

## ARTICLES

### INNOVATION EXPERIMENTALISM IN THE AGE OF THE SHARING ECONOMY

by  
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*Conventional wisdom says that innovation is fundamentally at odds with the regulatory state: It is a gift of a handful of lonely geniuses that need to be unchained from state control and its rigid and obsolete regulations. The “innovation state” is “no country” for old rules. More recently, this claim has been heard in the debate on the regulation of sharing-economy platforms that defy, for example, existing hotel and transportation regulations with an allegedly new concept of shared services. However, few scholars would seriously argue that the state should completely abdicate all responsibility for regulating innovation. Therefore, this Article suggests that the heart of the matter is not whether the state should be “in” or “out” of the innovation game, but rather when and how it should be involved. Drawing on examples from the sharing economy and the literature in law and technology, this Article addresses the timing of this state intervention, suggesting the use of experimental and sunrise regulations. When regulators are unable to make informed predictions about innovative products, they should consider limiting the territorial scope of application of a new rule, timing its duration, or*

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*delaying its commencement date. This can be achieved with temporary and experimental rules, which can be tested and reviewed on a systematic basis, or sunrise clauses, which delay the coming-into-effect of certain regulatory dispositions.*

*In this Article, I argue that experimental regulations and pilot projects can adequately respond to some of the challenges posed by on-demand economy platforms such as Uber and Airbnb. This experimental approach, already visible in some American (e.g., Portland) and European cities (e.g., Leeds and Manchester) embraces innovation while balancing its risks and opportunities. In other cases, I contend that regulators should not rush into the enactment of temporary or permanent regulations. Instead, the promulgation of regulations should be delayed to a later stage when more information about an innovative product becomes available or when the technology itself is widely commercialized (e.g., disruptive digital platforms, social robots, driverless cars). When the development of a forthcoming technology might be a potential source of risks, sunrise clauses defining the legal constraints (e.g., safety measures) to be considered by innovators, can give time to innovators to adjust to such rules without constraining innovation.*

INTRODUCTION .....	873
I. UNDERSTANDING INNOVATION .....	877
A. <i>Definition</i> .....	878
B. <i>Characteristics of Innovation</i> .....	882
1. <i>Uncertainty</i> .....	883
2. <i>Diversity and Institutional Complexity</i> .....	886
II. INNOVATION AND THE STATE.....	888
A. <i>Innovation Without the State: The Myth</i> .....	890
B. <i>Regulation Stifling Innovation</i> .....	893
C. <i>The State as the Innovator</i> .....	898
1. <i>The State Solving Market Failures</i> .....	902
2. <i>The State as the Framers of Innovation</i> .....	903
III. TIMING REGULATORY INTERVENTION .....	907
A. <i>Innovation Experimentalism</i> .....	908
1. <i>Background</i> .....	908
2. <i>Experimental Regulations</i> .....	912
3. <i>Temporary Regulations and the Sharing Economy</i> .....	917
B. <i>Sunrise Clauses</i> .....	920
CONCLUSION .....	924

The PC industry is leading our nation's economy into the 21st century.

There isn't an industry in America that is more creative, more alive and more competitive. And the amazing thing is all this happened without any government involvement.

—Bill Gates, 1998<sup>1</sup>

## INTRODUCTION

We love innovation.<sup>2</sup> We always have. It got us out of our caves, it makes us live longer and healthier, and it materializes our endless ability of self-improvement.<sup>3</sup> And in the age of the sharing economy, innovative sharing platforms (often in the form of smartphone applications) allow us to unlock and drive our neighbor's car for a small fee (e.g., Get-Around), rent our closets to strangers (e.g., Tradesy), and obtain a less-onerous loan from a peer (e.g., Lending Club).<sup>4</sup> In the age of the sharing economy, what is mine is yours—but only for a fee (and a good peer-review).<sup>5</sup> While we value innovation, the role of the state has become particularly controversial in the case of the sharing economy, where the peer-to-peer element and the alleged-trust basis of these collaborative practices have challenged the traditional role played by regulation in the innovation process. Invoking the idea of equality of parties (peer-to-peer) and the feedback or reputational instruments as control mechanisms,<sup>6</sup> a

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<sup>1</sup> See LINDA WEISS, *AMERICA INC.? INNOVATION AND ENTERPRISE IN THE NATIONAL SECURITY STATE I* (2014) (explaining that “Bill Gates’s ‘state-less’ depiction of America’s high-tech economy perfectly captures the prevailing understanding of U.S. techno-industrial preeminence” at that time).

<sup>2</sup> See Gaia Bernstein, *In the Shadow of Innovation*, 31 *CARDOZO L. REV.* 2257, 2258 (2010) (writing on the role of innovation in intellectual property laws and the celebration of innovation in case law).

<sup>3</sup> Daniel Ben-Horin, *Innovation Obsession Disorder*, *STAN. SOC. INNOVATION REV.* (Apr. 11, 2012), [http://www.ssireview.org/blog/entry/innovation\\_obsession\\_disorder](http://www.ssireview.org/blog/entry/innovation_obsession_disorder) (“We humans have always innovated. It’s what we do. It got us out of the caves.”).

<sup>4</sup> Thomas L. Friedman, Opinion, *How to Monetize Your Closet*, *N.Y. TIMES*, Dec. 22, 2013, at SR11.

<sup>5</sup> See *The Rise of the Sharing Economy*, *ECONOMIST*, Mar. 9, 2013, <http://www.economist.com/news/leaders/21573104-internet-everything-hire-rise-sharing-economy> (“What’s mine is yours, for a fee.”); see also RACHEL BOTSMAN & ROO ROGERS, *WHAT’S MINE IS YOURS: THE RISE OF COLLABORATIVE CONSUMPTION* xv (2010).

<sup>6</sup> See Juho Hamari, Mimmi Sjöklint & Antti Ukkonen, *The Sharing Economy: Why People Participate in Collaborative Consumption*, *J. ASS’N FOR INFO. SCI. & TECH.* (forthcoming 2015) (manuscript at 2), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2271971](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2271971); Georgios Zervas, Davide Proserpio & John W. Byers, *The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry* 2, 8, 20 (*Bos. U. Sch. of Mgmt., Research Paper No. 2013-16*, 2015), <http://papers.ssrn.com/sol3/>

part of the legal and economic literature has argued that a stronger self-regulatory system could replace traditional regulation.<sup>7</sup> In the age of the sharing economy, the regulatory responsibility should be reallocated to parties and not to the government.<sup>8</sup> At the other end of the scale is a more restrictive position defended by courts around the world and a number of industries affected by the sharing economy, which declares its skepticism toward these practices, contending that existing legal categories and frameworks should be applied to the sharing economy.<sup>9</sup> That is, innovation claims and peer-to-peer transactions do not exempt entrepreneurs from regulatory burdens, namely compliance with public health and safety measures. In this Article, I argue that this debate has been highly polarized, neglecting that the heart of the matter is not whether the state should be in or out of the innovation game, but rather *when* and *how* it should be involved.

As I have argued in previous work,<sup>10</sup> when traditional regulation (designed for a professional–consumer relationship at a time when there were no navigation systems, Internet platforms, or transparent reputational mechanisms) is applied to innovative collaborative practices, regulators risk stifling innovative practices that challenge this model.<sup>11</sup> In this Article, I contend that, considering the uncertainty that characterizes this sector, regulators should take a step back, analyze how the innovation

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[papers.cfm?abstract\\_id=2366898](#) (analyzing the role of reputational mechanisms and the impact of Airbnb on hotel occupation rates).

<sup>7</sup> Christopher Koopman, Matthew Mitchell & Adam Thierer, *The Sharing Economy and Consumer Protection Regulation: The Case for Policy Change* 17 (Mercatus Ctr. at Geo. Mason Univ., Working Paper 2014), <http://mercatus.org/publication/sharing-economy-and-consumer-protection-regulation-case-policy-change>.

<sup>8</sup> Molly Cohen & Arun Sundararajan, *Self-Regulation and Innovation in the Peer-to-Peer Sharing Economy*, 82 U. CHI. L. REV. DIALOGUE 116, 116 (2015).

<sup>9</sup> Some sharing economy platforms and their users have been sanctioned in a number of countries for refusing to comply with home-sharing (e.g., rental permits) and ride-sharing (e.g., taxi licenses) requirements. In 2014 and 2015, peer-to-peer Uber services known as UberX or UberPOP in Europe lost a number of judicial challenges in Europe. See, e.g., Landgericht [LG][Länder Court] Mar. 18, 2015, 3-08 O 136/14, [http://www.lareda.hessenrecht.hessen.de/lexsoft/default/hessenrecht\\_lareda.html#docid:7405026](http://www.lareda.hessenrecht.hessen.de/lexsoft/default/hessenrecht_lareda.html#docid:7405026) (Ger.); CBB, 8 december 2014, ECLI:NL:CBB:2014:450 (Uber Int'l B.V./Minister van Infrastructuur en Milieu) (Neth.) (qualifying Uber as an illegal taxi company and stating that Uber should comply with the same rules applicable to other transportation services). In France, Uber has also faced similar challenges and its arguments were recently rejected by the French Constitutional Court. See Conseil constitutionnel [CC][Constitutional Court] decision No. 2015-484 QPC, Sept. 22, 2015, (Fr.).

<sup>10</sup> See Sofia Ranchordás, *Does Sharing Mean Caring? Regulating Innovation in the Sharing Economy*, 16 MINN. J.L. SCI. & TECH. 413, 471 (2015).

<sup>11</sup> Chris Dellarocas, *The Digitization of Word-of-Mouth: Promise and Challenges of Online Reputation Systems*, 49 MGMT. SCI. 1407 (2003) (discussing the opportunities and challenges of online reputation mechanisms and how they differ from the traditional word-of-mouth).

process works, what information they have at that time, and reflect upon the *timing* of their regulatory action. Drawing inspiration from the evolving nature of the sharing economy, this Article suggests two timing approaches. First, in some cases, regulators should enact temporary and experimental regulations to offer a prompt but adaptable regulatory response to innovative products and services. As this Article explains, a number of regulators throughout the United States have enacted temporary regulatory frameworks to regulate sharing-economy platforms such as Uber and Lyft. Second, in other cases, I argue that regulators should delay the regulatory intervention to a later stage, allowing rules on sharing-economy platforms to “sunrise” if they prove to be necessary, once more information on the opportunities and risks of the sector becomes available.

Experimental regulations are temporary dispositions that are enacted to try new legal solutions on a small-scale basis.<sup>12</sup> These dispositions are retrospectively evaluated at the end of a certain period. Experimental rules are a first step to more informed, often better, and more evidence-based regulation. Experimental regulations can be attractive to both regulators and innovators because they give innovation a chance, without putting consumers at risk.<sup>13</sup> During the experimental period, regulators can gather more information on the effectiveness of these temporary rules, observe how technology is evolving, and update regulations taking into account potential novelties, side-effects of these regulations, or input from consumers and firms. This experimental approach converts regulation into an iterative learning path, where uncertainty and change are regarded as opportunities to improve regulation by trying new rules and observing what works and what does not.<sup>14</sup> The uncertainty of the innovation process is thus not an excuse to regulate in the dark<sup>15</sup> or delay prompt regulatory action while waiting for further information.

Sunrise clauses are the second instrument that can assist regulators in the mission of keeping up with innovation. While experimental regulations and other forms of temporary legislation, such as sunset clauses, avoid regulation that lags behind innovation, sunrise clauses avoid regu-

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<sup>12</sup> For a thorough analysis of the concept of “experimental legislation” and the distinction between this and other forms of temporary legislation, see my previous work, SOFIA RANCHORDÁS, *CONSTITUTIONAL SUNSETS AND EXPERIMENTAL LEGISLATION: A COMPARATIVE PERSPECTIVE* (2014).

<sup>13</sup> *New State Ice Co. v. Liebmann*, 285 U.S. 262, 300 (1931) (Brandeis, J., dissenting).

<sup>14</sup> See Rob van Gestel & Gijs van Dijck, *Better Regulation Through Experimental Legislation*, 17 EUR. PUB. L. 539, 539 (2011) (discussing experimental legislation as a means to improve the quality of regulation and fulfill the requirements of the so-called “Better Regulation”).

<sup>15</sup> For more on regulating without sufficient information, see Roberta Romano, *Regulating in the Dark*, in *REGULATORY BREAKDOWN: THE CRISIS OF CONFIDENCE IN U.S. REGULATION* 86, 96 (Cary Glogianese ed., 2012).

lation that is precocious in relation to the state of technology and its commercialization.<sup>16</sup> A sunrise clause is a disposition that provides that a part of a statute or regulation only comes into force after a specific date in the future and its coming into effect is contingent upon the verification of specific conditions.<sup>17</sup> Sunrise clauses are thus a form of contingent legislation or regulation because the coming into effect of a certain provision depends on the fulfillment of a certain condition (e.g., generalized compliance with certain safety regulations).

This Article makes a theoretical claim on the timing of regulatory interventions, which could be applied beyond the realm of sharing-economy practices. Sharing-economy practices are used to illustrate this Article's argument because of the innovative and disruptive character of this sector, the limited amount of legal research in this area, the polarized debate between regulators, different interest groups (e.g., taxi drivers) defending the maintenance of existing legislation and digital platforms criticizing its obsolete and innovation-stifling character. In addition, while sharing-economy platforms are being accused of circumventing regulations and are seeking new and negotiated alternatives with public authorities (for example, by establishing partnerships with cities or negotiating rulemaking), federal regulators (such as the Federal Trade Commission) seem to be still observing the evolution of the sector.<sup>18</sup>

This Article proceeds as follows. In Part I, I define "innovation" and explain the characteristics of its process. For the purposes of this Article, innovation is defined as the concretization of new ideas and their translation into welfare-enhancing commercial or social outcomes by using new processes, products, or services. In this Article, I analyze the complexities of the innovation process and its relevance for regulation, beyond the traditional intellectual-property-law debate on this topic. I argue that innovation is a complex and evolving process that requires state intervention but which also can be easily stifled if regulations are not permeable

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<sup>16</sup> See my previous work on the use of sunset clauses in the context of innovation policy and regulation Sofia Ranchordás, *Innovation-friendly Regulation: The Sunset of Regulation, the Sunrise of Innovation*, 55 *JURIMETRICS* 201 (2015).

<sup>17</sup> See MARK FREEMAN, *NECESSARY EVILS: AMNESTIES AND THE SEARCH FOR JUSTICE* 142 (2009).

<sup>18</sup> For more on home-sharing, see *Airbnb, Tel Aviv to Create Interactive City Guide*, *TIMES ISR.* (Sept. 11, 2015), <http://www.timesofisrael.com/airbnb-tel-aviv-to-create-interactive-city-guide-2/>. Airbnb is currently establishing partnerships not only with multiple large companies including KLM, T-Mobile or American Express but also with cities such as Tel Aviv. For more on ride-sharing, see *Germany: Uber Wins Lithuania, Loses Germany*, *COMPETITION POL'Y INT'L* (Nov. 2, 2015), <https://www.competitionpolicyinternational.com/germany-uber-wins-lithuania-loses-germany>. Uber recently signed a memorandum of agreement with the city of Vilnius after negotiating the terms on which the platform would be allowed to operate in the Lithuanian capital.

to change. A better understanding of the innovation process is essential to determine the impact of legal instruments on the innovation process.

In Part II, I analyze the interaction between the state and innovation beyond the traditional debate on the relationship between intellectual-property rights and innovation policy. I start Part II by demystifying the myth of innovation as a private activity, or, in the specific case of the sharing economy, as mere digital platforms that facilitate personal and collaborative transactions between two peers or the sharing of under-used goods.<sup>19</sup> Part II outlines the different rationales and market failures that justify active state intervention in the innovation process.

Part III is dedicated to the analysis of two different solutions for the regulatory challenges of innovation, notably in the field of the sharing economy. First, I analyze the development of an experimentalist approach that can help minimize the natural tendency that law has to lag behind innovation by allowing regulators to experiment with the tentative regulation of innovative platforms on a small-scale basis. I explain that this approach is far from being recent in common-law countries but its implementation has remained restricted to the state level. Second, I discuss the enactment of sunrise clauses in technological areas which might require regulatory intervention at a later stage once they reach a certain degree of maturity or a number of conditions are fulfilled. Although sunrise clauses and contingent legislation are far from being recent instruments in common law, they have remained under-explored in the literature.<sup>20</sup>

## I. UNDERSTANDING INNOVATION

Since the most remote times, innovation has been part of human societies—or, at least, most human societies<sup>21</sup>: we learned to run, to swim, and even to fly. We do all of this increasingly faster and better because we take advantage of opportunities to learn and improve. Innovation starts with a problem; the bigger the problem, the greater our excitement to

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<sup>19</sup> For the distinction between digital platforms that consist of “asset hubs” and platforms that connect service providers and consumers and their regulation, see Daniel E. Rauch & David Schleicher, *Like Uber, but for Local Government Policy: The Future of Local Regulation of the “Sharing Economy”* (Geo. Mason L. & Econ. Res. Paper, No 15-01, 2015), <http://ssrn.com/abstract=2549919>.

<sup>20</sup> One of the first and most well-known cases involving contingent legislation is *Cargo of the Brig Aurora v. United States*, 11 U.S. 382 (1813).

<sup>21</sup> Dave Francis & John Bessant, *Targeting Innovation and Implications for Capability Development*, 25 *TECHNOVATION* 171, 171 (2005) (“Since the Paleolithic period some, but not all, human societies formed enterprises that created new or improved artefacts, devised ‘better’ processes, developed new ways of selling and devised alternative models of organising.”). On why some peoples and nations innovate more, conquer more, or are more successful than others, see generally JARED DIAMOND, *GUNS, GERMS, AND STEEL: THE FATES OF HUMAN SOCIETIES* (1999).

solve it.<sup>22</sup> However, contrary to conventional wisdom, innovation is not only the gift of a handful of geniuses.<sup>23</sup> Instead, the mindset and logic of innovation seem to be inherent in human nature<sup>24</sup> and a result of decades of state intervention. The state is not only the actor that provides the financial means to promote innovation but also the one that protects citizens against the risks of uncontrolled innovation. This Part seeks to explain how these innovation mindsets and logic function, and why this is relevant for legislators and regulators.

### A. *Definition*

Innovation is the key element of competitiveness and economic growth at both micro and macro levels<sup>25</sup>: firms that do not innovate are driven out of the market, and the same is true for nations that remain poor because their economies fail to innovate and grow.<sup>26</sup> Innovation is a broad and complex concept that can refer to new social initiatives (e.g., community kindergartens for single parents), a number of novel sharing-economy platforms that offer an array of convenient services (e.g., Get-Around, Spare5),<sup>27</sup> or novel technologies (e.g., driverless cars). Innovation seems to promise everything—in particular, more jobs, international competitiveness, and economic growth—and it sometimes costs as little

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<sup>22</sup> See HOLDEN THORP & BUCK GOLDSTEIN, *ENGINES OF INNOVATION: THE ENTREPRENEURIAL UNIVERSITY IN THE TWENTY-FIRST CENTURY 2* (2010) (“What is most exciting about innovation is that it begins with a problem; the bigger the problem, the more significant the innovation needed.”).

