effects that had propagated

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<sup>1</sup> When he urged political ecologists to “love their monsters,” Bruno Latour invited them to pay analytical and political attention to the many attachments that bring technology and society together. Latour’s monsters are the heterogeneous associations that actor-network theory powerfully brought to light (Latour, 2011; Law, 1991). By contrast, the contemporary innovation monsters functioning within an economy of (positive or negative) anticipation have explicit extraordinary characteristics that are designed for public display.

throughout the economy at large. In 2017, two specialists of the financial sector described it as follows:

A regulatory sandbox is a framework set up by a financial sector regulator to allow small scale, live testing of innovations by private firms in a controlled environment (operating under a special exemption, allowance, or other limited, time-bound exception) under the regulator's supervision. (Jenik and Lauer, 2017: 1)

In this description, designing a regulatory sandbox is about taming innovation monsters, trusting the regulator's ability to control what innovation could become. The tailored conditions of the sandbox then offer the experimental conditions that are necessary to test innovation as well as the existing regulatory framework and its potential adaptations.

Policy-makers introduced regulatory sandboxes in finance in the UK and the approach quickly spread, geographically, and beyond finance. One example among many can be found in the European Commission's 2021 proposal for a regulation "laying down harmonized rules on artificial intelligence", quickly nicknamed the "AI act." The AI act gives member states the possibility to establish regulatory sandboxes before putting new technologies on the market. Echoing the definition introduced by proponents in the financial sector, the proposed regulation considers that testing innovation in regulatory sandboxes is part of "evidence-based regulatory learning", whereby monitored testing offers a way to "gather reliable and robust data." "Evidence" is a key term here, which signals the need to demonstrate that risks are known and duly controlled before innovation can spread beyond the walls of the sandbox. Evidence is also about regulation itself, and the fact that it needs to be "simpler and better" based on measurable elements —a central element of the overall *Better Regulation* approach that the European Commission promotes.

This theme is visible beyond the EU. "Test how the regulatory framework is operating in practice and illuminate unnecessary barriers to innovation that need to be addressed" is listed as an objective in a document outlining several options for regulatory sandboxes in AI written by the UK Department for Science, Innovation & Technology and tellingly entitled *A pro-innovation approach to AI regulation* (Secretary of Science, Innovation & Technology, 2023). The UK Human Fertilisation & Embryology Authority adopted a similar reasoning when it recommended using a regulatory sandbox to explore the use of genome editing techniques in human embryos. In a 2022 publication, it again used the language of fostering innovation while evaluating risks in controlled condition, thereby "encouraging innovation while minimizing risks" (HFEA, 2022: 3).

This latter illustration of the current interest in regulatory sandboxes caused a telling critical reaction on the California-based Center for Genetics and Society's blog. The HFEA proposal was described as an attempt by "enthusiasts" to "make heritable genome editing seem inevitable by focusing on the processes of approval and oversight" (Shanks, 2022). This reaction offers a lens for us to understand the politics of making tamed innovation monsters in regulatory sandboxes. It leads us to ask questions such as: Who defines what to control and how? How to evaluate the test and its consequences? What room is there for going back if the evidence is negative or inconclusive and who gets to say so?

These questions point to the legal conundrum that control and monitoring inevitably entail, especially for technologies, like digital or genetic technologies, that are designed to spread. They show that making tamed monsters in regulatory sandboxes implies turning large-scale questions of *why?* and *for what?* into questions of *how?* and *with what acceptable risk?* These sandboxes are not only about trusting the regulatory oversight of a controlled test. They are also about trusting innovators to choose the right technological path. They are inscribed within a "law lag" narrative that sees technology as an inescapable force to which regulation can only adapt. This narrative does not account for innovation dynamics and the very active role of public bodies, particularly in AI (Dozema and Frahm, 2023). It also reinforces the role of scientists and innovators who are in charge of identifying and promoting technology, and then are well placed to advocate for self-restraint and oversight. As Ben Hurlbut discusses in the case of genome editing, this is no innocent move. Instead, the language of law lag and necessary oversight naturalizes the inevitability of technological progress, to which society can only be responsive (Hurlbut, 2015).