<sup>23</sup> See Peter F. Drucker, *The Discipline of Innovation*, HARV. BUS. REV., Aug. 2002, at 95–96 (describing the different sources of innovation).

<sup>24</sup> See DAVID PENSACK & ELIZABETH LICORISH, *INNOVATION FOR UNDERDOGS: HOW TO MAKE THE LEAP FROM WHAT IF TO NOW WHAT 11* (Jodi Brandon ed., 2008); Jan Fagerberg, *Innovation: A Guide to the Literature*, in *THE OXFORD HANDBOOK OF INNOVATION 1* (Jan Fagerberg, David C. Mowery & Richard R. Nelson eds., 2005).

<sup>25</sup> See WILLIAM J. BAUMOL, *THE FREE-MARKET INNOVATION MACHINE: ANALYZING THE GROWTH MIRACLE OF CAPITALISM 4* (2002); HENRY W. CHESBROUGH, *OPEN INNOVATION: THE NEW IMPERATIVE FOR CREATING AND PROFITING FROM TECHNOLOGY xvii* (2003).

<sup>26</sup> See ROBERT D. COOTER & HANS-BERND SCHÄFER, *SOLOMON’S KNOT: HOW LAW CAN END THE POVERTY OF NATIONS 5* (2011) (analyzing the role of law in solving the double trust dilemma between innovators and investors, which represents a serious problem to innovation in developing countries).

<sup>27</sup> Spare5 is a smartphone application that allows users to be paid by using their spare time to perform small tasks (e.g., filling in surveys). See SPARE5, <http://www.spare5.com/>. GetAround is another sharing economy platform, which functions as a peer-to-peer car-rental service. That is, instead of renting a car from a car rental company, a peer can rent an automobile from a car owner living in his neighborhood. See Matt McFarland, *GetAround, the App that Lets You Rent a Stranger’s Car, Launches in Washington*, WASH. POST (May 18, 2015), <http://www.washingtonpost.com/blogs/innovations/wp/2015/05/18/getaround-the-app-that-lets-you-rent-a-strangers-car-launches-in-washington-d-c/>.



as nothing: Innovation can result from serendipitous moments of our lives,<sup>28</sup> the development of simple digital smartphone applications to facilitate the sharing of leftovers (e.g., “Leftoverswap” or “FoodSharing”), or low-budget improvements of existing technology.<sup>29</sup> More recently, it has been argued that the development of technological platforms not only promotes the sharing of under-used goods (e.g., cars with Sidecar and BlablaCar, or even tools with 1000Tools) but also entrepreneurship among individuals who otherwise would not have a platform on which to share their creativity (e.g., Etsy).<sup>30</sup>

Innovation is a broad and comprehensive concept that can refer to the newest breakthrough innovations in biotechnology—such as the use of engineered tobacco plants as biofuel—or the newest sharing-economy platforms.<sup>31</sup> In the context of this Article, I define innovation as the ability to apply new ideas and transform them into commercial or social outcomes that enhance consumer welfare by using new processes, products, or services.<sup>32</sup> We can identify different elements in this definition: novel

<sup>28</sup> For more on serendipity, see generally ROBERT K. MERTON & ELINOR G. BARBER, *TRAVELS AND ADVENTURES OF SERENDIPITY: A STUDY IN SOCIOLOGICAL SEMANTICS AND THE SOCIOLOGY OF SCIENCE* (2011); for more specifically on patent law and serendipity, see Sean B. Seymore, *Serendipity*, 88 N.C. L. REV. 185, 190–91, 198–99 (2009) (arguing against the implementation of conventional legal doctrines to serendipitous discoveries).

<sup>29</sup> The concept of “frugal innovation” refers to creative improvisation with fewer resources or innovations—often with a social mission—that result from a response to the limitations in institutional, financial, or material resources (e.g., the Tata Nano car is an affordable family car commercialized in India that allows more Indian families to have access to an automobile). See generally NAVI RADJOU & JAIDEEP PRABHU, *FRUGAL INNOVATION: HOW TO DO MORE WITH LESS* (2014) (explaining the principles and techniques of frugal innovation); see also KIRSTEN BOUND & IAN THORNTON, NESTA, *OUR FRUGAL FUTURE: LESSONS FROM INDIA’S INNOVATION SYSTEM* 6–11 (2012), [http://www.nesta.org.uk/sites/default/files/our\\_frugal\\_future.pdf](http://www.nesta.org.uk/sites/default/files/our_frugal_future.pdf). For the development of digital platforms that allow for the sharing of food leftovers, see Elisabeth Braw, *Free Lunch, Anyone? Foodsharing Sites and Apps Stop Leftovers Going to Waste*, GUARDIAN, May 5, 2014 <http://www.theguardian.com/sustainable-business/free-food-sharing-leftovers-surplus-local-popular>.

<sup>30</sup> See Michael Farren, *No Permission Slips Needed*, U.S. NEWS & WORLD REP. (June 22, 2015), <http://www.usnews.com/opinion/economic-intelligence/2015/06/22/sharing-economy-innovators-shouldnt-be-shackled-by-rules-for-a-bygone-era>.

<sup>31</sup> For more on the concept of social innovation, see Clayton M. Christensen, Heiner Baumann, Rudy Ruggles & Thomas M. Sadtler, *Disruptive Innovation for Social Change*, HARV. BUS. REV., Dec. 2006, at 96; James A. Phillips, Jr., Kriss Deiglmeier & Dale T. Miller, *Rediscovering Social Innovation*, STAN. SOC. INNOVATION REV., Fall 2008, at 34, 36–37. For an overview of examples on social innovation in the E.U. context, see EUR. COMM’N, *THIS IS EUROPEAN SOCIAL INNOVATION* 8 (2010).

<sup>32</sup> See Richard Bendis & Ethan Byler, *Creating a National Innovation Framework: Building a Public-Private Support System to Encourage Innovation*, SCI. PROGRESS (April 22, 2009), <http://scienceprogress.org/2009/04/creating-a-national-innovation-framework/>; Richard R. Nelson & Sidney G. Winter, *In Search of Useful Theory of Innovation*, 6 RES. POL’Y 36, 37 (1977).

idea; new social or technological outcomes; concretization; and consumer-welfare promotion (or a change for the better).

First, innovation is more than a novel idea. Besides a more or less brilliant idea, we must be able to identify methods for successful implementation of the idea in the marketplace or in society.<sup>33</sup> This idea might be the result of a serendipitous moment of inspiration or, in most cases, years of research. Although “happy accidents” have resulted in numerous innovations, the truth is that innovation, in general, is not based on luck. Rather, innovation is a routine activity, “based on long-term strategies and targeted investments.”<sup>34</sup>

Second, the underlying concept of innovation can refer to technological, business, and social innovations. This latter form of innovation refers to the development of new ideas that are primordially directed at the solution of social needs, such as the reduction of poverty and the empowerment or integration of certain minorities.<sup>35</sup>

Third, in this Article I view innovation as “a change for the better.” In other words, innovative products and processes should be regulated and enabled if they enhance consumer welfare. Without wishing to engage directly with the literature on innovation, antitrust/intellectual-property debate and consumer welfare,<sup>36</sup> it is important to mention that firms can compete not only on price but also on innovation. They can “make new markets” by creating a demand for new and better products (e.g., the iPad) which can improve the lives of some consumers.<sup>37</sup> Innovation is to a great extent the product of technology. Technology is not neutral from a value point of view, but rather informed by numerous values varying from design and economic criteria to welfare and social considerations.<sup>38</sup> Therefore, the concept of innovation can exclude “bad in-

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<sup>33</sup> Fagerberg, *supra* note 24, at 4.

<sup>34</sup> MARIANA MAZZUCATO, *THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC VS. PRIVATE SECTOR MYTHS* 59 (2013) (“[T]he search for one product [often] leads to the discovery of a completely different one, in a process characterized by serendipity. This of course does not mean that innovation is based on luck, far from it. It is based on long-term strategies and targeted investments.”).

<sup>35</sup> See Press Release No. IP/09/81, Eur. Comm'n, President Barroso Discusses How to Boost “Social Innovation” (Jan. 20, 2009) (“Social innovation means the design and implementation of creative ways of meeting social needs.”).

<sup>36</sup> See *generally* GUSTAVO GHIDINI, *INNOVATION, COMPETITION AND CONSUMER WELFARE IN INTELLECTUAL PROPERTY LAW 1* (2010).

<sup>37</sup> See GREG DOLIN, *CTR. FOR THE PROT. OF INTELLECTUAL PROP., RESOLVING THE PATENT-ANTITRUST PARADOX: PROMOTING CONSUMER WELFARE THROUGH INNOVATION 1–3* (2013), <http://cpip.gmu.edu/wp-content/uploads/2013/08/Dolin-Patent-Antitrust-Paradox.pdf>.

<sup>38</sup> NOEL COX, *TECHNOLOGY AND LEGAL SYSTEMS* 63 (2006) (“Technology is informed by values at every point. Value decisions may be called for not only in relation to the specific design criteria (such as aesthetic, ergonomic and economic judgments, suitability for purpose and ease of manufacture) but also in relation to the rightness or wrongness of a particular solution in ethical terms.”).

novation” or, in other words, new ideas that would not enhance consumer welfare.<sup>39</sup>

The concept of innovation could be further categorized and distinguished from quasi-innovations. To be sure, there are different forms of innovation (e.g., product/process innovations, disruptive/incremental innovations), and there are also similar concepts related to the idea of “newness” that are not included in the mentioned concept of innovation. A first important distinction is between the terms innovation and invention. Invention is “the creation of something completely new to the world. Innovations [in the case of incremental improvements] are seen as new product developments based on existing products.”<sup>40</sup> In addition, in the case of innovation, the emphasis is not only placed on the newness of the creative activity—or the internal aspect of innovation—but also on its external manifestation, which is the diffusion or adoption or, in other words, the commercialization of a new product. Hence, innovations are not necessarily the “first occurrence of an idea for a new product or process,” but rather “the first attempt to carry it out into practice.”<sup>41</sup> This first clarification brings us to our second distinction between disruptive and incremental innovation.

Disruptive innovation breaks with existing knowledge and paradigms, delivering something substantially new. Incremental innovation, on the contrary, builds upon existing knowledge, producing small improvements of existing products and processes.<sup>42</sup> Recent and widely discussed examples of disruptive innovation are driverless vehicles and the 3-D printer. The latter uses existing technology but in a significantly transformative way, printing much more than ink on paper.<sup>43</sup> Incremental innovation refers rather to small improvements (e.g., minor ergonomic improvements in the design of car seats, new features in a sharing platform that allow you not only to order a car, but also to easily share the ride with other people traveling to the same destination). Even within these two categories, different types of disruptive innovation (business

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<sup>39</sup> This is, however, a simplification of the relationship between innovation and consumer demand and welfare. This relationship is much more complex in reality because, as economic literature examined in recent years, there are different types of consumers, such as the economic consumer, the routine consumer, the Galbraith consumer, the Douglas consumer, the Marshall consumer, and the Veblen consumer. All these types will have different attitudes toward innovation. See G.M. PETER SWANN, *THE ECONOMICS OF INNOVATION: AN INTRODUCTION* 25, 187 (2009).

<sup>40</sup> See Christiaan Redelinghuys, *Counting the Seeds of Innovation: A Holistic Approach to Auditing Innovation*, in *MEASURING INNOVATION IN OECD AND NON-OECD COUNTRIES* 59, 62 (William Blankley et al. eds., 2006).

<sup>41</sup> Fagerberg, *supra* note 24, at 4.

<sup>42</sup> See CLAYTON M. CHRISTENSEN, *THE INNOVATOR’S DILEMMA* xviii (2011).

<sup>43</sup> See, e.g., Paul Nunes & Larry Downes, *The Five Most Disruptive Innovations at CES 2014*, *FORBES* (Jan. 10, 2014), <http://www.forbes.com/sites/bigbangdisruption/2014/01/10/the-five-most-disruptive-innovations-atces2014/>.

versus technological innovation) may have different characteristics and competitive effects.<sup>44</sup> However, for purposes of the legal treatment of innovation, I employ a broad concept of disruptive innovation, because the most important aspect of this type of innovation is the fact that it significantly changes the status quo and it arrives unaccompanied by information as to its potential risks and *modus operandi*.

The mere definition of innovation does not shed much light on the challenges encountered by regulators, particularly in the case of the sharing economy. As I have discussed in a previous work,<sup>45</sup> the practice of sharing under-used goods is far from being novel in itself; instead the underlying idea dates back to centuries ago. However, it is indisputable that sharing-economy platforms such as “Share Some Sugar” and “Bright Neighbor” could be characterized as innovations even if the object of the transaction in itself is not a high-tech product.<sup>46</sup> While sharing some sugar among neighbors might be left outside the legal realm and fit within the non-regulated personal sphere, the question of whether the same reasoning is applicable to a number of transactions taking place on sharing platforms is more disputed. This Article does not perform an in-depth analysis of the regulation of sharing-economy practices or their multiple issues, such as privacy, employment, and public-safety concerns. Rather, this Article analyzes a small fraction of this topic, assuming that regulation is needed but *at the right time*, when sufficient information becomes available. The emphasis on the timing element is inspired by how the innovation process takes place. In order to understand this premise, the following Section examines the characteristics of the innovation process as an uncertain and iterative path.

### B. *Characteristics of Innovation*

This Section analyzes a number of features of the innovation process that might have an impact on the selected form of state intervention, namely through experimental rulemaking and sunrise clauses. One of the explanations for the skepticism against state intervention in the innovation process lies in the fact that regulators might not always have the information and means to approach the uncertainty of innovation and regulate it correctly. Instead, the literature has argued that regulators may instead stifle it with obsolete regulations, excessively interventionist

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<sup>44</sup> Constantinos Markides, *Disruptive Innovation: In Need of a Better Theory*, 23 J. PROD. INNOVATION MGMT. 19, 19–22 (2006) (criticizing Clayton Christensen’s attempt to apply his theory of disruptive innovation to different fields without taking into account the different competitive effects and markets generated by disruptive technological innovation and disruptive business innovation).

<sup>45</sup> Ranchordás, *supra* note 10, at 429.

<sup>46</sup> See Keara Schwartz, *Keara Schwartz, Founder of Share Some Sugar*, COLLABORATIVE CONSUMPTION (Sept. 1, 2010), [http://www.collaborativeconsumption.com/2010/09/01/keara\\_schwartz\\_founder\\_of\\_share\\_some\\_sugar/](http://www.collaborativeconsumption.com/2010/09/01/keara_schwartz_founder_of_share_some_sugar/).

rules, and opinion-based rules because they do not possess much information about a new product and do not know how to react when a certain technology is constantly changing.<sup>47</sup> This often occurs due to a mismatch between the general goals of law (e.g., stability, predictability) and the loose and permanently evolving nature of innovation.

Innovation is a *volatile* and moving target. In other words, innovations are incremental or disruptive *future* phenomena that are subject to constant change.<sup>48</sup> This volatility is partially responsible for the second characteristic: the innovation process is highly *uncertain*. This means that innovation is a source of risks, dangers, and opportunities that law, with its obsession with stability and predictability, might fear to embrace. Furthermore, as I explain in the next Subsections, innovation is a complex phenomenon that results from the collaboration of a number of actors.

### 1. *Uncertainty*

The concept of innovation is often associated with indeterminate realities: the unknown or yet to be discovered. Not surprisingly, this newness comes hand-in-hand with a great deal of uncertainty. The difficulty in regulating innovation can thus be primarily explained by the uncertainty that characterizes the innovation process, affecting the decisions of both innovators and regulators.

Uncertainty is present throughout the entire innovation process and can manifest itself in multiple ambiguities and a lack of information, such as technological uncertainty, social and political uncertainty, managerial uncertainty, and regulatory delays or uncertainty.<sup>49</sup> This generalized uncertainty can be translated into multiple questions, such as<sup>50</sup>: What types of innovations are necessary to solve a certain social, economic or technological problem? Will this specific improvement solve it? How much will it cost and will we be able to find investors for the capital we need? Do these innovations offer any risk for society? How and when will these innovations be regulated? These questions arise because innovation is inevitably influenced by both inherent and external uncertainties. The inherent uncertainties are connected with the process of innovation and the unpredictability of its outcomes (e.g., whether or not a sharing platform will be successful and able to connect peers borrowing and lending

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<sup>47</sup> On the difference between “opinion-based” and “evidence-based” or “fact-based” regulation, see Jeffrey J. Rachlinski, *Evidence-Based Law*, 96 CORNELL L. REV. 901, 902 (2011); Ann Seidman & Robert B. Seidman, *ILTAM: Drafting Evidence-Based Legislation for Democratic Social Change*, 89 B.U. L. REV. 435, 451 (2009).

<sup>48</sup> See Lyria Bennett Moses, *How to Think About Law, Regulation and Technology: Problems with “Technology” as a Regulatory Target*, 5 LAW, INNOVATION & TECH. 1 (2013).

<sup>49</sup> See Harri Jalonen, *The Uncertainty of Innovation: A Systematic Review of the Literature*, J. MGMT. RES., Jan. 2012, E12, at 2, <http://dx.doi.org/10.5296/jmr.v4i1.1039>.

<sup>50</sup> Nelson & Winter, *supra* note 32, at 47–48 (analyzing the main characteristics of the innovation process, including uncertainty, diversity, and institutional complexity).

tools or offering and hailing rides), whereas external uncertainties refer to the regulatory framework or the necessary conditions to enable the introduction of innovative products or services in the market.

Innovators face various uncertainties at the different stages of the innovation process (e.g., risks of not recovering investment or risk of delay of the commercialization of their new products, risk of political instability or uncertainty,<sup>51</sup> regulatory delays<sup>52</sup>). Firms engaged in the process of innovation face significant uncertainty challenges and risks regarding the exact costs and benefits of the innovation about which they sometimes know little about.<sup>53</sup> The literature distinguishes in this context between conventional business risk and the “innovator’s risk.”<sup>54</sup> The former is connected with the possibility that a new product will not be granted a license or the risk of bankruptcy, should the commercialization of the product not be successful.

The innovator’s risk is both inherent to the novelty itself and in the lack of information as to its potential dangers, e.g., the risk that Airbnb houses will be rented by well-intentioned tourists as originally intended, but also will be used as an illegal rental agency by professionals.<sup>55</sup> The development of an innovation implies thus not only the usual business risks, but also specific risks associated with the lack of information inherent to the development of new products and services. The search for new information required by the innovation process is often a synonym for significant transaction costs for both regulators and innovators.<sup>56</sup> Not incurring these costs could result in the commercialization of products without being able to predict their potential effects and side-effects. In addition, this informational uncertainty can have a direct impact on a second level: the regulation of innovative products and services. The absence of information as to the risks or effects of an innovative product can increase the chances that the respective regulatory framework shall delay or impede the diffusion of innovative products.

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<sup>51</sup> On the impact of political uncertainty on business investment, see George Bittlingmayer, *Regulatory Uncertainty and Investment Evidence from Antitrust Enforcement*, 20 CATO J. 295, 295–96 (2001).

<sup>52</sup> An example of regulatory delay is the delay in grant approval of new medicine by the FDA. See James E. Prieger, *Product Innovation, Signaling, and Endogenous Regulatory Delay*, 34 J. REG. ECON. 1, 1 (2008).

<sup>53</sup> Nicholas A. Ashford & Robert F. Stone, *Liability, Innovation, and Safety in the Chemical Industry*, in *THE LIABILITY MAZE: THE IMPACT OF LIABILITY LAW ON SAFETY AND INNOVATION* 374 (Peter W. Huber & Robert E. Litan eds., 1991).

<sup>54</sup> James T. O’Reilly, *Entrepreneurs and Regulators: Internet Technology, Agency Estoppel, and the Balance of Trust*, 10 CORNELL J.L. & PUB. POL’Y 63, 69 (2000).

<sup>55</sup> William Alden, *The Business Tycoons of Airbnb*, N.Y. TIMES, Nov. 30, 2014, at MM16. On how innovators manage technical risks, see generally LEWIS M. BRANSCOMB & PHILIP E. AUERSWALD, *TAKING TECHNICAL RISKS: HOW INNOVATORS, EXECUTIVES, AND INVESTORS MANAGE HIGH-TECH RISKS* 3–5 (2001).

<sup>56</sup> Ashford & Stone, *supra* note 53, at 374.

Uncertainty impacts innovation in multiple ways. The above-described uncertainties inherent to the innovation process are a source of concern among public-interest groups and regulators. However, regulatory decisions and delays<sup>57</sup> are another potential problem for the development of long-term investment plans.<sup>58</sup> Regulatory uncertainty can affect the incentives of a firm to innovate, namely when the time span to develop profitable technology appears to be a crucial factor.<sup>59</sup> If firms do not know when, if, and under what conditions their products or services will be authorized, the incentive to invest may decrease.<sup>60</sup> Regulatory delays are costly in most sectors and, whenever the product introduction benefits decrease progressively, an additional day of regulatory delay can be extremely costly.<sup>61</sup>

Having discussed uncertainty from the side of innovators, it is now time to turn to the regulators. Under informational uncertainty, regulators face the challenge of having to predict what the future will be like, and draft rules accordingly. At the resemblance of what the Kuhnian “normal science” does, regulation can only pretend to know what the world is like unless it is willing to break with existing paradigms and embrace the uncertain.<sup>62</sup> This uncertainty is aggravated in the sectors characterized by disruptive innovations, where existing paradigms are replaced by new ones, leaving regulators with few facts on which to base their regulations. Therefore, the regulatory challenge of innovation is that of regulating the lack of information, and taking into account multiple prognostics regarding the potential risks and opportunities of the innovative products and processes.

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<sup>57</sup> Regulatory delay refers to the period of time between the moment a firm requests the approval of a new product or the regulation of a new service and its administrative approval or enactment of the respective regulation.

<sup>58</sup> Gregory N. Mandel, *Regulating Emerging Technologies*, 1 LAW, INNOVATION & TECH. 75, 76 (2009).

<sup>59</sup> Ronald R. Braeutigam, *The Effect of Uncertainty in the Regulatory Delay on the Rate of Innovation*, LAW & CONTEMP. PROBS. Winter–Spring 1979, at 98, 99.

<sup>60</sup> Richard B. Stewart, *Regulation, Innovation, and Administrative Law: A Conceptual Framework*, 69 CALIF. L. REV. 1256, 1284 (1981).

<sup>61</sup> See James E. Prieger, *Regulatory Delay and the Timing of Product Innovation*, 25 INT’L J. INDUS. ORG. 219, 220 (2007) (analyzing how regulatory delays produce a negative impact on the development of innovative products). More recent economic research has however demonstrated that regulatory delays do not affect entrepreneurs to the same extent. Instead, while small entrepreneurs might face the risk of being driven out of the market while waiting for a permit or a license to operate, large companies already expect and are financially prepared to wait for the regulatory intervention. See Wim Marneffe, *Time Is Money: The Cost of Waiting for the Government*, 3 THEORY & PRAC. LEGIS. 213 (2015).

<sup>62</sup> See THOMAS S. KUHN, THE STRUCTURE OF SCIENTIFIC REVOLUTIONS 2–3 (3d ed. 1996) (challenging the idea of scientific knowledge as “development-by-accumulation” and referring to the development of science by breaking with existing paradigms).

Inherent uncertainty as to the risks deriving from emerging technologies like biotechnology or nanotechnology can lead regulators either to delay the regulatory framework, or to constantly—and possibly incoherently—review this framework.<sup>63</sup> Industry inaction might occur when regulators operate on the grounds of delays, “agency threats,” and rigid regulation.<sup>64</sup> A negative and stringent approach to uncertainty does not take into account the fact that innovators themselves are also at pains with the same problem. It punishes innovators, without solving the problem of balancing risks with opportunities.

In sum, uncertainty is an inherent element of the innovation process. However, regulators usually respond to the inherent uncertainty of innovation with more uncertainty, applying obsolete legal categories to new products, imposing excessive regulatory burdens, and engaging into contradictory reviews of the regulatory framework.

## 2. *Diversity and Institutional Complexity*

Besides the element of uncertainty in the innovation process, regulators should also be aware of two other features of innovation: diversity and institutional complexity.<sup>65</sup> Both characteristics refer to the idea that innovation is the result of the collaboration between different actors.

Diversity is both an intrinsic and extrinsic element of innovation. It refers both to the diversity of the actors involved in the innovation process and to the diversity in our society. On the one hand, diversity in the innovation process (e.g., within research and development (R&D) departments) potentiates innovation due to the existence of distinct ideas and perspectives. In other words, teamwork between people with different educational and cultural backgrounds increases the probability of developing new ideas: “In problem solving, diversity is powerful stuff.”<sup>66</sup> This explains why diversity is often regarded as an asset and ensures that work forces are as diverse as possible (different cultural backgrounds, education, formation, and professional experience).

Thinking out of the box may be more difficult if all the members of a society are trained to think the same way and their diversity is neither respected nor valued. Although this idea appears to be self-evident, diver-

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<sup>63</sup> Stewart, *supra* note 60, at 1267.

<sup>64</sup> In favor of agency threats, see Tim Wu, *Agency Threats*, 60 DUKE L.J. 1841, 1848 (2011) (arguing that “[r]ule by threats . . . is, under uncertain circumstances, a superior means of regulatory oversight”). Criticizing this position, see Jerry Brito, “*Agency Threats and the Rule of Law: An Offer You Can’t Refuse*,” 37 HARV. J.L. & PUB. POL’Y 553, 554 (2014), and Nathan Cortez, *Regulating Disruptive Innovation*, 29 BERKELEY TECH. L.J. 175, 179 (2014).

<sup>65</sup> In this Article I follow the traditional deconstruction of the innovation process in multiple features, such as uncertainty, diversity, and institutional complexity. See Nelson & Winter, *supra* note 32, at 47–48.

<sup>66</sup> SCOTT E. PAGE, *THE DIFFERENCE: HOW THE POWER OF DIVERSITY CREATES BETTER GROUPS, FIRMS, SCHOOLS, AND SOCIETIES* xix–xx (2007).



sity has not always been protected by law and policy, and has instead often been seen as a threat. This was, according to James Scott, one of the many reasons for the stagnation of the former Soviet Union at a certain point in time, and the ultimate failure of the modernist and centrally planned schemes implemented there.<sup>67</sup> In the Western world, there are also examples of former tendencies towards uniformity and standardization that had a negative impact on the innovation process. This was the case of the New Deal policies. This program, which laid down the basis for 20th-century regulation, was mainly based on the premises of modernism, notably legal certainty, order, rationality, objectivity, universality, and suppression of diversity.<sup>68</sup> Although these values were important at a time of crisis, nowadays a strict interpretation of these ideas would not fit the constant mutability of society and technology and the desire to foster innovation. Not surprisingly, the New Deal seems to have been replaced by the “Renew Deal” paradigm based on governance policies, praise for diversity, adaptability, flexibility, and experimentalism.<sup>69</sup> This change in paradigm reveals namely a greater awareness for the value of diversity. However, as I explain in Part III, there is still a long way to go before our regulatory state can concretize the “Renew Deal” and match it with the “Innovation Deal.”

Diversity is both an intrinsic element of the innovation process and an important external aspect of its concretization. In other words, innovation requires diversity at the level of the inventors and the regulators (or any actors that aim at enabling it). In this context, institutional diversity is visible at different levels: first, when defining the national and regional innovation-policy priorities; and second, when implementing innovative products, firms might want to adapt them to different social, economic, and cultural features. In order to “go global,” firms and governments responsible for the definition of innovation goals have to “think local.” For firms, this means adapting their products (no matter how innovative they are) to local specificities. Take the case of multinational food companies that offer standard products for most geographic regions but vary their flavors according to the local preferences of consumers and seasons. For public actors in charge of drafting and implementing innovation policies, this implies considering and balancing national with local interests.

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<sup>67</sup> See JAMES C. SCOTT, *SEEING LIKE STATE: HOW CERTAIN SCHEMES TO IMPROVE THE HUMAN CONDITION HAVE FAILED* 203 (1998) (discussing how the disregard for diversity explains the failure of a number of modernist projects).

<sup>68</sup> For a thorough analysis of the New Deal regulation and an overview of new regulatory approaches to regulation and governance, see Orly Lobel, *The Renew Deal: The Fall of Regulation and the Rise of Governance in Contemporary Legal Thought*, 89 MINN. L. REV. 342 (2004).

<sup>69</sup> See *id.* at 346, 348.

Innovation results not only from the research done by scientists, but also from the policies and projects developed by interdisciplinary teams at companies, sometimes in cooperation with federal agencies, and state or local government actors. Institutional complexity is thus inherent to the process of innovation. The diversity of actors and the consequent institutional complexity is required because, unlike companies, the public regional innovators may be more eager to pursue social goals and internalize the risk of high-risk projects.<sup>70</sup> Innovative solutions to societal challenges may increase general welfare, but do not always generate private profit.<sup>71</sup> This does not signify that companies should not be involved in the solution of social problems or that they should not be made aware of their social responsibility. In fact, a number of business innovations may both generate profit and, as a side-effect, reduce environmental impacts and improve people's living conditions.<sup>72</sup>

Innovation policy was traditionally defined at the national level and driven by national priorities and interests.<sup>73</sup> In the last few decades, there has been a shift at this level by placing more emphasis on the role of state and local governments, and incentivizing the development of federal laboratories. It has been suggested in the literature that it is not possible to define the one-and-only "best practice" innovation policy approach for every region.<sup>74</sup> Since this Article is focused on the advancement of innovation at the national level, no further elaboration on this topic will be provided. However, it is important to emphasize that since diversity is a driving factor of innovation, this element should be present both at the internal and regulatory levels. This means that in practice a multitude of public and private actors should be involved in advancing innovation. This introduces the second Part of this Article, where I discuss the reasons why the state should not be left out of the innovation picture.

## II. INNOVATION AND THE STATE

The term "state intervention" refers in this Article to the broad role of government in the determination of the form and direction of laws and policies.<sup>75</sup> The governmental actions relevant for this analysis vary

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<sup>70</sup> See WEISS, *supra* note 1, at 3–4 (analyzing the different forms of state intervention in national-security innovation).

<sup>71</sup> See ORG. FOR ECON. COOP. & DEV., *MEASURING INNOVATION: A NEW PERSPECTIVE* 15–16 (2010).

<sup>72</sup> See *id.* at 15.

<sup>73</sup> See Jeremy Howells, *Innovation and Regional Economic Development: A Matter of Perspective?*, 34 RES. POL'Y 1220, 1223 (2005).

<sup>74</sup> Franz Tödting & Michaela Trippel, *One Size Fits All? Towards a Differentiated Regional Innovation Policy Approach*, 34 RES. POL'Y 1203, 1204 (2005).

<sup>75</sup> See COX, *supra* note 38, at 33 ("Government is both a product of society, history and environment, but is also instrumental in determining the form and direction of

from regulations adopted by federal agencies to state and local initiatives. Innovation is both a public and private activity that benefits highly from the collaboration between the state and private actors. The advancement of innovation is not the state's main activity, but without state intervention, a number of innovations would not have been possible.<sup>76</sup> State intervention has always been the main pillar of invaluable innovations, either by providing direct financial support to significant research projects (e.g., the Internet, the Google algorithm, the Concorde, and the multiple innovations at NASA)<sup>77</sup> or by providing a legal framework for the protection of intellectual property, ensuring the enforcement of contracts between inventors and innovators, collaborating with private parties to develop modern infrastructures for the country through public-private partnerships, and regulating fair competition in the market that may lead to higher levels of innovation.<sup>78</sup> In this Article, I focus on state intervention through law and regulation and the state's role in the advancement of innovation. As Joseph Stiglitz notes, "markets don't exist in a vacuum, and each of the laws and regulations that structure our economy shape the economy. Therefore, unwittingly, government is always engaged in industrial policy" and, one could add, in the innovation process.<sup>79</sup>

Regulation is the first and main form of state intervention in the innovation process analyzed in Part II. There is an undeniable connection between the evolution of society and its law. Since "[l]aw is necessarily only a means and cannot be an end in itself[,]” law tends to respond to (rather than determine) societal and technological change.<sup>80</sup> As I discuss in Part III, the use of legal foresight mechanisms such as sunrise clauses can empower law to steer innovation in a certain direction in terms of compliance. The relationship between law and innovation—or, more specifically, between law and technology—is usually described as being twofold: law regulates technology both by prohibiting or imposing limita-

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laws. . . . Law both constrains and encourages developments both of technology and of other social and economic change, but is itself also a product of its environment.”).

<sup>76</sup> See generally MAZZUCATO, *supra* note 34 (debunking the myth of innovation as a private activity and arguing that while “innovation is not the State's main role,” the state should play an important entrepreneurial role in society).

<sup>77</sup> See ALFRED D. CHANDLER, JR., *THE VISIBLE HAND: THE MANAGERIAL REVOLUTION IN AMERICAN BUSINESS* 1–10, 174–75, 496–97 (1999) (providing a historical perspective on the role of the state and the reasons for the dominance and efficient innovation policy of “big business” in a number of economic sectors).

<sup>78</sup> See Paul Mason, *From Concorde to iPhone: State Intervention Drives Technological Innovation*, *GUARDIAN* (July 27, 2014), <http://www.theguardian.com/commentisfree/2014/jul/27/concorde-iphone-history-state-intervention-technological-innovation>.

<sup>79</sup> See JOSEPH E. STIGLITZ & BRUCE C. GREENWALD, *CREATING A LEARNING SOCIETY: A NEW APPROACH TO GROWTH, DEVELOPMENT, AND SOCIAL PROGRESS* 371 (2014).

<sup>80</sup> See Alan Watson, *Society's Choice and Legal Change*, 9 *HOFSTRA L. REV.* 1473, 1473–74 (1981) (analyzing the complex connection between a society and the legal rules and institutions that operate within it and the forces that control legal change).

tions on certain forms of potentially harmful technologies and practices (e.g., regulation of permits to practice a certain profession), and also by providing incentives to other forms of technology that might improve.<sup>81</sup>

A. *Innovation Without the State: The Myth*

Innovation has been mythically conceived as an inherent eagerness to learn and challenge the current state-of-the-art. This perception is often presented as the result of effortless sagacity and unplanned or accidental factors.<sup>82</sup> According to this widespread perception, innovation is here a “basement” or “garage activity” that is mainly motivated by internal factors (“a little voice driving innovation”).<sup>83</sup> When we watch *The Social Network* or read about the success story of Facebook, we are led to believe that breakthrough innovation can always be quickly and successfully introduced in the market, facing only minor legal challenges from other private parties.<sup>84</sup> In such an “innovation world without a State,” innovation is associated with the result of the work of lonely geniuses that drop out of college to start later successful companies like Apple, Microsoft, or Facebook.<sup>85</sup> As the opening quote of this Article suggests, innovators appear to rule the world without any state intervention.<sup>86</sup>

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<sup>81</sup> See COX, *supra* note 38, at 31 (analyzing how law influences technology by prohibition and regulation in some cases, and by encouragement and protection in others).

<sup>82</sup> See generally MERTON & BARBER, *supra* note 28.

<sup>83</sup> See SCOTT BERKUN, *THE MYTHS OF INNOVATION* 37–43 (Mary Treseler & Rachel Monaghan eds., paperback ed. 2010) (analyzing different myths related to the development of innovation).

<sup>84</sup> The facts are well-known: Tyler Winklevoss, Cameron Winklevoss, and Divya Narendra claimed that Mark Zuckerberg “stole” his idea regarding the creation of a social networking website for college students. *Facebook, Inc. v. Pac. Nw. Software, Inc.*, 640 F.3d 1034, 1036 (9th Cir. 2011). The case was finally resolved in 2011. Judge Kozinski stated that “[t]he Winklevosses are not the first parties bested by a competitor who then seek to gain through litigation what they were unable to achieve in the marketplace. And the courts might have obliged, had the Winklevosses not settled their dispute and signed a release of all claims against Facebook.” *Id.* at 1042.

<sup>85</sup> See David S. Abrams & R. Polk Wagner, *Poisoning the Next Apple? The America Invents Act and Individual Inventors*, 65 *STAN. L. REV.* 517, 517–20 (2013) (affirming that the perception of the lonely inventor is part of the “American innovation history,” analyzing in particular how the Leahy–Smith America Invents Act might change this). On the concept of “innovator,” see Eric J. Gouvin, *Of Small Businesses and Entrepreneurs: Toward a Public Policy that Supports a New Venture*, in *ENTREPRENEURSHIP AND INNOVATION IN EVOLVING ECONOMIES* 27, 37–38 (Megan M. Carpenter ed., 2012) (analyzing the most common motivations of the average “entrepreneur,”—who, unlike Bill Gates and Steve Jobs, is not a young college dropout but is a man in his forties, married, who attended college, and who aims to have some economic stability; the “real-life innovator” is highly sensitive to state incentives and the risk of having limited access to health care). Also contradicting the “myth of the lonely inventor,” see, for example, CHIP HEATH & DAN HEATH, *THE MYTH OF THE*

However, more recent regulatory prohibitions and litigation in the cases of Uber and Airbnb show that some innovative initiatives that defy existing paradigms and regulations might face numerous hurdles. For example, in New York, multiple Airbnb hosts have been heavily fined for operating “illegal hotels”; in Europe, the application of existing taxi regulations to Uber has resulted in the prohibition of its activities and multiple injunctions in different countries.<sup>87</sup> Therefore, it is not surprising that we often read in the media that regulation and innovation “don’t mix,”<sup>88</sup> and that we might have to choose between a Welfare State and an Innovation State.<sup>89</sup> This Article rejects this polarized discussion.