These considerations lead to a deeper understanding of the politics of making tamed innovation monsters, pertaining to how society understands its relationship with innovation. Recent comparative works show that this question receives different answers across the globe, and that it is tied to national institutional constructs (Pfotenhauer and Jasanoff, 2017). When we worked on innovation policies in Singapore, colleagues and I met proponents of the regulatory sandbox in finance and in other domains as well, such as energy and health. We analyzed these interventions as manifestations of a broader understanding of the city-state as a “test-bed island” for experimenting with technologies, reliant on legal exemption deeply rooted in policy practices (Laurent et al., 2021). In Europe, detailed analysis of the AI act has discussed the legal issues that the practices of exemption in and control of regulatory sandboxes would raise (Buocz et al, 2023). The problematic nature of the legal norm across the diverse European regulatory landscape is another manifestation of the obstacles that the European dreams of harmonization through science and the market face when confronted with the messiness of technical objects (Laurent, 2022). Here again, making innovation monsters in the sandbox offers an empirical entry point to understand the situated inscription of innovation in social life.

### **Taming monsters or freeing innovation?**

After having encountered the regulatory sandbox as an innovation device in Singapore, my colleagues and I followed it in France. A series of policy initiatives have introduced their own version of the device, referred to in the literal French translation as *bac à sable réglementaire*. One of these initiatives is *France Expérimentation*, a public body meant to promote innovation that uses catchy taglines such as “experimenting for innovation” or “unleash to innovate”. On its website, *France Expérimentation* directly targets innovators:

‘Your company faces legal obstacles? Call France Expérimentation!’

‘Do you have an innovative project that faces regulatory constraints? See our call for projects!’

This blunt language is telling. *France Expérimentation* is situated within a general enthusiasm for innovation, voiced by government officials. In 2018, Mounir Mahjoubi, the newly appointed Secretary of State for Digital Affairs in the wake of the recent election of Emmanuel Macron, was thrilled to tweet that:

“Experimenting by departing from an existing regulation or law is now possible with the new France Expérimentation scheme!”

This description of the French version of the regulatory sandbox did not insist on control and monitoring. It focused much more on freeing innovation from a regulatory framework imagined as a set of constraints imposed on innovators. Instead of claiming to tame innovation products seen as potentially monstrous because of their potential impacts, *France Expérimentation* would welcome projects that were exciting because their existence could only occur in uncharted regulatory terrain outside of the existing legal realm. Rather than lagging behind technological advances and trying to adjust to it, the role of the state would be to lift regulatory constraints strategically to facilitate innovation.

Since the creation of *France Expérimentations*, various French public bodies have introduced other regulatory sandboxes. Many projects have been conducted, for instance about the use of hospital waste for energy production, the use of recycled water in public swimming pools, or the injection of methane in gas pipes. Some of these projects have been led by start-ups and individual entrepreneurs. Others, like methane injection, by large-scale energy or IT companies seeking to advance new technological developments. Yet for all their differences, these initiatives share a common reference to the innovator as a reliable source of desirable public initiative, and to the state as in charge of lifting regulatory constraints.

While the idea of the sandbox, a safe space for children to play, evokes tamed monsters, its manifestation in our empirical investigations in France brings new imaginaries to the fore, in which what matters is less control than disruption. This theme is present in the discourse of sandbox proponents elsewhere. “If we don’t disrupt ourselves other will do it”, one of our interviewees in Singapore told us. This signaled that the current of anxiety running among regulatory sandbox’s proponents may not always be about the unintended

consequences of innovation. Instead, the public presentation of *France Expérimentation* displays another kind of anxiety, that of not being innovative enough, of suffering from an “innovation deficit” that would deprive public bodies of the relevant solutions to complex social and economic problems that only innovators supposedly offer (Pfotenhauer et al., 2019).

This anxiety and its manifestation in the French regulatory sandboxes we have been studying are not innocent. They result in implicit theories of innovation and the state, whereby the former is at risk of being hindered by the latter. “The first thing the regulator should do for innovation is doing nothing”, the president of the Regulatory Authority for Electronic Communications said when launching the regulatory sandbox of the Authority. For him, “doing nothing” meant preventing regulatory constraints from hindering innovation, yet also making sure that regulators come as close as possible to innovators.

This way of understanding the relationship between innovation and the state was not an isolated initiative when Mahjoubi heralded the value of the French version of the regulatory sandbox. *France Expérimentation* had been created in 2012, well before the election of Macron, within a general interest of the French public administration for innovation that diagnosed a need for the state to not only foster innovation but also to transform itself to become innovative. A way of doing so has been offered by the “state start-ups” (*Start-ups d’Etat*), which are led by small teams of civil servants and private experts adopting entrepreneurial approaches to public problems, and are meant to turn regulators into innovators.