The “gig economy” or “sharing economy” has not only democratized information and access to more goods, services, and finance (with crowdfunding and peer-to-peer loans), but it has also lowered the threshold for becoming an entrepreneur and innovator: individuals can now develop small businesses using mere sharing platforms like Etsy, getting started without the assistance of the state or wealthy venture capitalists.<sup>90</sup> In addition, the literature has argued that these innovative small businesses (gigs) tend to benefit below-median-income consumers who would otherwise not be able to own some of the required tools or goods to start their businesses.<sup>91</sup> In this context, the intervention of the state is sometimes portrayed in a part of the media as superfluous or even detrimental

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GARAGE 5–6 (2011) (ebook) (demystifying the myth of lonely garage inventors as the stereotypical inventors).

<sup>86</sup> See WEISS, *supra* note 1, at 1.

<sup>87</sup> See Ranchordás, *supra* note 10, at 470; see, e.g., *Room for All, for Now*, ECONOMIST (Apr. 26, 2014) <http://www.economist.com/news/business/21601259-there-are-signs-sharing-site-starting-threaten-budget-hotels-room-all>; see also Jeevan Vasagar, *Uber Taxi Service Suffers Setback in Berlin*, FIN. TIMES (Apr. 17, 2014), <http://www.ft.com/intl/cms/s/0/1591faf2-c638-11e3-ba0e-00144feabdc0.html#axzz387TxWRMa>. The Berlin Taxi Association won an injunction against Uber; however, the plaintiff chose not to enforce the ruling.

<sup>88</sup> See Larry Downes, *Lessons from Uber: Why Innovation and Regulation Don’t Mix*, FORBES (Feb. 6, 2013), <http://www.forbes.com/sites/larrydownes/2013/02/06/lessons-from-uber-why-innovation-and-regulation-dont-mix/>. Although some economic studies have proven regulation has a negative impact on innovation, the evidence of this negative impact on economic growth and innovation is mixed. See MARTIN NEIL BAILY & ALOK K. CHAKRABARTI, INNOVATION AND THE PRODUCTIVITY CRISIS 29 (1988) (“[T]he slow growth of aggregate demand and the deep recessions of 1975 and 1982 were undertaken to fight inflation.”).

<sup>89</sup> See Gary Shapiro, *Innovation, Not Regulation, Will Increase Global Prosperity*, FORBES (Feb. 20, 2014), <http://www.forbes.com/sites/realspin/2014/02/20/innovation-not-regulation-will-increase-global-prosperity/>.

<sup>90</sup> *Id.* (“Innovation no longer requires wealthy venture capitalists to fund groundbreaking ideas. The rise of crowdfunding through websites like Kickstarter and Indiegogo is quickly democratizing investment, giving thousands of innovators the boost they need to create new products and services.”).

<sup>91</sup> See RADJOU & PRABHU, *supra* note 29, at 11.

to the innovation process.<sup>92</sup> The perception of innovation as a primarily private activity is a healthy belief or myth, especially of libertarian politicians.<sup>93</sup> It gives the innovator the leading role in the “innovation film,”<sup>94</sup> it battles against the idea of “big government,” and usually means that the state should only intervene at the macroeconomic level to solve alleged market failures.<sup>95</sup> What does the government have to do with innovation anyway, which is, at the end of the day, something that has not been created yet? How can the state regulate invisible and intangible realities like the future of the Internet?<sup>96</sup> The mythical perception of innovation as an intrinsically private activity is also supported by the idea that creativity is a form of freedom that does not react well to the pressure to conform to rules. Rather, innovation and creativity imply “breaking rules and disobeying norms.”<sup>97</sup>

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<sup>92</sup> See, e.g., Edward Morrissey, *Overregulation Is Killing America's Can-Do Spirit*, FISCAL TIMES (May 8, 2014), <http://www.thefiscaltimes.com/Columns/2014/05/08/Overregulation-Killing-America-s-Can-Do-Spirit> (“However, over the last thirty-five years, the ratio slowly dwindled, and eventually reversed itself. . . . [B]usiness dynamism and entrepreneurship are experiencing a troubling secular decline. . . . The problem, therefore, is national, and must relate to regulatory or tax policy or a combination of both.”); John Stossel, *How Central Planners Kill Innovation*, REASON.COM (Feb. 11, 2015), <http://reason.com/archives/2015/02/11/spontaneous-order-for-the-win> (“[I]nnovation tends to occur in the freest sectors of the economy, while sectors most closely affiliated with government stagnate.”).

<sup>93</sup> See MAZZUCATO, *supra* note 34, at 15. Disagreeing with this “‘common sense’ truth,” Mazzucato explains that “[a]cross the globe we are hearing that the State has to be cut back in order to foster a post-crisis recovery . . . unleash[ing] the power of entrepreneurship and innovation in the private sector. The media, business and libertarian politicians draw from this convenient contrast, and feed into the dichotomy of a dynamic, innovative . . . private sector versus a sluggish . . . public sector.” *Id.*

<sup>94</sup> It is interesting to contrast the libertarian perspective to the diametrically opposed Soviet innovation policy where the innovator was only regarded as the provider of labor, but could still qualify for a reward (or “certificate of authorship”). In this system, every type of state support was highly regulated and incremental innovations were much less valued than disruptive ones. See George M. Armstrong, Jr., *Legal Restraints on Innovation in the USSR*, 9 REV. SOCIALIST L. 243, 245 (1983) (“Innovation which enhances the appeal of the product to consumers or the reliability or durability of the article brings no income to the producer under the present, inflexible Soviet system of pricing.”).

<sup>95</sup> See generally MAZZUCATO, *supra* note 34, ch. 2–3 (analyzing national innovation policies in the U.S. and in the U.K.).

<sup>96</sup> Cf. LAWRENCE LESSIG, CODE: VERSION 2.0 at 38 (2006) (describing the libertarian approach to state intervention and regulation: “The invisible man doesn’t fear the State. He knows his nature puts him beyond its reach . . . . If you can’t know who someone is, or where he is, or what he’s doing, you can’t regulate him. His behavior is as he wants it to be. There’s little the state can do to change it.”).

<sup>97</sup> See SWANN, *supra* note 39, at 125 (“Creativity of its very character involves breaking rules and disobeying norms.”).

According to the perception of innovation as a private activity, governments will be at most responsible for the development of generic policies, such as providing tax incentives, tax breaks, or other financial stimuli (e.g., research grants, prizes) which may or may not produce a positive impact on innovation.<sup>98</sup> However, the state is not conceived here as the entrepreneur that pushes and pulls innovation or provides a regulatory framework that enables innovation. Rather, the attitude of innovators is adverse to regulation. Who needs the state and its regulations anyway in the age of crowdfunding, democratization of information, finance, and everything else you might be able to trade, imitate, or share?

State intervention has traditionally been criticized because regulation was often associated with unfair competition, burdensome bureaucracy, and the imposition of costly burdens for firms.<sup>99</sup> There is in fact little consensus as to the legislative and regulatory instruments to be used to facilitate and stimulate innovation, and whether regulation can have an enabling role at all.<sup>100</sup> This occurs because law is often unable to keep up, holding on to old traditions that do not make much sense in an evolving world.<sup>101</sup>

### B. Regulation Stifling Innovation

In this Section, I provide an overview of the perspective that regulation tends to stifle innovation. This can occur because innovators and regulators traditionally abide by different rules and principles: innovators are nourished by the desire of change, even at the expense of risks; while

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<sup>98</sup> Wilfred Dolfsma & DongBack Seo, *Government Policy and Technological Innovation—A Suggested Typology*, 33 *TECHNOVATION* 173, 174 (2013) (“The inconclusive or mixed findings about the effects of government policies to stimulate innovation and technological development, in combination with a liberal inclination to have markets take on a larger responsibility and for governments not to favor some market players over others, seem to have led to . . . [a] broad set of policies aimed at appropriately changing the national system of innovation so that technological innovation may be stimulated.”).

<sup>99</sup> See Peerasit Patanakul & Jeffrey K. Pinto, *Examining the Roles of Government Policy on Innovation*, 25 *J. HIGH TECH. MGMT. RES.* 97, 98 (2014) (providing an overview of the literature on how different government policies and regulations can promote or hinder innovation: “While government policies and regulations can promote significant fundamental changes in product and process technology, which can also benefit the industrial innovators if not carefully managed, they can actually have significantly deleterious effects on innovation. . . . Policies and regulations can contribute to, among other results, unfair competition, . . . too much state control, and bureaucracy. . . . They can have a negative effect on productivity and competitiveness of the firms because of the increased operating cost burden.”).

<sup>100</sup> Konstantinos K. Stylianou, *An Innovation-Centric Approach of Telecommunications Infrastructure Regulation*, 16 *VA. J.L. & TECH.* 221, 222 (2011).

<sup>101</sup> For an analysis of the pacing problem and the institutions that might be able to close the gap, see Lyria Bennett Moses, *Agents of Change: How the Law ‘Copes’ with Technological Change*, 20 *GRIFFITH L. REV.* 763 (2011).

regulators require stability and predictability, even at the expense of the delay of innovation. What is more, regulation can become an obstacle to innovation because “entrepreneurs and government regulators see the world quite differently”—the first see flexibility and risk as parts of the business, while regulators are often risk-averse, preferring stability and predictable long-term outcomes.<sup>102</sup> Legislative or regulatory instruments are commonly regarded as obstacles to innovation: the bureaucratic impositions of law are quickly accused of stifling creativity and commercial success. In other words, regulation has been traditionally thought of as an obstacle to innovation and creativity: “Law is about routine, regulation, defined boundaries, [and a] standardized process,” whereas innovation emerges from freedom.<sup>103</sup>

With the advent of the information society innovation is moving faster than ever, becoming increasingly incompatible with the current, slow bureaucratic systems. These rules and procedures are unable to keep up with the “explosion of innovative solutions” that has been made possible by the Internet.<sup>104</sup> Entrepreneurs become thus burdened with an excessive number of compliance requirements or are received with ostensive regulatory prohibitions.<sup>105</sup> This last case often happens when new technology defies the status quo of regulation. We do not even need to think about very complex and modern devices. The bicycle was one of the first victims. Because bicycles differed from existing transportation technologies in the 19th century (e.g., trains or horse carriages), extant regulations focused on preventing the defective use of this technology resulted in general bans of bicycles from both sidewalks and roads for the sake of public safety.<sup>106</sup> As bicycles started to be used more widely, these prohibitions could not hold anymore. Such an approach to the regulation of

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<sup>102</sup> O’Reilly, *supra* note 54, at 64.

<sup>103</sup> CREATIVITY, LAW AND ENTREPRENEURSHIP 3 (Shubha Ghosh & Robin Paul Malloy eds., 2011).

<sup>104</sup> See PRAVEEN GUPTA, BUSINESS INNOVATION IN THE 21ST CENTURY 22–23 (2007) (referring specifically to intellectual property rights: “With the advent of the Internet, information is becoming available quickly. . . . [T]he rate new information is being added on the Internet is itself exploding exponentially. . . . Current slow bureaucratic systems will not be able to keep up with the explosion of innovative solutions and related intellectual property.”).

<sup>105</sup> This problem is not exclusive of high-tech firms; instead, regulatory pressure (or the excessive number of regulatory burdens) affects multiple sectors that are far from being new. See, e.g., John Braithwaite & Valerie Braithwaite, *The Politics of Legalism: Rules Versus Standards in Nursing-Home Regulation*, 4 SOC. & LEGAL STUD. 307 (1995).

<sup>106</sup> See SUSAN W. BRENNER, LAW IN AN ERA OF “SMART” TECHNOLOGY 37–38 (2007) (analyzing the relationship between legal tools and the evolution of technology). Brenner notes that in the 19th century, lawmakers were focused on preventing defective implementation of technology, so “[l]egislators at first simply banned bicycles from major thoroughfares, including sidewalks . . . based on public safety considerations.” *Id.*



then-new technology was obsolete, as the Minnesota Supreme Court explained in 1894:

[A] bicycle is a vehicle used now very extensively for convenience, recreation, pleasure, and business, and the riding of one upon the public highway in the ordinary manner . . . is neither unlawful nor prohibited, and they cannot be banished because they were not . . . used in the Garden of Eden by Adam and Eve.<sup>107</sup>

Newer means of transportation have encountered similar regulatory hurdles, since existing regulation did not quite fit the new technologies. This was the case of the Segway in some European countries, where lawmakers insisted in qualifying this device according to the existing categories (automobile, bicycle, or motorcycle) in order to be able to establish the respective insurance regulations. In the case of the Netherlands, legislators, regulators, insurance companies, and Segway debated the regulation of this vehicle for almost six years before this “pedestrian electric scooter” was authorized.<sup>108</sup> The lack of consensus and the insistence on using good old rules instead of enacting new ones meant, for example, that the introduction of the Segway in the Dutch market was delayed for a number of years. The same problem seems to threaten the regulation of new forms of transportation, like driverless automobiles or other forms of “smart technology,” where humans are not simply using (or misusing) technology, but are also asked to interact with it (e.g., robots).<sup>109</sup>

More recently, the obsolescence of regulations and the need to apply existing legal categories to new phenomena that fit in none of them has also been raised in the regulation of sharing-economy platforms.<sup>110</sup> This has been particularly visible in the regulation of transportation, for example, at the level of the licenses and the qualification of Uber drivers as employees.<sup>111</sup> Some regulators, like the California Public Utilities Commission, have been adopting a progressive and more innovation-friendly attitude towards Uber and Lyft by enacting specific regulation for these

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<sup>107</sup> See *id.* at 37; see also *Thompson v. Dodge*, 60 N.W. 545, 546 (Minn. 1894).

<sup>108</sup> See Jeroen Van Bergeijk, *Segway Stumbles in Europe*, WIRED (Dec. 18, 2003), <http://archive.wired.com/science/discoveries/news/2003/12/61632>.

<sup>109</sup> See BRENNER, *supra* note 106, at 137, 139 (2007) (“[T]he concept of ‘misusing’ a technology becomes meaningless when our relationship with technology shifts from ‘use’ to ‘interaction.’ . . . The ‘interactive’ conception of our relationship with technology differs from the traditional conception of ‘use’ in two essential ways: One is that we do not make a conscious decision to utilize technology; technology is part of our environment, and we ‘interact’ with it just as we ‘interact’ with our environment.”).

<sup>110</sup> See generally Koopman et al., *supra* note 7.

<sup>111</sup> Eric Posner, *Why Uber Will—and Should—Be Regulated*, SLATE (Jan. 5, 2015), [http://www.slate.com/articles/news\\_and\\_politics/view\\_from\\_chicago/2015/01/uber\\_surge\\_pricing\\_federal\\_regulation\\_over\\_taxis\\_and\\_car\\_ride\\_services.html](http://www.slate.com/articles/news_and_politics/view_from_chicago/2015/01/uber_surge_pricing_federal_regulation_over_taxis_and_car_ride_services.html).

new forms of transportation.<sup>112</sup> However, the criticism that Uber or Lyft drivers do not have a medallion or a meter, as the one acquired by taxi-drivers, might be an obsolete and even an inadequate argument.<sup>113</sup> These regulations will necessarily hinder the innovative character of these sharing-economy practices because they would discourage the drivers from seeing Uber as a part-time gig, would raise the price of rides, and would destroy the peer-to-peer service idea of converting peers into professionals. In addition, the limited number of licenses would hamper a substantial benefit from Uber and Lyft: increasing the supply of cars and providing lower prices and more choice to consumers. Another element of great controversy in the sharing economy has been the classification of Uber and Lyft drivers as employees or independent contractors. This year the California Labor Commission ruled that an Uber driver was an employee.<sup>114</sup> In March 2015, two U.S. District Court judges in San Francisco underlined the disconnection between extant labor concepts and the challenges posed by sharing-economy platforms, and ruled that juries would have to determine the status of company drivers:

The test the California courts have developed over the 20th Century for classifying workers isn't very helpful in addressing this 21st Century problem. . . . California's *outmoded* test for classifying workers will apply in cases like this. And because the test provides nothing remotely close to a clear answer, it will often be for juries to decide.<sup>115</sup>

In both cases, the wrong legal issues are being raised. Existing legal categories do not fit the peer-to-peer economy, the use of sharing-economy platforms, and the new problems they raise. Instead, sharing-economy platforms require their own set of rules because more often than not they raise similar problems regarding consumer and service-provider protection, privacy concerns, tax collection, violation of zoning regulations, safeguard of road safety, and public health.<sup>116</sup>

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<sup>112</sup> See Press Release, Cal. Pub. Util. Comm'n, CPUC Establishes Rules For Transportation Network Companies (Sept. 19, 2013), <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M077/K132/77132276.PDF>.

<sup>113</sup> Dante Ramos, Editorial, *Uber, Lyft Force Soul-Searching About Regulation*, BOS. GLOBE (May 3, 2015), <https://www.bostonglobe.com/opinion/editorials/2015/05/02/uber-lyft-force-soul-searching-mass-about-local-regulation/mVWZK18EDieXpgKDyaPEpN/story.html>.

<sup>114</sup> Maya Kosoff, *The California Labor Commission Just Ruled that an Uber Driver Is an Employee—Here's Why It Could Dramatically Change Uber's Business Model*, BUS. INSIDER, (June 17, 2015), <http://www.businessinsider.com/uber-and-lyft-employee-lawsuits-could-change-business-models-2015-6>.

<sup>115</sup> *Cotter v. Lyft, Inc.*, 60 F. Supp. 3d 1067, 1081–82 (N.D. Cal. 2015) (emphasis added); see also *O'Connor v. Uber Tech., Inc.*, 82 F. Supp. 3d 1133 (N.D. Ca. 2015).

<sup>116</sup> See K. Sabeel Rahman, *Curbing the New Corporate Power*, BOS. REV. (May 4, 2015), <http://bostonreview.net/forum/k-sabeel-rahman-curbing-new-corporate-power>

Besides this tendency to remain attached to the stability and predictability of law, state intervention in the innovation process has also been rejected on other grounds. The preference for more reduced state intervention is also explained by the fact that public lawmakers would have “weak incentives to produce socially valuable legal innovations . . . because they share little of the public benefits of producing laws . . . [and] have weak and misaligned incentives to innovate.”<sup>117</sup> In addition, there might also be a conflict between the public interest and the interest of private parties. Interest groups may also play a decisive role at this level, steering policy and legislative decisions in the direction of certain solutions that might not necessarily be those that promote the public interest.<sup>118</sup> This reminds us of the debate on privatization of infrastructure-based industries (e.g., telecommunications or the energy sector) that was supposed to foster short-term efficiency and innovation in a way that the public sector would never be able to do.<sup>119</sup>

There is some truth to the myth of innovation as a private activity. It is true, for example, that with the acceleration of the pace of technological change and the shift in the state–market balance of power, the state retreated partially because it had little to say as to the innovation process.<sup>120</sup> It is also true that state intervention in the innovation process, namely through law and regulation, is still not aligned with the innovation process, often lagging behind technology while providing inadequate instruments, limiting instead of fostering innovation. This mismatch between state intervention and innovation is partially due to the uncertainty of innovation: a future (or at least existing but moving) target.<sup>121</sup> In addition, government intervention has not always been correctly targeted, producing at times costly results.<sup>122</sup>

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(arguing that Amazon and sharing-economy platforms should be regulated as monopolies).

<sup>117</sup> See Bruce H. Kobayashi & Larry E. Ribstein, *Law as Product and Byproduct*, 9 J.L. ECON. & POL’Y 521, 522–23 (2013) (arguing that because public lawmakers do have the right incentives to produce socially valuable legal innovations, private lawmaking could be a better option to fill these regulatory gaps).

<sup>118</sup> Mary Wiktorowicz & Raisa Deber, *Regulating Biotechnology: A Rational-Political Model of Development*, 40 HEALTH POL’Y 115, 118 (1997).

<sup>119</sup> See generally John P.M. Groenewegen & Rolf W. Künneke, *Process and Outcomes of the Infrastructure Reform: An Evolutionary Perspective*, in INSTITUTIONAL REFORM, REGULATION AND PRIVATIZATION: PROCESS AND OUTCOMES IN INFRASTRUCTURE INDUSTRIES 2 (Rolf W. Künneke et al. eds., 2005) (analyzing the rise and fall of liberalization of infrastructure services).

<sup>120</sup> See SUSAN STRANGE, *THE RETREAT OF THE STATE: THE DIFFUSION OF POWER IN THE WORLD ECONOMY* 7 (1996) (noting that the “technological factor” and, more specifically, its fast pace is often highly overlooked in the analysis of the shift in the functions of the state).

<sup>121</sup> See Stewart, *supra* note 60, at 1272 (“[R]egulatory requirements may look like uncertain, shifting targets that can chill innovation incentives among regulated firms.”); see also Moses, *supra* note 48, at 1 (“As quickly as new inventions and new

The myth of innovation explained above translates the perception of innovation as an *obstacle* to innovation in virtue of the excessive and obsolete burdens placed on industries. The advancement of innovation through regulation has also been criticized and qualified as a “true antithesis” because, as mentioned earlier, the fast-changing and fluid nature of innovation does not go well with rigid top-down rules.<sup>123</sup> This is nevertheless a general claim that does not take into account specific forms and benefits of regulation.

More recently, the legal literature has started to see a different and broader role for law and regulation in the innovation process. Instead of being perceived as a mere obstacle to innovation, law is thought to be susceptible of enabling innovation. This has been argued, for example, by Robert Cooter and Hans-Bernard Schäfer who contend that law can lay down an enabling path for innovation, closing the gaps between creation and capital and “law as the past or tradition” and “law of the future” (innovation).<sup>124</sup> In this sense, law has started to be perceived by some as a potential facilitator of innovation.

The awareness that the government should intervene in the regulation and promotion of innovation is nonetheless insufficient: First, many of the laws originally designed to promote innovation have proven to produce the opposite result;<sup>125</sup> second, incorrectly targeted innovation may produce costly results.<sup>126</sup>

### C. *The State as the Innovator*

While a world of innovation without patents,<sup>127</sup> occupational licenses, taxes on sharing-economy practices,<sup>128</sup> and the dictatorship of the state

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industries are developed, lawyers ... have rushed to examine their legal implications. ... [T]here is a strong sense among legal scholars [and] practitioners ... that there is something important to say about the intersection between law or regulation on the one side and technology on the other.”)

<sup>122</sup> Bert Frischmann, *Innovation and Institutions: Rethinking the Economics of U.S. Science and Technology Policy*, 24 VT. L. REV. 347, 351–52 (2000).

<sup>123</sup> RANCHORDÁS, *supra* note 12, at 23.

<sup>124</sup> This is the general argument of “Solomon’s Knot.” See COOTER & SCHÄFER, *supra* note 26, at ix.

<sup>125</sup> See Michael A. Carrier, *Increasing Innovation Through Copyright Common Sense and Better Government Policy*, 62 EMORY L.J. 983, 988, 997 (2012) (criticizing vague copyright law and suggesting the elimination of statutory damages and personal liability in cases of secondary infringement).

<sup>126</sup> See generally Frischmann, *supra* note 122.

<sup>127</sup> On the impact of patent law on innovation, see the historical evidence analyzed by Petra Moser, *Innovation Without Patents: Evidence from World’s Fairs*, 55 J.L. & ECON. 43, 69–70 (2012) (analyzing the period between 1851 and 1915, and indicating that the large majority of innovations were not patented). Moser explains that “[i]f, however, a large share of innovations occurred outside the patent system, patent laws may have a weaker than expected effect on the rate of technical

might be the dream of some, it is just that: a dream or even a fairy tale, just like the one at the outset of the word “serendipity.”<sup>129</sup> When and before our sharing activities go wrong, we will need the state. Although sharing-economy practices can have a number of benefits, self-regulation or no regulation will not suffice to combat the negative externalities produced by these activities. To illustrate, the lack of rules has not been praised by the neighbors of Airbnb hosts for whom the unknown guests might be a nuisance.<sup>130</sup>

In addition, state intervention is required when private parties would not have a strong incentive to innovate (e.g., “orphan drugs” used to treat rare diseases which require significant investment but which are not lucrative). In many other non-obviously profitable innovation-related situations, the helping hand of the state will be there to provide grants, subsidies, and prizes. In fact, the state has almost always been there. Innovation is in many cases not a one-time and lonely activity but rather a routine activity resulting from large investments in R&D.<sup>131</sup>

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change. . . . With patent laws, the center of innovative activity may shift to an entirely new set of industries, even as it fails to increase overall levels of innovation.” *Id.* Also using historical empirical evidence to test the assumption that patent law stimulates innovation, see Lea Shaver, *Illuminating Innovation: From Patent Racing to Patent War*, 69 WASH. & LEE L. REV. 1891 (2012) (arguing that “patent protection clearly provides short-term benefits to innovation, but it also produces unanticipated long-term costs to competition and next-generation innovation,” concluding that, more empirical research would be required on the “innovation assumption . . .”).

<sup>128</sup> See generally Shu-Yi Oei & Diane M. Ring, *Can Sharing Be Taxed?*, 93 WASH. U. L. REV. (forthcoming 2016), [http://www.law.nyu.edu/sites/default/files/upload\\_documents/Shu-Yi%20Oei.pdf](http://www.law.nyu.edu/sites/default/files/upload_documents/Shu-Yi%20Oei.pdf).

<sup>129</sup> See Deborah Mills Scotfield, *Serendipitous Innovation*, FORBES (Aug. 23, 2011), <http://www.forbes.com/sites/work-in-progress/2011/08/23/serendipitous-innovation/>. The word “serendipity” is based on a Persian fairy tale from the 14th century entitled *The Three Princes of Serendip* “whose heroes were always making discoveries, by accidents and sagacity, of things they were not in quest of.” *Id.* Serendip is the former designation of Sri Lanka. (quoting Letter from Horace Walpole to Horace Mann (Jan. 28, 1754)).

<sup>130</sup> Dean Baker, *Don't Buy the 'Sharing Economy' Hype: Airbnb and Uber are Facilitating Rip-Offs*, GUARDIAN (May 27, 2014), <http://www.theguardian.com/commentisfree/2014/may/27/airbnb-uber-taxes-regulation> (“Airbnb can also raise issues of safety for its customers and nuisance for hosts’ neighbors.”).

<sup>131</sup> See BAUMOL, *supra* note 25, at 1–9 (characterizing innovation as a long process that results from routine investments in R&D). Baumol also discusses the value of individual entrepreneurs and innovators, arguing that the role of entrepreneurs is “only part of the story. Alongside their own activity . . . a new, systematized, bureaucratized, and highly efficient set of parallel activities is being carried out within the innovative oligopolistic corporations.” *Id.* at ix. Baumol claims that “free-market pressures . . . force firms into a continuous process of innovation, because it becomes a matter of life and death for many of them.” *Id.* at viii.

Many life-changing innovations would not have been conceivable without state intervention. Such a list would include, for example, the Internet, the Google algorithm, NASA innovations, or even the Concorde (even if this last innovation did not have a happy ending).<sup>132</sup> In recent decades, public institutions and public funding have played an increasingly important role in the innovation process.<sup>133</sup> This has been visible for example in the new forms of collaboration between public and private parties in multiple sectors and the development of public procurement of innovation.<sup>134</sup>

Law is not necessarily the enemy or an invisible character in the innovation process. Different fields and instruments of law can be perceived as a stimulus of innovative entrepreneurship, by leveling, protecting, and enabling the innovative process.<sup>135</sup> In addition, the state is there when and where private innovators do not want to be. Underinvestment is a constant in multiple social policies (e.g., education, health care) or rare diseases since the expected returns are usually lower than the investment. To solve this problem, the state has developed programs to promote innovation regardless of high profit expectations. Think of orphan drugs and the FDA's efforts to promote innovation.<sup>136</sup>

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<sup>132</sup> See Mason, *supra* note 78, at 2.

<sup>133</sup> Fred Block & Matthew R. Keller, *Where Do Innovations Come From? Transformations in the U.S. Economy, 1970–2006*, 7 *SOC.-ECON. REV.* 459, 475–77 (2009) (“[O]ur data set provides evidence of . . . the expanded role of public sector institutions as both participants in and funders of the innovation process. . . . [T]he [U.S.] has changed fundamentally over the past three decades in the direction of smaller technology firms, more complex inter-organizational collaborations and a greater public sector role.”).

<sup>134</sup> See WEISS, *supra* note 1, at 78 (discussing how the collaboration between the National Security Service (NSS) and private contractors in the field of national security fostered innovation because the NSS absorbed the private sector risk and rewarded innovative types of defense that met the demanded requirements).

<sup>135</sup> See Viktor Mayer-Schönberger, *The Law as Stimulus: The Role of Law in Fostering Innovative Entrepreneurship*, 6 *I/S: J.L. & POL'Y FOR INFO. SOC'Y* 153, 155 (2010) (analyzing the “apparent tension between entrepreneurship and the law” and offering an “alternative conceptualization” of the role of law in the innovative process).

<sup>136</sup> Christopher-Paul Milne & Joyce Tait, *Evolution Along the Government–Governance Continuum: FDA's Orphan Products and Fast Track Programs as Exemplars of “What Works” for Innovation and Regulation*, 64 *FOOD & DRUG L.J.* 733, 743 (2009) (analyzing two FDA programs, the orphan-product and fast-track programs for biopharmaceuticals, where common regulation and governance instruments are used to foster innovation). The authors refer namely to push–pull incentives, problem-solving approaches, and old-style command-and-control. Milne and Tait characterize the difficult task of regulating science, technology, and innovation, where proactive regulations and governance instruments appear to be more effective than reactive ones. The authors refer to the difficulty of striking the balance between fostering innovation and maintaining a greater degree of top-down, regulation-based government intervention to control risk. Despite multiple challenges, the authors

Regulation can thus play multiple roles in the innovation race: (i) delay the commercialization of innovative products, as explained earlier; (ii) narrow the range of innovation paths, steering markets and firms towards a specific outcome or enabling new forms of innovation; (iii) keep innovation paths open, leaving the determinant decisions to “innovators”; or (iv) place itself on the demand side and impose certain means to achieve innovation.<sup>137</sup> These regulatory actions are not left unnoticed in the innovation process: some “break” while others “make” innovation.

In light of the complex interaction between regulation and innovation, the literature has observed that the advancement of innovation might entail hybrid incentives. In other words, innovation is often pursued as a private good, but it has a public-good nature,<sup>138</sup> and it may require, under certain circumstances, ex ante public-law incentives<sup>139</sup> (e.g., tax incentives or grants), but its future subsistence may as well be dependent on the timely grant of intellectual property rights. In addition, the regulation of innovation oscillates between the need to command the use of the safest technology and the freedom inherent to creativity and innovation.<sup>140</sup>

In the following Subsections, I focus on the positive influence of state intervention in the innovation process, analyzing the different roles played by the state. In this context, regulation can be conceived as a: (a) means to “force” technological advancement and encourage firms to innovate; (b) source of “bonuses” for innovators, i.e., regulation can facilitate innovation, notably by granting entrepreneurs exemptions or allowing public actors to deviate from existing legislation in order to experiment with more innovative policies and regulations (e.g., innovation waivers in § 1332 of the Affordable Care Act)<sup>141</sup> from complying with certain rules as long as these companies substantially invest in R&D, or authorizing companies to develop certain activities without further re-

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claim that “orphan grant-funded R&D has been very successful, as 86 percent of grantees reported that their programs had produced significant findings.”

<sup>137</sup> Nicholas A. Ashford & Ralph P. Hall, *The Importance of Regulation-Induced Innovation for Sustainable Development*, 3 SUSTAINABILITY 270, 280 (2011), <http://www.mdpi.com/2071-1050/3/1/270>.

<sup>138</sup> See Frischmann, *supra* note 122, at 358.

<sup>139</sup> See Joshua Chao, *Tax Incentives for Innovation in a Modern IP Ecosystem*, 15 VAND. J. ENT. & TECH. L. 753, 755 (2013); Daniel J. Hemel & Lisa Larrimore Ouellette, *Beyond the Patents–Prizes Debate*, 92 TEX. L. REV. 303, 308 (2013).

<sup>140</sup> Robert D. Cooter, *Freedom, Creativity, and Intellectual Property*, 8 N.Y.U. J.L. & LIBERTY 1, 2 (2013).

<sup>141</sup> With the Affordable Care Act’s State Innovation Waiver (§ 1332), commonly known as “2017 waivers” or “Wyden waivers,” states will be allowed to deviate from a number of key provisions of the ACA and experiment with their own solutions for health-care spending.

quirements;<sup>142</sup> or (c) channel for the regulation of financing means, notably subsidies granted to R&D projects. In this last case, the state is often the invisible hand behind multiple innovations, by providing essential funding where no one wants to invest (e.g., the development of the Internet was only possible with public investment), and exempting small businesses from complying with complex regulatory burdens, allowing them to shift more capital to R&D. In the past decade, we observed that the visible hand of the state is not only present as a force that controls and pushes back innovators, trying to solve market failures, but it is rather broadly interested in the advancement of innovation and engaged in the development of concrete initiatives together with private parties (e.g., public-private partnerships in the field of health care mentioned in the Affordable Care Act).<sup>143</sup>

### 1. *The State Solving Market Failures*

The state traditionally intervenes to solve market failures. The traditional rationale for providing patent protection met this goal: By providing a legal monopoly, individuals and firms would be willing to invest more in innovation than they otherwise would. This type of state intervention is welcome due to the presence of public goods—non-excludable and non-rivalrous goods—and thus can be easily appropriated by others without sharing the costs of the innovation.<sup>144</sup> Nowadays, the correlation between patents and innovation is not as widely accepted as in the past. Instead, it is surrounded by controversy.<sup>145</sup>

In the case of environmental innovation, firms do not have sufficient incentives to innovate because innovations in this area would produce positive externalities beyond the innovative firm. Gregory N. Mandel argues that the presence of this type of market failure would justify more active state intervention, namely through patents that would internalize externalities by rewarding innovators with patents for their environment-

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<sup>142</sup> See the example of securitization given by Ian M. Ramsay, *Financial Innovation and Regulation: The Case of Securitisation*, J. BANKING & FIN. L. & PRAC. 169, 173 (1993) (examining the case of Australian mortgage-backed securitization programs which exempted the issue and transfer of securities in a part of the country from stamp duty in order to foster innovation in the sector).

<sup>143</sup> See Patient Protection & Affordable Care Act § 3021, 124 Stat. 389, 390 (2012). An example is “Partnership for Patients.” See <http://innovation.cms.gov/initiatives/partnership-for-patients/>.

<sup>144</sup> See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 402 (Vicki Been et al. eds., 9th ed. 2014) (on the definition of public goods).

<sup>145</sup> See JESSICA SILBEY, *THE EUREKA MYTH: CREATORS, INNOVATORS, AND EVERYDAY INTELLECTUAL PROPERTY* 276–77 (2015) (discussing the role of intellectual property law in fostering and stifling creativity and innovation from the perspective of artists and inventors). Silbey concluded that intellectual property rights play a very limited role in the inventor’s creative process.



friendly inventions.<sup>146</sup> Mandel claims that “[l]aw must bring private environmental innovators’ incentives to innovate in line with the actual societal value of their potential inventions. Placing private innovators’ incentives in accord with the social value of innovation will lead private innovators to engage in the socially optimal level of innovation.”<sup>147</sup>

It might be hyperbolic to argue that the state “has always been there for innovation,” as this might not have been a conscious mission of the state in times of war and famine. The state has nevertheless regulated the most rudimentary forms of technology and the artisans or, more generally, the occupational groups controlling it.<sup>148</sup> Sector-specific regulation was designed to protect the implementation and misapplication of specific technologies.

## 2. *The State as the Framer of Innovation*

In this Subsection, I argue that state intervention should be able to do more for innovation than simply control risks and solve market failures: It can stimulate innovation by guaranteeing that there is sufficient competition among market players; make capital more easily available by regulating the relationship between creators and investors; generate reward mechanisms, demand and supply of innovation (in the field of public contracts); allow state actors to distinguish innovators with special needs; and attract foreign entrepreneurs by designing more attractive immigration rules.

Innovation (and the science and technology that make it possible) has been both the driving force of modernization and economic welfare, and the main cause for numerous recent risks and dangers. Multiple technological innovations call for a double role for law and regulation: on the one hand, promoting socially desirable innovations, and on the other, controlling risks.<sup>149</sup> There is nowadays a growing awareness of the

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<sup>146</sup> See Gregory N. Mandel, *Promoting Environmental Innovation with Intellectual Property Innovation: A New Basis for Patent Rewards*, 24 TEMP. J. SCI., TECH. & ENVTL. L. 51, 52 (2005) (arguing that intellectual property law should be used to stimulate environmental innovation). Because innovation in this sector often has positive externalities by reducing environmental harms for many individuals beyond the implementing firm, firms might need additional incentives to innovate in this context.

<sup>147</sup> See *id.* at 51–58.

<sup>148</sup> See BRENNER, *supra* note 106, at 18–19 (“Though technology regulation was not as pervasive in the ancient and medieval worlds as it is today, evolved tool technologies did produce rules—laws—that defined standards of conduct for the specialists who controlled particular technologies. . . . These laws focused on the application or misapplication of a specific technology and on the consequences each had for those who controlled that technology.”).