Soon after he was nominated by the newly elected Emmanuel Macron, Mahjoubi was said to “embody the *Start-up Nation*” —an English expression that became closely associated to Macron’s vision of the desirable French society. The owner of economic journal *Challenges* publicly declared that Macron “made him think of a unicorn” (Mundubeltz-Gendron, 2018). Journalists compared the new president and his close associates with start-upers and innovators because they supposedly rewrote the rules of politics and disrupted the established allocation of power between traditional political parties, a theme that Macron and his followers had been prone to use. In May 2018, Mahjoubi again brought public attention to *France Expérimentation* when he visited VivaTech, a Paris-based technology conference self-described as “the world’s rendezvous for startups and leaders to celebrate innovation”, and placed it within other pro-innovation initiatives. One of them is the French Tech Mission, whose director said in a public interview that she ambitioned to “put the State at the service of entrepreneurs, as close to them as possible and throughout the country” and “make France one of the most attractive countries in the world for start-ups, talent and investors”.

In this broader landscape of the public promotion of innovation both within and outside the French public administration, regulatory sandboxes are not just bounded zones to display the products of innovation for future users and for regulators expected to adapt their rules. They are components of a more general spectacle of innovation, whereas French society is supposed to transform itself and become attractive for “start-ups, talent and investors”.

### Regulatory Oddities

Mounir Mahjoubi left the government in 2019, and rarely spoke about the actual productions of the French regulatory sandboxes. Yet the implications of his enthusiasm for innovation were clear for the many skeptical observers of the would-be Start-up Nation. On Twitter, one reaction among many to Mahjoubi’s brash announcement about “departing from an existing regulation” reads as follows:

I created a start-up around a great innovation: a total, systemic and incomparable herbicide-fungicide. Well, it hasn’t been tested on bees yet, but I’m sure it will be fine.

Can I break the laws and regulations and put it on the market?

This reaction to the broad considerations about turning France into a Start-up Nation brings innovation monsters back in the picture, those that the regulatory sandbox would inevitably fail to contain in a world where innovation would be unleashed from any regulatory oversight. If the regulatory sandbox promises to free innovation from its regulatory shackles, it cannot pretend to serve as a well-controlled experimental ground anymore. No longer tamed, the innovation monsters in the French sandbox would be designed to run away.

The humorous reaction above has another layer. The anxiety about the monstrous “incomparable herbicide-fungicide” is also ironic: will actual innovation monsters emerge from the sandbox? Or are they interesting for the likes of Mahjoubi as mere promises, valuable more for their demonstrative value than their actual realizations? If so, the herbicide-fungicide reaction signals that innovation would be monstrous less for its material productions than for its vision of the desirable society displayed to national and foreign publics.

In our empirical explorations of the French regulatory sandboxes, colleagues and I saw that the promise of freedom for innovation from regulation encountered the reality of the tight entanglements between technological and regulatory initiatives. In the spring of 2023, I attended a meeting during which public health experts were discussing a project for a simplified water filtration treatment submitted to *France Expérimentation*. The project proposed an innovative water filtration system that could be used in public swimming pools if exempted from water quality rules. In a context of public concerns about water scarcity, elected officials supported the project and promises of quick authorizations had been made. For members of the public body to which the experts belonged, however, public health rules could not be easily lifted, and there were scientific examinations that were not optional.

*France Expérimentation* promises to create zones of exemption, but the initiative is caught in a dense net of rules and legal standards it does not have the power to change. This means that the promise of speed and efficiency results in practice in lengthy negotiations between various public bodies. Delineating what legal rules are malleable and what should remain the same is a matter of contention. The rules of *France Expérimentation* explicitly exclude certain regulatory constraints from exemption request (there will be no fiscal exemptions), yet the water filtration example shows that there is much uncertainty about what legal requirements can (or should) be lifted.

The empirical investigation of sandboxing practices displays the ambiguities that stem from the encounters between broad talks of innovation and the practicalities of bureaucratic discussions. These ambiguities sometimes stem from the fact that law is less an obstacle than nonexistent. When new frequency ranges or energy technologies are tested, regulatory provisions are not lifted but co-written between regulators and innovators. In all cases, the promise of the French regulatory sandboxes is that regulators and innovators will come together to adapt the law to innovation’s needs. This makes the sandbox projects regulatory oddities, often seen with skepticism in many corners of the public administration and with uncertain bureaucratic futures.