<sup>149</sup> Alfons Bora & Heiko Hausendorf, *Governing Technology Through Public Participation*, in DEMOCRATIC TRANSGRESSIONS OF LAW: GOVERNING TECHNOLOGY THROUGH PUBLIC PARTICIPATION 1, 1 (Alfons Bora et al. eds., 2010) (“During the last decades, major social conflicts were triggered by technological innovations such as

different roles to be played by regulation in the innovation process. Regulation is much more than a necessary evil to control risks and protect intellectual property rights.

The tentacles of regulation reach much further in the context of the advancement of innovation. This is visible, for example, in the memorandum on “the principles for regulation and oversight of emerging technologies” released in 2011 by the White House Emerging Technologies Interagency Policy Coordination Committee (ETIPC).<sup>150</sup> The Committee formulated a number of “principles of good regulation of innovation,” including the need to “promote more public participation, flexible legislation and legislative oversight.”<sup>151</sup> This effort to make regulation more flexible has been visible in recent attempts to accommodate extant rules to present and future technology. On February 15, the Federal Aviation Administration proposed a framework of regulations allowing routine use of certain small unmanned aircraft systems (UAS), “while maintaining flexibility to accommodate future technological innovations.”<sup>152</sup> This proposal offers safety rules for small UAS (under 55 pounds) conducting non-recreational operations. The rule would limit flights to daylight and visual-line-of-sight operations. These new rules are more flexible than general rules for heavier aircraft because, under the proposed rules, the operator of these small aircraft should be “at least 17 years old, pass an aeronautical knowledge test and obtain an FAA UAS operator certificate. To maintain certification, the operator would have to pass the FAA knowledge tests every 24 months.” However, “[a] small UAS operator would not need any further private pilot certifications (i.e., a private pilot license or medical rating).”<sup>153</sup> Transportation Secretary Anthony Foxx stated that because “[t]echnology is advancing at an unprecedented pace . . . this milestone allows federal regulations and the use of our national airspace to evolve to safely accommodate innovation.”<sup>154</sup> The adoption of more flexible rules—ideally for an experimental period, as I explain in Part III—is a step forward in the way we see and regulate

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nuclear power and biotechnology. . . . Against this background, the necessity of social regulation of science and technology emerges from the double need of socially promoting desirable innovations on the one hand and of controlling risks and socially unwanted developments on the other.”).

<sup>150</sup> See Memorandum from John P. Holdren, Dir., Office of Sci. & Tech. Pol’y. et al. to the Heads of Exec. Dep’ts & Agencies, Principles for Regulation and Oversight of Emerging Technologies (Mar. 11, 2011), <https://www.whitehouse.gov/sites/default/files/omb/inforeg/for-agencies/Principles-for-Regulation-and-Oversight-of-Emerging-Technologies-new.pdf>.

<sup>151</sup> *Id.*

<sup>152</sup> Press Release, Fed. Aviation Admin., DOT and FAA Propose New Rules for Small Unmanned Aircraft Systems (Feb. 15, 2015), [http://faa.gov/news/press\\_releases/news\\_story.cfm?newsId=18295](http://faa.gov/news/press_releases/news_story.cfm?newsId=18295).

<sup>153</sup> *See id.*

<sup>154</sup> *See id.*

innovation. However, this perspective needs to be materialized in concrete instruments, and included in the context of a broader approach to “innovation law.”

Innovation law is a field of research “very much in its infancy.”<sup>155</sup> This field of research starts out from the nature and determinants of innovation—as this Article also does—trying to understand this particular phenomenon, its multiple facets, and how different legal instruments can be employed to regulate and facilitate innovation. In addition, the regulation of innovation oscillates between the need to command the use of the safest technology and the freedom inherent to creativity and innovation.<sup>156</sup> The regulation of innovation may be: “hard” (in the sense of command-and-control regulation) or “soft” (e.g., private standards); technology- or information-forcing<sup>157</sup> or adaptable;<sup>158</sup> public (e.g., rule-making enacted by agencies) or the result of the collaboration between public and private entities (e.g., government contracts).

Innovation law is still in its infancy since the existing studies on innovation and law are still fairly limited to intellectual property (IP) law. IP appears to be the first—and often the only acronym—that comes to our mind when we are told that innovation also needs rules. Some of us might even whisper “competition laws,” thinking about the well-known Microsoft case. Administrative authorities are aware of the importance of innovation for a country’s competitiveness and have tried to actively encourage firms to innovate. This was the case of the U.S. Department of Justice’s command to Microsoft to sell its Internet Explorer as a separate product from its Windows operating system.<sup>159</sup> This idea that authorities should actively intervene can be indirectly derived from the “Porter hypothesis,”<sup>160</sup> according to which public authorities, and specifically competition authorities, should guarantee that market forces drive firms to

<sup>155</sup> See ORLY LOBEL, *TALENT WANTS TO BE FREE* 39 (2013); Stefan Müller, *Innovationsrecht—Konturen einer Rechtsmaterie* [Innovation Law—Outlining a Legal Field], 2 *INTEP* 58 (2013).

<sup>156</sup> Cooter, *supra* note 140, at 2.

<sup>157</sup> See, e.g., Nicholas A. Ashford & George R. Heaton, Jr., *Regulation and Technological Innovation in the Chemical Industry*, *LAW & CONTEMP. PROBS.*, Summer 1983, at 109–10, 112; Bradley C. Karkkainen, *Information-Forcing Environmental Regulation*, 33 *FLA. ST. U. L. REV.* 861 (2006).

<sup>158</sup> E.g., Stuart Minor Benjamin & Arti K. Rai, *Fixing Innovation Policy*, 77 *GEO. WASH. L. REV.* 1, 23, 29 (2008); Robert Cooter et al., *The Importance of Law in Promoting Innovation and Growth*, in *KAUFFMAN TASK FORCE ON LAW, INNOVATION AND GROWTH, RULES FOR GROWTH* 6 (2011); Floor Fleurke & Han Somsen, *Precautionary Regulation of Chemical Risk: How Reach Confronts the Regulatory Challenges of Scale, Uncertainty, Complexity and Innovation*, 48 *COMMON MKT. L. REV.* 357, 358, 380 (2011).

<sup>159</sup> See Lawrence B. Landman, *Competitiveness, Innovation Policy, and the Innovation Market Myth: A Reply to Tom and Newberg on Innovation Markets as the “Centerpiece” of “New Thinking” on Innovation*, 13 *ST. JOHN’S J. LEGAL COMMENT.* 223, 226 (1998).

<sup>160</sup> Michael Porter, *The Competitive Advantage of Nations*, *HARV. BUS. REV.*, Mar.–Apr. 1990, at 73, 87, 89.

innovate, namely through the implementation of stringent competition policy.<sup>161</sup> All these questions are still relevant nowadays, since despite the large investments in R&D and an increasing awareness of the role of the state in the innovation process, there is still no systematic legal approach to innovation beyond the traditional IP/antitrust approach.<sup>162</sup> Too little is known about the most adequate and efficient mix of legal and policy instruments to promote innovation.

Besides the longstanding IP/antitrust debate, other debates have emerged more recently in the context of innovation law. This is the case of the tension often debated in the literature between patent law and drug regulation: while the first is focused on rewarding pharmaceutical companies for their R&D investments and thus promoting innovation, the latter is often depicted as a hindrance to innovation due to lengthy procedures that attempt to protect public health.<sup>163</sup> Nowadays FDA regulation seems to be more attentive to innovation concerns and the promotion of innovation no longer seems to be exclusive to IP laws.<sup>164</sup> Instead, the state seems to be adopting a more active and even interventionist position in the advancement of innovation, for example, in the field of healthcare. Such a position seems to be welcomed by scholars that advocate for a broader access to knowledge and active state participation, namely through the induction of investment and creation of financial or reputational prizes.<sup>165</sup> In fact, a brief walk through the most recent legis-

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<sup>161</sup> For a critical perspective on Porter's hypothesis, see Landman, *supra* note 159, at 231–32.

<sup>162</sup> On the relationship between antitrust and innovation policy, see Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575, 576, 578 (2007) (comparing and contrasting Schumpeter's creative destruction doctrine of innovation and the claim that large firms are more innovative with Arrow's competition model, and discussing the role of antitrust enforcement in the promotion of innovation); Keith N. Hylton, *A Unified Framework for Competition Policy and Innovation Policy*, 22 TEX. INTEL. PROP. L.J. 163, 163–64 (2013) (“[C]ompetition and innovation policies are inextricably intertwined.”).

<sup>163</sup> Joseph A. DiMasi, Ronald W. Hansen & Henry G. Grabowski, *The Price of Innovation: New Estimates of Drug Development Costs*, 22 J. HEALTH ECON. 151, 151–52 (2003).

<sup>164</sup> See Rebecca S. Eisenberg, *The Role of the FDA in Innovation Policy*, 13 MICH. TELECOMM. & TECH. L. REV. 345, 347 (2007) (arguing that such a perception is nowadays outdated since more recent FDA regulation has “become an important adjunct to the patent system in protecting innovating firms from competition in product markets”).

<sup>165</sup> See Amy Kapczynski, *Access to Knowledge: A Conceptual Genealogy*, in ACCESS TO KNOWLEDGE IN THE AGE OF INTELLECTUAL PROPERTY 17, 24, 28 (Gaëlle Krikorian & Amy Kapczynski eds., 2010) (analyzing the problem of intellectual property rights and the access to medicine in developing countries and exploring different ways to internalize the negative externalities of intellectual property rights, while promoting innovation at the same time).

lation in public health can produce numerous encounters with legal dispositions that refer explicitly to the promotion of innovation.

Innovation law can also be perceived as an enabling framework for innovation in the sense that it empowers innovators to develop their ideas in a different legally relevant way, solving different dilemmas they might encounter. For example, innovators often face the so-called “double trust dilemma”: they might have brilliant ideas, but they do not have the capital to concretize them; investors have the money, but do not always understand fully innovative ideas. In this case, innovators are afraid of disclosing their idea to investors and having their ideas stolen, while investors are afraid of losing their money. We are confronted here with the “Solomon’s knot” of innovation and capital, which according to Robert Cooter and Hans-Bernd Schäfer, can be disentangled by law.<sup>166</sup> The knot is disentangled by providing private law mechanisms to enforce contracts between creators and investors and granting intellectual property rights to the inventors.<sup>167</sup>

The balance between “makers” and “takers” of wealth depends heavily on different fields of law designed to protect property, including contracts, crimes, finance, corporations, regulation, antitrust, labor law, taxation, and torts. Besides these fields of law, regulation might also play an enabling role for innovation if regulators adopt a flexible approach to the implementation of these instruments. As I explain in the next Part, this flexibility can be achieved by rethinking the timing of regulation.

### III: TIMING REGULATORY INTERVENTION

Thus far, this Article has discussed the nature of innovation and the need for broader and more enabling state intervention in the advancement of innovation. Having solved the problem of *why* the state should intervene (see Part II) and *what* the state is expected to regulate (see Part I), we arrive now at the point where we must ask *how* and *when* the state should regulate in order to play such an enabling role for innovation. In this Part, I argue that the regulation of innovative products and services, including sharing-economy platforms, could benefit from the enactment of *experimental regulations*, which confer an adaptable, temporary, and reviewable character to regulations; and *sunrise clauses*, which delay the coming into effect of regulations to a later stage, making it dependent on one or more conditions. These instruments have not received much attention in the law and technology literature. However, a more flexible approach to regulation can be useful to address the challenges posed by

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<sup>166</sup> COOTER & SCHÄFER, *supra* note 26, at 3, 30 (“Like the two rings, King Solomon held together two Jewish kingdoms, according to the Bible. Similarly, ideas and capital must unite to develop innovations and grow the economy. . . . Innovators and venture capitalists use various legal devices to overcome their mutual distrust.”).

<sup>167</sup> *Id.* at 223.

innovative digital platforms. As Yochai Benkler pointed out two decades ago, in light of the constant changes observed on the Internet, applying existing rules may not always succeed.<sup>168</sup> In 2015, this is particularly true due to the emergence of digital platforms that have drastically changed labor (e.g., with the growth of digital platforms like “TaskRabbit”), the way we perceive and consume services, and even certain goods. For example, digital platforms stimulate peer-to-peer rather than professional–consumer transactions and, for example, some platforms such as “Sulekha” even facilitates transactions within certain ethnical communities. In addition, digital platforms have revolutionized the supply of on-demand services that do not fit within traditional categories (e.g., with the smartphone application “Maven” female patients can request on-demand brief medical appointments often at a lower cost than copayments), as well as the tendency to rent rather than buy goods (such as tools with “1000tools” or prom dresses with “Rent the Runway”). In this context, we could imagine two solutions: regulate innovation by reference to general principles rather than specific rules,<sup>169</sup> or try to predict and accommodate the future evolution of technology either with adaptable rules or rules with a certain measure of (evidence-based) foresight. The two regulatory instruments suggested in this Part address these two perspectives.

#### A. *Innovation Experimentalism*

##### 1. *Background*

Legal experimentalism is both an old and new idea. On the one hand, the idea of trying out different rules for a determined period of time has deep roots in common law, and it was often used in the British Empire to test the effectiveness of new rules in overseas territories, adapting them to local specificities.<sup>170</sup> In the United States, this potential reminiscence of experimentalism has much to owe to Justice Brandeis and his states-as-laboratories metaphor<sup>171</sup>:

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<sup>168</sup> YOCHAI BENKLER, *RULES OF THE ROAD FOR THE INFORMATION SUPERHIGHWAY: ELECTRONIC COMMUNICATIONS AND THE LAW* 39 (1996) (“Attempting to apply existing formal rules to new technologies may sometimes succeed, but there is no reason to think that it will succeed systematically. Most problems raised by digital technology are likely to be solved by reference to general principles rather than specific rules.”).

<sup>169</sup> See generally John Braithwaite, *Rules and Principles: A Theory of Legal Certainty*, 27 *AUSTL. J. LEGAL PHIL.* 47 (2002).

<sup>170</sup> See James Williams, *Experiment in Legislation*, 14 *LAW MAG. & L. REV.* 299, 299–300 (1889) (providing a historical overview of the use of experiments in Europe and arguing that the roots of this type of legislation can be traced back to Ancient Greece). In the 19th century, the economist Jevons also argued that experimental legislation should be used to regulate certain sectors like liquor. See William S. Jevons, *Experimental Legislation and the Drink Traffic*, 37 *CONTEMP. REV.* 177, 179 (1880).

<sup>171</sup> *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1931) (Brandeis, J., dissenting). See also G. Alan Tarr, *Laboratories of Democracy? Brandeis, Federalism, and*

It [was] one of the happy accidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.<sup>172</sup>

Brandeis' dissent can be interpreted as both a plea for federalism and for the power to experiment and innovate with policy and lawmaking.<sup>173</sup> Although this metaphor and the implications of experimentalism for federalism will not be further analyzed in the context of this Article, it is important to note that legal experiments have not been limited to the state level. In fact, the idea that only federal jurisdictions could experiment with laws and allow states to learn from each other has been widely discussed in the literature.<sup>174</sup> State and local entities might have more incentives to experiment with different policy solutions because "different populations will have different policy goals."<sup>175</sup> However, as Rubin and Feeley argue, the existence of federalism is not a necessary condition to be able to experiment with laws.<sup>176</sup> Rather, the most important element here is the existence of multiple truth-seekers, which we also find at the federal level.<sup>177</sup> Although this Article does not adopt a comparative legal perspective, legal experimentalism is also put into practice in European unitary jurisdictions by national actors.<sup>178</sup>

More recently, the literature has defended similar approaches to experimentalism in non-federalist contexts. The most important and current contribution to the development of a more pragmatic and experimentalist approach to policy and rulemaking has been made by Charles Sabel in collaboration with a number of scholars including Michael Dorf and Jonathan Zeitlin.<sup>179</sup> Sabel's scholarship has referred to both the Unit-

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*Scientific Management*, 31 PUBLIUS 37, 40–42 (2001) (exploring whether Brandeis' metaphor was a praise for federalism or for evidence-based lawmaking).

<sup>172</sup> *Liebmann*, 285 U.S. at 311.

<sup>173</sup> See James A. Gardner, *The "States-as-Laboratories" Metaphor in State Constitutional Law*, 30 VAL. U. L. REV. 475, 483 (1996) (arguing that Brandeis was mainly praising federalism with the state-as-laboratories metaphor); Daniel O. Conkle, *Free Exercise, Federalism, and the States as Laboratories*, 21 CARDOZO L. REV. 493, 494–95 (1999); THOMAS K. McCRAW, *PROPHETS OF REGULATION* 135–36 (1984).

<sup>174</sup> See Part I, *supra*, on the link between experimental legislation, innovation and the value of diversity.

<sup>175</sup> See Yair Listokin, *Learning Through Policy Variation*, 118 YALE L.J. 480, 513 (2008).

<sup>176</sup> See MALCOLM M. FEELEY & EDWARD RUBIN, *FEDERALISM: POLITICAL IDENTITY AND TRAGIC COMPROMISE* 26 (2008).

<sup>177</sup> See *id.*

<sup>178</sup> See RANCHORDÁS, *supra* note 12, at 25; Gestel & Van Dijck, *supra* note 14, at 540.

<sup>179</sup> See generally on democratic experimentalism, Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267 (1998); see also Ronald J. Gilson, Charles F. Sabel & Robert E. Scott, *Contract and Innovation: The Limited Role of Generalist Courts in the Evolution of Novel Contractual Forms*, 88 N.Y.U. L.

ed States and European contexts.<sup>180</sup> His theory of democratic experimentalism suggests a framework based on deliberation, informality, and multi-level governance. This model lays down the pillars for an adaptable, experimental, and learning approach to a number of policies.<sup>181</sup> Democratic experimentalism starts out from the possibility to divide the territory—not necessarily within the limits of federalism—or society in small subunits. These subunits are then given the competence to define their own goals and select the means to attain them. In addition, these “decentralized units” are provided with the possibility to adapt national policies to their needs and experiment with new solutions. Experimentalism is thus a “jurisprudence of problem-solving,” according to which actors gather to directly deliberate on answers to common problems.<sup>182</sup> Democratic experimentalism conveys a learning approach that can be useful for the regulation of innovative fields characterized by a multiplicity of actors and interests; the need to take into account sectorial specificities; and complexity as to the subject matter to be regulated. This model implies three different steps of the learning process: first, the fine-tuning of already existing policy instruments; second, the need to maintain a set number of goals but ensure that the instruments used to concretize are frequently changed; and third, altering the goals themselves.<sup>183</sup> Furthermore, democratic experimentalism also emphasizes mutual learning since actors from other subunits who have comparable problems can learn from the ones engaging in experiments.<sup>184</sup>

In this Article, I translate the theoretical model of democratic experimentalism to the world of regulation of digital platforms as a source of inspiration for other innovative products and services, where we can conceive of temporary and adaptable regulations with an experimental character. These regulations are designed to test the effectiveness of legal provisions to regulate innovative technologies, allow stakeholders to provide feedback on their effectiveness, and help regulators adapt and re-

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REV. 170, 176–77 (2013); Charles F. Sabel & William H. Simon, *Minimalism and Experimentalism in the Administrative State*, 100 GEO. L.J. 53, 78 (2011).

<sup>180</sup> For an overview of the implementation of democratic experimentalism in the European Union, see generally EXPERIMENTALIST GOVERNANCE IN THE EUROPEAN UNION 2 (Charles F. Sabel & Jonathan Zeitlin eds., 2010).

<sup>181</sup> Dorf & Sabel, *supra* note 179, at 314–22.

<sup>182</sup> Michael Wilkinson, *Between Constitutionalism and Democratic Experimentalism? New Governance in the E.U. and the U.S.*, 70 MOD. L. REV. 680, 686 (2007) (providing a critical overview of democratic experimentalism).

<sup>183</sup> See David M. Trubeck & James S. Mosher, *New Governance, Employment Policy, and the European Social Model*, in GOVERNING WORK AND WELFARE IN A NEW ECONOMY: EUROPEAN AND AMERICAN EXPERIMENTS 33, 46 (Jonathan Zeitlin & David M. Trubeck eds., 2003) (referring mainly to the work of Peter Hall on social learning); Peter Hall, *Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain*, 25 COMP. POL. 275, 275 (1993).

<sup>184</sup> Dorf & Sabel, *supra* note 179, at 288.



think regulations on the grounds of the collected evidence. I call them “experimental regulations” because, ideally, they should be temporary, imbued with a learning spirit, and enacted at first for a small group (for example, in a city or a representative part of the jurisdiction) in order to minimize risks and test the effects of the new rules on a small-scale basis.

The term “experimental regulations” might be relatively unknown in the literature and it may even sound antithetic to the idea of law: the idea of experimenting with laws appears to oppose the scientific method based on trial and error to the traditional certainty of law. Indeed, a potential explanation for the skepticism against legal experimentalism lies in the apparent resemblance to scientific experiments.<sup>185</sup> This perception could potentially feed our imagination on cruel scientific experiments and suggest the idea that legislators could be tempted to experiment with fundamental rights and freedoms of citizens.<sup>186</sup> In addition, the experimental method was initially rejected by social sciences and restricted to natural sciences.<sup>187</sup> In the field of political science, for example, the initial disinclination toward the experimental method was haunted by Lawrence Lowell’s traditional claim: “[W]e are limited by the impossibility of experiment. Politics is an observational, not an experimental, science.”<sup>188</sup> Nowadays, experimentalism has earned its place in experimental political science, as well as in other social sciences.<sup>189</sup> The use of experimental methods in economics seems to have gained more importance in the last few years, for example, thanks to the award of the Nobel Prize in 2002 to Vernon Smith.<sup>190</sup> Experimental approaches to economics and, for example, competition policy can provide valuable insights on the behavior of firms in relation to various forms of competition policy.<sup>191</sup> Experimental-

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<sup>185</sup> See also Christoph Engel, *Legal Experiments: Mission Impossible?*, Inaugural Lecture at Erasmus University School of Law at Rotterdam 8 (2013), <http://ssrn.com/abstract=2276566> (analyzing legislative experiments).

<sup>186</sup> Famous and controversial experiments with citizens that are often invoked to reject experimentalism include the “Stanford Prison Experiment.” See Philip G. Zimbardo, *On the Ethics of Intervention in Human Psychological Research*, 2 *COGNITION* 243, 246 (1973).

<sup>187</sup> John Gerring & Rose McDermott, *An Experimental Template for Case Study Research*, 51 *AM. J. POL. SCI.* 688, 688 (2007).

<sup>188</sup> A. Lawrence Lowell, *The Physiology of Politics*, 4 *AM. POL. SCI. REV.* 1, 7 (1910); see also James Druckman et al., *The Growth and Development of Experimental Research in Political Science*, 100 *AM. POL. SCI. REV.* 627, 627 (2006).

<sup>189</sup> See generally *CAMBRIDGE HANDBOOK OF EXPERIMENTAL POLITICAL SCIENCE* (James N. Druckman et al. eds., 2011).

<sup>190</sup> *Vernon L. Smith—Facts*, NOBELPRIZE.ORG, [http://www.nobelprize.org/nobel\\_prizes/economic-sciences/laureates/2002/smith-facts.html](http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/2002/smith-facts.html) (2016).

<sup>191</sup> For the different applications of experimental economics in the field of competition policy, see *EXPERIMENTS AND COMPETITION POLICY* 1, 185, 217, 231, 267, 301 (Jeroen Hinloopen & Hans-Theo Normann eds., 2009) (addressing a number of competition policy issues such as mergers, uncompetitive auctions, and competition-policy enforcement from an experimental economics perspective).

ism in law does not, however, mean that laws should be manufactured in laboratories. Instead, the real world is seen as the laboratory where the effectiveness of rules is put to the test. Experimental regulations are thus enacted for a fixed period, and the experiment is performed in a sample group, which should be representative of the whole population.

## 2. *Experimental Regulations*

As the adjective “experimental” suggests, experimental regulations are rules that are not permanent but only last a certain period because they are being “put to the test.” Experimental regulations can be defined as regulations that are enacted on an experimental basis in derogation of existing law for a previously determined duration, for a limited group of citizens or territory selected on the grounds of objective criteria, and which are subject to a periodic or final evaluation.

The first element of experimental regulation is the temporary character: An experimental regulation should include a sunset clause that determines its limited duration. This means that experimental regulations sunset at the end of a number of years, unless they are reauthorized. The duration of experimental regulations is heavily dependent on the evolution cycle of the industry: while some sectors like the sharing economy evolve rapidly and deliver new “gig” platforms on a regular basis, others are not characterized by heavy innovation, taking longer to change (e.g., health care).

The duration of the experiment should be defined according to its main objective and the characteristics of the sector, notably the speed of social or technological change and the expected subjects’ responses to the introduction of new laws.<sup>192</sup> Sharing-economy platforms are characterized in general by rapid changes, but not all the effects and side-effects of the “gig economy” are visible in the short-run. The precise duration of an experiment can only be casuistically defined. However, an important guideline to follow is that the duration of experiments should take into account the characteristics of the sector and should last long enough to allow the gathering of meaningful results.

Adequate duration is a key effectiveness element of any temporary law, including sunset clauses. This was one of the deficiencies of the production tax credits designed to stimulate investment in renewable energy and advance clean-energy innovation. These tax credits were subject to a sunset, renewable for three years. However, it takes three to seven years to develop a wind farm, which meant that the uncertainty regarding the renewal of the tax credit slowed down long-term investment.<sup>193</sup>

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<sup>192</sup> See RANCHORDÁS, *supra* note 12, at 112–13.

<sup>193</sup> Erin Dewey, Note, *Sundown and You Better Take Care: Why Sunset Provisions Harm the Renewable Energy Industry and Violate Tax Principles*, 52 B.C. L. REV. 1105, 1112 (2011).

The second element of experimental regulation is the restricted applicability of the experimental rules; in other words, the new rules should only be applied to one group. An experimentalist approach always implies having a control—and a sample—group so that the results of the experiments can be compared.<sup>194</sup> In law, this can be achieved by derogating from existing regulations or waiving certain requirements (e.g., a group of small sharing-economy platforms would not be required to observe the rules under trial).

The third element of experimental regulation is the performance of an evaluation, which is a necessary step for the implementation of experimental legislation. The main idea behind experimental laws is to try out a new legal regime, see if it works, and learn from the positive and negative effects observed. This is why a periodic or final evaluation performs such an important role in this context: the evaluation is regarded as an opportunity to rethink the objective of the experiment and decide whether the rules tried out can be extended to the rest of the population and consequently converted into general lasting rules. The implementation of an experimental law is a learning process, which implies incorporating new information and updating existing regulations in light of new circumstances.

In order to guarantee that experimental regulations are indeed put at the service of the advancement of innovation and are part of a learning approach to regulation, experiments should be adequately evaluated. The acceptance and reputation of experimental regulations, as well as the validity of the experimental results can be endangered if there is a widespread perception that this type of legislative instrument is never satisfactorily evaluated. This occurred for example in the case of the “sunset boom” that took place in the 1970s and 1980s at the state level.<sup>195</sup> A significant number of sunset clauses were enacted in that period with the goal of terminating obsolete regulations, policy programs, and agencies. However, it was soon clear that most sunset clauses were ad nauseam reauthorized and what was supposed to be temporary soon became permanent.<sup>196</sup>

Clear and previously known criteria, periodic evaluations, the participation of stakeholders, and the public character of this process can en-

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<sup>194</sup> The execution of experiments in natural and social sciences implies an objective and careful selection of the composition and randomization of these two groups.

<sup>195</sup> Richard C. Kearney, *Sunset: A Survey and Analysis of the State Experience*, 50 PUB. ADMIN. REV. 49, 49 (1990).

<sup>196</sup> See GUIDO CALABRESI, A COMMON LAW FOR THE AGE OF STATUTES 1, 6 (1982). This seminal work criticized the obsolescence of the then-existing statutes and discussed the possibility of using sunset clauses to solve this problem. Evaluating the effectiveness of sunset clauses to terminate obsolete regulations and agencies, see Kearney, *supra* note 195, at 52.

hance the transparency and accountability of the enactment and implementation of experimental regulations. For example, the publication of the evaluation report on the federal agency's website can promote the transparency of experiments.<sup>197</sup> The definition of transparent criteria and the public character of the evaluation report cannot be interpreted as a way of strictly holding regulators to the obtained results. Regulators have discretion to decide on the enactment of an experimental law and on the sense of its future revision. However, whenever legislators and regulators decide to deviate from the results of the experiment, they should be burdened with an enhanced duty to give reasons for their choice. This position was adopted in *Public Service Commission for the State of New York v. Federal Power Commission*.<sup>198</sup> In this case, the Federal Power Commission engaged in a number of experiments but did not follow up on the results obtained. The court criticized this federal agency for not having engaged in "a meaningful review, analysis, and evaluation of the experience" obtained in the experiment on advance payments:<sup>199</sup>

The data presented by the Commission as a justification of its repeated extensions of the advance payments program provide an inadequate basis from which "to determine whether its justifying objectives are being satisfactorily met at an acceptable level of ultimate economic cost of the nation's gas consumers."<sup>200</sup>

The court remanded the case for "further evidence and consideration by the [Federal Power Commission]."<sup>201</sup>

In this Article, I do not claim that experimental regulations should replace permanent regulations altogether. Instead, I argue that the enactment of temporary rules with an experimental character could be beneficial when regulators are confronted with high uncertainty. This is often the case of sectors that are characterized by fast or disruptive changes that might not represent great harms to public health or safety if actors comply with adequate—but not necessarily traditional—requirements (e.g., the emergence of Uber or Lyft in the transportation sector).<sup>202</sup> A dynamic approach to regulation might be required to guarantee constant adaption to social needs and technological innovation. Under a scenario of limited and rapidly changing information, experi-

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<sup>197</sup> See, e.g., *Retrospective Review History*, U.S. ENVTL. PROTECTION AGENCY, <http://www.epa.gov/laws-regulations/retrospective-review-history>.

<sup>198</sup> 511 F.2d 338, 344 (D.C. Cir. 1975).

<sup>199</sup> *Id.* at 342.

<sup>200</sup> *Id.* (quoting *Public Serv. Comm'n N.Y. v. Fed. Power Comm'n*, 467 F.2d 361, 371 (D.C. Cir. 1972)).

<sup>201</sup> *Id.*

<sup>202</sup> Daniel A. Farber, *Environmental Protection as a Learning Experience*, 27 *LOY. L.A. L. REV.* 791, 798 (1993).

mental regulations are capable of being the most adequate instruments.<sup>203</sup>

Experimental regulations address uncertainty in the innovation process by allowing regulators to authorize, for example, a new but expanding electricity-sharing platform (Community Power Network) in a few neighborhoods of Washington, D.C. and the surrounding area, or, in the Netherlands the platform “VandeBron” that mediates the acquisition of electricity directly from a local farmer with excess electricity from solar panels, and then observe whether the collaborative practice is operating without endangering consumers.<sup>204</sup> Experimental regulations would help regulators obtain the information that regulators often struggle to obtain from private actors, namely as to the risks of their innovative activities.<sup>205</sup>

The regulation of innovation uncovers a double cognitive bias (information asymmetries and lack of information), which constitutes a valid justification for enacting temporary legislation.<sup>206</sup> Experimenting with new regulations is a method of gathering more information and overcoming this cognitive bias. This can contribute to the improvement of the rulemaking process and guarantee that regulators turn to evidence-based lawmaking, and “reason informed by experience” with a strong “potential for self-correction.”<sup>207</sup> As Robert Seidman explains, such a potential implies the adoption of devices for testing and improving legislation in the light of the gathered experience, including temporary rules.<sup>208</sup>

Information is produced through different actions celebrated in recent literature: repeated interaction, frequent peer-reviews, and by the adoption of a learning-by-doing approach to regulation of innovation.<sup>209</sup> It is difficult to compel firms to produce information, but the required information can be more easily provided over time through repeated interaction.<sup>210</sup> This repeated interaction is notably enabled by sunset clauses

<sup>203</sup> *Id.*

<sup>204</sup> Matthew Crosby, *Will There Ever Be an Airbnb or Uber for the Electricity Grid?*, GREENTECH MEDIA (Sept. 8, 2014) <http://www.greentechmedia.com/articles/read/an-airbnb-or-uber-for-the-electricity-grid> (“Netherlands-based Vandebron (literally translated as ‘from the source’) launched a platform similar to [Vacation Rents by Owner], which allows individuals to buy electricity straight from a local farmer with excess electricity production from solar PV panels or biogas-to-power installations. . . . In this example, farmers receive a higher compensation from the platform per unit of electricity than they would selling their power to traditional utilities.”).

<sup>205</sup> Cary Coglianese et al., *Seeking Truth for Power: Informational Strategy and Regulatory Policymaking*, 89 MINN. L. REV. 277, 278–79 (2004).

<sup>206</sup> Jacob E. Gersen, *Temporary Legislation*, 74 U. CHI. L. REV. 247, 262–68 (2007).

<sup>207</sup> Robert B. Seidman, *Justifying Legislation: A Pragmatic, Institutional Approach to the Memorandum of Law, Legislative Theory, and Practical Reason*, 29 HARV. J. LEGIS. 1, 18 (1992).

<sup>208</sup> *Id.*

<sup>209</sup> Coglianese et al., *supra* note 205, at 311, 333; Seidman, *supra* note 207, at 75.

<sup>210</sup> Coglianese et al., *supra* note 205, at 311.

and experimental legislation. Thanks to the temporary character and periodic evaluation of these instruments, lawmakers can easily incorporate the information obtained either through observing the effects of the laws in question, by acknowledging the results of the participation of stakeholders, or taking into account the evaluation reports. Zachary Gubler claims that regulators would be able to deliver regulation based on more accurate information if they would divide the decision-making process into different stages, and as more information is produced in the first experimental phase, they could then adapt regulations accordingly.<sup>211</sup>

The regulation of innovative products and services is not only characterized by the lack of information but also by emergent risks and uncertainty that may be difficult to tackle. Gersen suggests the employment of temporary legislation—a concept that also includes sunset clauses and experimental legislation—as a means to tackle social, legal, or economic problems or situations characterized by *uncertainty*.<sup>212</sup> This uncertainty can refer to the duration, complexity, or effects of the latter. When little is known about these types of situations, a temporary legislative measure can be a safe option that provides for an immediate remedy for a problem without putting the whole population at stake, but which, at the same time, can be easily extinguished. Experimental regulations offer the required flexibility to deal with temporary problems or problems characterized by acute uncertainty, or to enact policies where little is known and the risk of error is high.<sup>213</sup> In addition, experimental regulations have the advantage of improving the efficiency gains of legislation because they are based on superior information.<sup>214</sup>

Even if the enactment of a rule is preceded by *ex ante* studies and consultations, there is still uncertainty as to its effects and the best legislative or regulatory approach to the problem in question. Only after a regulation has been implemented for a reasonable period will regulators be able to observe and evaluate these effects. The underlying idea is simple: rules that are ineffective can be improved based on the feedback received from stakeholders and citizens.<sup>215</sup> Regulators can therefore use experimental regulations so as to gather information and, given this informational advantage, proceed to the correction of errors. Even opponents of temporary legislation have acknowledged that temporary regulations have been used as an instrument to assess the risks and effects of a new policy as well as to obtain more information about it during the interim

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<sup>211</sup> Zachary J. Gubler, *Experimental Rules*, 55 B.C. L. REV. 129, 130–31 (2014).

<sup>212</sup> Gersen, *supra* note 206, at 248.

<sup>213</sup> Questioning this argument, see Rebecca M. Kysar, *Lasting Legislation*, 159 U. PA. L. REV. 1007, 1012 (2011).

<sup>214</sup> Tom Ginsburg et al., *Libertarian Paternalism, Path Dependence, and Temporary Law*, 81 U. CHI. L. REV. 291, 326 (2014).

<sup>215</sup> *See id.*

period between the enactment and the sunset.<sup>216</sup> Temporary regulations, including experimental regulations, are expected to be popular in policy contexts characterized by uncertainty, scarce or unreliable information, and the existence of a number of risks.<sup>217</sup>

### 3. *Temporary Regulations and the Sharing Economy*

The idea of enacting temporary and experimental regulations to regulate innovative practices, such as sharing-economy platforms, is not merely theoretical. Instead, throughout the United States, we have witnessed a tendency and even a growing number of requests to enact interim regulations and allow, for example, Uber and Lyft to start operating while regulators decide on a new and more permanent regulatory framework.

In 2014, the first temporary legal framework was enacted in Virginia, allowing Uber and Lyft to operate. This pioneer legal framework resulted from extensive discussions between the companies, the Virginia Department of Motor Vehicles, the McAuliffe administration, and Attorney General Herring's office.<sup>218</sup> As suggested earlier in this Article, this temporary framework was designed to serve as "the foundation" for a more permanent legal framework that would be enacted once more information about the risks and opportunities of Uber and Lyft became available.<sup>219</sup> The Virginia DMV is currently studying this information in order to develop a long-term legislative solution that addresses services provided by Uber, Lyft, and similar companies, while also ensuring a level playing field for taxicabs and all other passenger transportation services.<sup>220</sup> In Colorado, temporary rules for Uber and Lyft have been in place since 2014, while the Public Utilities Commission crafts more permanent safety regulations.<sup>221</sup> The temporary regulations require driver health exams and car inspections. However, many states and local governments are still currently trying to gather sufficient information about this new transportation system, which will allow for more stable regulation of the transportation sector.<sup>222</sup>

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<sup>216</sup> Kysar, *supra* note 213, at 1041–42.