The regulatory oddities that emerge from the French sandboxes raise issues about health and environmental risks, but also legal ones. Civil servants such as the public health experts discussing the innovative filtration system raise legal quandaries about risks and liabilities. Deeper constitutional issues regularly emerge. The government website *viepublique.fr* reminds its readers that equality under the eye of the law is a “constitutional principle” in France, enshrined in Article 6 of the *Déclaration des droits de l’homme et du citoyen*, which states that “law is the same for everyone, whether it protects or punishes.” How to reconcile this constitutional principle with the fact that legal exemptions are supposed to be granted to some and not others, that legal writing becomes a collaborative work between public and private actors expected to benefit certain innovators, possibly at the expense of others?

*France Expérimentation* considers that the regulatory exemptions it grants for a given project can benefit *every* innovator in similar situations. This provision may seem largely theoretical considering that the sandbox is supposed to offer conditions tailored to the need of individual innovators. A similar approach proved problematic for other reasons in the regulatory sandbox of the *Commission de Régulation de l’Énergie* (Regulatory Energy Commission). In 2021, nine projects had been conducted in the CRE sandbox, and seven were related to methane injection in gas networks. Would the multiplication of exemptions carved out in the regulatory net end up destabilizing it and result in *de facto* generalization? Without clearly answering this question, the CRE regulators seemed to identify its importance, when they stated in a July 2021 deliberation that CRE could refuse certain experiments “in case too many similar derogations were asked for”.



The French regulatory sandboxes aim to displace the legal fabric, welcome instability and result in products that are often contested and with uncertain regulatory futures. They introduce fragility at the heart of public institutions even as they produce fragile innovation monsters. Fragility acquires a constitutional quality here. It is a desirable characteristic of legal frameworks understood as obstacles to eliminate, and an inevitable consequence of the fact that sandboxes create regulatory oddities of uncertain futures. As such, the French regulatory sandboxes are vehicles of *constitutional fragility*, at both institutional and material levels. They may include safeguards and control mechanisms, but their evaluation is often ambiguous, and they are never presented as preliminary steps meant to gather evidence before decisions are made. What matters in these regulatory sandboxes is their contribution to a broader mobilization of innovation as a central component of policy intervention. Here, innovation is called to permeate all domains of public policy, citizens and civil servants are asked to become innovators, and legal production is understood as collaborative work between innovators and regulators. All this results in an imagination of social order in which innovation ought to be protected from the strength of the law, and in which, by contrast, public rules cannot remain stable and must permanently adapt to innovation needs. The permanent fragility of both legal norms and sandboxed projects displace the policy implications of the regulatory sandbox. No longer a component of evidence-based policy, it becomes a path to envision what my colleagues and I call an *innovation-based policy* to characterize a style of policy-making within which all domains of policy action ought to be transformed by innovation (Doganova et al., forthcoming).

### **From Innovation Monsters to Innovation-Based Policy**

How to analyze the political implications of the fascination for or fear of innovation monsters? I have proposed to study the sites meant to turn innovation into objects of public display in order to explore their political implications, and focused on the regulatory sandbox, a bounded testing space with tailored regulatory conditions under the eyes of external publics. By providing testing grounds in controlled conditions, the regulatory sandbox is an instrument for making tamed innovation monsters. Many regulatory sandboxes in artificial intelligence and genome editing include these tamed innovation monsters in a broader understanding of technological development, seen as an inevitable force to which society needs to adapt. When colleagues and I studied the diffusion of the regulatory sandbox in France, we encountered initiatives that did not seek to tame innovation monsters but to free them. Rather than promoting innovation by offering controlled space of experimentation, these regulatory sandboxes seek to free innovation from a regulatory framework imagined as a set of constraints. The designers and proponents of these sandboxes are less concerned about the impacts of innovation than excited when innovation comes to life in uncharted regulatory terrain outside of the existing legal realm.

These sandboxes illustrate a style of policy-making in which innovation ought to permeate all policy domains, and, accordingly, the role of the state is not just to finance or provide favorable conditions for innovation to thrive, but to be constantly ready to disrupt itself. No longer bounded places for admiration, fear and control of innovation monsters, regulatory sandboxes become instruments for constantly tearing apart, weaving and reweaving the fabric of the state around innovation. Within this innovation-based policy, the products of innovation are regulatory oddities and remain fragile creatures of uncertain futures. Here, innovation becomes monstrous less because of its tangible production than because of the vision of the desirable society it leads to: a society in which innovators are the main political actors and innovation the engine of permanently destabilized policy action.

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