<sup>217</sup> John E. Finn, *Sunset Clauses and Democratic Deliberation: Assessing the Significance of Sunset Provisions in Antiterrorism Legislation*, 48 COLUM. J. TRANSNAT'L L. 442, 451 (2010).

<sup>218</sup> Press Release, Off. of Gov. Terry McAuliffe, Virginia Reaches Temporary Agreement to Allow Safe, Regulated Operation of Uber and Lyft (Aug. 6, 2014), <http://governor.virginia.gov/newsroom/newsarticle?articleId=5726>.

<sup>219</sup> *Id.* ("This temporary authority agreement can serve as a foundation for potential legislation and will also provide valuable data on the operations of these companies as legislation is crafted.")

<sup>220</sup> Ben Markus, *Uber, Lyft Could Soon Face Tighter Restrictions in Colorado*, COLO. PUB. RADIO (Jan. 14, 2015), <http://www.cpr.org/news/story/uber-lyft-could-soon-face-tighter-restrictions-colorado#sthash.UOoLCom6.dpuf>.

<sup>221</sup> *Id.*

<sup>222</sup> *Id.*

Portland is another example of a city that authorized Uber and Lyft to operate on “experimental terms” by including the regulation (or de-regulation, depending on one’s perspective) of these platforms in a pilot project. This pilot required Uber and Lyft to comply with a number of rules including the provision of access to disabled users.<sup>223</sup> The objective of this pilot was to collect information about the opportunities and risks for consumers and other stakeholders and later recommend permanent rules. The pilot was supposed to have the initial duration of four months but its duration was extended in August 2015.<sup>224</sup> After six months, permanent rules were recommended, including rules for how many drivers can work in the city and even rules for wheelchair accessible vehicles. Uber and Lyft are currently required to comply with City of Portland regulations similar to that of the taxi companies. This includes insurance requirements, citywide service, and access for people with disabilities.<sup>225</sup>

In March 2015, Uber was authorized on a temporary basis to continue operating in Palm Beach County without paying the required county fees or complying with local vehicle-for-hire regulations.<sup>226</sup> This “temporary deal” allows Uber to offer rides through September, without facing fines, while the county considers changing its regulations to accommodate the popular ride-scheduling service.<sup>227</sup> In addition, the temporary character of these rules does not seem to be off-putting to citizens or the companies involved. In Austin, for example, a petition was initiated, requesting that “interim regulations for Transportation Network Companies (such as Uber and Lyft) be put into place so that these companies [could] temporarily operate until a permanent legal framework [was] established.”<sup>228</sup> However, the “temporary” character of the regulation of these sharing-economy platforms has also been applied to the prohibition of these companies to operate in some states. This is the case of Nevada, where a district court temporarily suspended the activities of Uber and Lyft while the Nevada Transportation Authority drafts a permanent

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<sup>223</sup> Shelby Sebens, *Uber Returning to Portland Under City-Approved Regulations*, REUTERS (Apr. 22, 2015), <http://www.reuters.com/article/us-usa-oregon-uber-idUSKBN0ND0CR20150422>.

<sup>224</sup> Elliot Njus, *New Rules Proposed for Taxis, Uber, Lyft*, OREGONLIVE (Oct. 29, 2015), [http://www.oregonlive.com/commuting/index.ssf/2015/10/new\\_rules\\_proposed\\_for\\_taxis\\_u.html](http://www.oregonlive.com/commuting/index.ssf/2015/10/new_rules_proposed_for_taxis_u.html).

<sup>225</sup> *FAQ: Taxi and Other Private For Hire Transportation*, CITY OF PORTLAND, <http://www.portlandoregon.gov/transportation/article/511916>.

<sup>226</sup> Andy Reid, *Uber Gets Temporary Deal to Stay in Palm Beach County*, SUN SENTINEL (Mar. 10, 2015), <http://www.sun-sentinel.com/local/palm-beach/fl-uber-deal-decision-palm-20150310-story.html>.

<sup>227</sup> *Id.*

<sup>228</sup> *See Create Temporary Regulations for Rideshares/TNCs Now*, CHANGE.ORG (Aug. 16, 2014), <https://www.change.org/p/city-of-austin-texas-create-temporary-regulations-for-rideshares-tnc-s-now#petition-letter>.



regulatory framework for these sharing platforms.<sup>229</sup> In July 2015, the Nevada Transportation Authority was still working on the enactment of a new regulatory framework for Uber, Lyft, and similar companies.<sup>230</sup>

In Europe, despite the legal challenges faced by Uber, some cities have initiated regulatory and policy experiments in order to promote their “sharing potential” and promote collaborative initiatives. This is the case of Manchester and Leeds, which in 2015–2016 will implement pilot programs to experiment with ride-sharing, social, and health-care collaborative programs. For example, the sharing city pilots include “exploring the possibility of replacing local council car fleets with car club membership; opening up more parking bays to car club parking; [and] considering new street parking for car clubs.”<sup>231</sup> Leeds City Region will be used for a pilot on ride-sharing and the use of digital platforms to improve the efficiency of local transport. These experiments will be supported by new smartphone applications designed for a fully integrated transport system based on mobility accounts. These applications can be used for buses, trains, car clubs, taxis, and bike services. However, this region will also extend the pilot project to the creation of other online platforms that seek to promote the use of untapped local resources, which might range from unused warehouses to equipment such as lawnmowers.<sup>232</sup> The Manchester pilot scheme is focused on social policies and, according to the British government, it aims to “enable Greater Manchester to generate deeper insight into and generate an understanding of what is important to individuals and communities, map community assets and their utilization.”<sup>233</sup> This pilot will develop hubs and micro-enterprises, promote the use of new technologies in health care (e.g., mobile health applications) and social policies, and encourage volunteering. As a result of this pilot, Greater Manchester should be able to explore different approaches that will allow the city to transition from significant “dependence on traditional health and social care services to enabling independence, self-reliance and strengthening community resilience, whilst tackling root

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<sup>229</sup> Tim Bradshaw, *Uber Forced to Stop Operating in Nevada*, FIN. TIMES (Nov. 27, 2014), <http://www.ft.com/cms/s/0/20e37a96-7661-11e4-a704-00144feabdc0.html#axzz3hPiLIVEC>.

<sup>230</sup> Richard N. Velotta, *Uber, Lyft Face Steep Costs for Nevada Licensing*, LAS VEGAS REV. J. (Jul. 16, 2015), <http://www.reviewjournal.com/business/uber-lyft-face-steep-costs-nevada-licensing>.

<sup>231</sup> Jack Tang, *Why the UK Is the Home of the Sharing Economy*, DIRECTOR (Oct. 9, 2015), <http://www.director.co.uk/11933-2-why-the-uk-is-the-home-of-the-sharing-economy/>.

<sup>232</sup> U.K. DEP'T FOR BUSINESS, INNOVATION, & SKILLS, INDEPENDENT REVIEW OF THE SHARING ECONOMY: GOVERNMENT RESPONSE 4 (2015), [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/414111/bis-15-172-government-response-to-the-independent-review-of-the-sharing-economy.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414111/bis-15-172-government-response-to-the-independent-review-of-the-sharing-economy.pdf).

<sup>233</sup> *Id.*

causes of anxiety and social isolation for individuals.”<sup>234</sup> In the context of these experiments and in order to make a more efficient use of government funds, civil servants are being urged to use ride-sharing and home-sharing platforms such as Uber and Airbnb.<sup>235</sup>

As the need to regulate sharing-economy platforms increases and the sharing economy continues evolving, the adoption of temporary regulations with an experimental character might be the solution that cities, platforms, and consumers are looking for. An alternative would be to delay regulation to a later stage, when the sharing economy has reached a higher degree of maturity and more information is available. As the following Section explains, the use of sunrise clauses could dictate that such rules lie dormant until this moment.

### B. *Sunrise Clauses*

Sunrise clauses in the regulatory or legislative contexts perform a similar function to that of condition-subject clauses in contracts: a disposition is included in a regulation but it lies dormant until a certain condition is verified. For example, with an eye on the future, regulators can establish that driverless cars will be allowed to circulate in the streets and operate as taxicabs *when* and *if* they are able to pass certain road safety tests. By making the coming-into-effect of a law dependent on a future condition, regulators can avoid unnecessary regulation, allowing the industry to mature and invest in the technicalities which might be necessary to comply with certain standards. Since the literature has devoted very little attention to sunrise clauses and contingent regulation, this Section provides a glimpse of the functions and challenges posed by these regulatory instruments.

Sunrise clauses are regulatory or legislative instruments that fit within the broad category of contingent legislation; that is, legislation that bears an element of conditionality. These provisions have not been discussed in the context of the regulation of the sharing economy and they have been used to a very limited extent in other regulatory contexts. From a normative perspective they offer however an alternative to stringent regulation, allowing regulators to regulate present technologies and require innovators to take into account certain dispositions in future technological development (for example, by imposing specific and stricter safety standards with which autonomous vehicles to be used for ride-sharing platforms must comply).

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<sup>234</sup> *Id.*

<sup>235</sup> Andrew Trotman, *Budget 2015: Civil Servants Urged to Use Car-Sharing Apps and Airbnb to Save Money*, TELEGRAPH (Mar. 18, 2015), <http://www.telegraph.co.uk/finance/budget/11480519/Budget-2015-Civil-servants-urged-to-use-car-sharing-apps-and-Airbnb-to-save-money.html>.

Sunrise clauses have been present mainly at the state level as “sunrise reviews.” These reviews aim to assess the strict necessity of regulation to protect consumers and they have been enacted in a number of states.<sup>236</sup> Sunrise reviews are two-step tests or assessments that aim to verify whether the legislature should enact legislation to regulate an “as of yet unregulated profession or occupation in order to protect the health, safety, or welfare of the public.”<sup>237</sup> While sunset clauses and sunset reviews are designed to trigger the termination of unnecessary regulations after a certain period, sunrise reviews trigger the coming-into-effect of new rules based on the same necessity judgment.<sup>238</sup>

Sunrise clauses and other forms of contingent regulation might be attractive when regulators do not wish to regulate prematurely, but still want to set standards that the industry, once it becomes more developed, should be prepared to observe in the future (e.g., annual inspections of Airbnb houses or private kitchens).

Contingent legislation has been highly overlooked in the literature. This broad concept encompasses a number of different legislative and regulatory instruments. This type of legislation can refer to provisions that establish a relationship of interdependence between two provisions or bills (the so-called “tie-barring provisions” which will be explained below), or determine that a provision will only come into effect on a certain date (“commencement clause”), and often upon the verification of a certain condition (sunrise clauses). As I have explained in my previous work, both sunrise clauses and experimental regulations imply a clear delegation narrative which should determine who is competent to establish the limits of the experiment and assess the verification of the sunrise condition.<sup>239</sup>

A sunrise clause is a disposition that provides that a part of that statute or regulation will only come into effect on a specific date and will be contingent upon the verification of specific conditions.<sup>240</sup> Sunrise clauses bear a strong resemblance to contingent legislation and tie-barred provisions since these three legislative instruments share a common feature: the coming-into-effect of certain provisions is dependent on the verifica-

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<sup>236</sup> See, e.g., ARIZ. REV. STAT. ANN. §§ 32-3101 to -3106 (2008); FLA. STAT. ANN. § 455.201 (West 2007); HAW. REV. STAT. § 26H-2 (1996).

<sup>237</sup> DEAN SUGANO, LEGIS. REFERENCE BUREAU, SUNRISE REVIEWS: REGULATORY STRUCTURES AND CRITERIA, S. 121-6, 21st Sess., at vi (Haw. 2002), <http://lrbhawaii.info/lrbpts/02/sunview.pdf>.

<sup>238</sup> See AUDITOR OF THE STATE OF HAW., REP. NO. 14-14, SUNRISE ANALYSIS: REGULATION OF HERBAL THERAPISTS, A REPORT TO THE GOVERNOR AND THE LEGISLATURE OF THE STATE OF HAWAII 13 (Haw. 2014), <http://files.hawaii.gov/auditor/Reports/2014/14-14.pdf>.

<sup>239</sup> See RANCHORDÁS, *supra* note 12, at 88–100.

<sup>240</sup> See FREEMAN, *supra* note 17, at 142.

tion of a contingency. Until this contingency is verified, the dispositions lie dormant.

Tie-bar provisions are far from uncommon in the United States. These dispositions establish a relationship of strict interdependence between two bills.<sup>241</sup> Tie-barring is “the practice of placing a provision in a bill that states that it will not become effective unless and until another specified bill is also enacted into law.”<sup>242</sup> Therefore, the enactment of the first bill is contingent upon the enactment of the second one.

The constitutionality of tie-bar provisions has been challenged in state courts since a number of state constitutions have provisions limiting the number of objects to be embraced by a law. This is the case of the Michigan Constitution of 1963, which provides:

No law shall embrace more than one object, which shall be expressed in its title. No bill shall be altered or amended on its passage through either house so as to change its original purpose as determined by its total content and not alone by its title.<sup>243</sup>

The constitutional concerns with the tying of multiple bills seem to date back to the 19th century. In *People ex rel. Drake v. Mahaney*, the Michigan Supreme Court criticized a practice similar to tie-barring when the interdependence between the two bills considered was illogical:

The practice of bringing together into one bill subjects diverse in their nature, and having no necessary connection, with a view to combine in their favor the advocates of all, and thus secure the passage of several measures, no one of which could succeed upon its own merits, was one both corruptive of the legislator and dangerous to the state. . . . [T]he framers of the constitution meant to put an end . . . to legislation of the vicious character referred to, which was little less than a fraud upon the public, and to require that in every case the proposed measure should stand upon its own merits. . . .<sup>244</sup>

Under Florida law, tie-barring would not violate a constitutional prohibition on non-appropriations terms in appropriations bills as long

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<sup>241</sup> See *Glossary* [‘tie-bar’], MICH. LEGISLATURE, <http://www.legislature.mi.gov/mileg.aspx?page=glossary>. Tie-bar provisions are defined as: “A device to condition the effectiveness of legislation on the enactment or passage of other specified legislation.”

<sup>242</sup> St. of Mich., Dept. of Atty. Gen., Opinion No. 5478 (Apr. 4, 1979), <http://www.ag.state.mi.us/opinion/datafiles/1970s/op05478.htm>.

<sup>243</sup> MICH. CONST. art. IV, § 24 (1963). A similar provision can be found in the constitution of Alabama: “[E]ach law shall contain but one subject, which shall be clearly expressed in its title, except general appropriation bills, general revenue bills, and bills adopting a code, digest, or revision of statutes; and no law shall be revived, amended, or the provisions thereof extended or conferred, by reference to its title only.” ALA. CONST. art. IV, § 45. The constitution of the state of Florida has a similar disposition. See FLA. CONST. art. III, § 16.

<sup>244</sup> *People ex rel. Drake v. Mahaney*, 13 Mich. 481, 494 (1865).

as there was a reasonable relationship between the appropriation which had been tie-barred to another bill or a “direct and relative interdependence between them.”<sup>245</sup> Appropriations can thus be contingent and lie dormant until a specific bill is enacted. Sunrise clauses can be more problematic when the contingency does not rely on automatic events (e.g., a date, the enactment of alternative regulations for the taxi sector) but on more abstract phenomena that require a discretionary decision of the regulator to come into effect. This issue may raise well-documented topics on delegation in American common law.<sup>246</sup> Contingent legislation is traditionally a form of delegated legislation which confers discretion to the executive to decide on the verification of the contingency.<sup>247</sup> Automatic events or objective conditions that leave little room for discretion seem to be unproblematic and can be employed in the context of regulatory sunrise.<sup>248</sup> However, sunrise clauses should also be directly and logically dependent on the contingency or event that triggers the “sunrise.”

Sunrise clauses could be criticized on the grounds that they imply a great measure of regulatory foresight and since innovation is uncertain, regulators cannot predict the future. While this may be true, in the last decades a number of methodologies have been developed in the economics and governance literature and policy practice to facilitate regulatory foresight.<sup>249</sup> This has been visible, for example, in the development

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<sup>245</sup> *In re Op. to Governor*, 239 So. 2d 1, 9 (Fla. 1970); *see also* *Gaulden v. Kirk*, 47 So. 2d 567, 575 (Fla. 1950); *Town of San Mateo City v. State ex rel. Landis*, 158 So. 112, 114 (Fla. 1934).

<sup>246</sup> Contingent legislation was widely used in the United States in statutes concerning foreign affairs in the 19th century, accompanying the commercial wars with European nations and statutes on embargos. While in some cases Congress would leave no discretion for the Executive—more specifically, the President—to determine the contingency upon which the statute would come into effect, in others, simple power was extended in dispositions such as: “[I]t shall be lawful for the President . . . , if he shall deem it expedient and consistent with the interest of the United States, by his order, to remit and discontinue, for the time being, the restraints and prohibitions aforesaid, either with respect to the French Republic, or to any island, port or place belonging to the said Republic . . . .” Act of Feb. 9, 1799, ch. 2, § 4, 1 Stat. 613, 615; *see* JOHN PRESTON COMER, LEGISLATIVE FUNCTIONS OF NATIONAL ADMINISTRATIVE AUTHORITIES 66–67 (1927).

<sup>247</sup> Typically, this means that there is “delegat[ion of] power to determine some fact or state of things upon which the law makes, or intends to make, its own action depend.” *Field v. Clark*, 143 U.S. 649, 691, 694 (1892); *see also* *Cargo of the Brig Aurora v. United States*, 11 U.S. 382 (1813).

<sup>248</sup> *Brig Aurora* regarded the revival of an act by proclamation of the President; in *Field*, the constitutionality of broad contingent legislation was challenged. *See Brig Aurora*, 11 U.S. at 383–84; *Field*, 143 U.S. at 650–51. In *Brig Aurora*, the Court denied that the President was exercising unwarranted discretion in reviving a law, although the reasons to revive the law were not established in the statute at the time. 11 U.S. at 385.

<sup>249</sup> *See, e.g.*, Knut Blind, *Regulatory Foresight: Methodologies and Selected Applications*, 75 TECH. FORECASTING & SOC. CHANGE 496, 501, 503, 508 (2008).

of ex ante evaluations, regulatory impact assessments, and cost–benefit analyses.<sup>250</sup> By drawing on these evidence-based instruments and findings about technology, sunrise clauses can determine future requirements to be considered and fulfilled by a certain industry. In addition, sunrise clauses have been used at the state level in combination with sunset clauses; that is, after the termination of a temporary legal framework, a new one sunrises.<sup>251</sup> In this context, as more information becomes available about sharing-economy platforms, its regulation could also benefit from the use of sunrise clauses and sunrise reviews in order to delay or avoid the sunrise of unnecessary regulation.

### CONCLUSION

Nowadays our government invests significant amounts of money in R&D in order to foster innovation and economic growth. However, despite decades of research on the wealth of nations, we remain with a poor perception of *how* and *when* the state should intervene in its promotion and what exactly should be regulated.<sup>252</sup> The visible hand of the state seems to be reaching further than ever; however, in some cases this hand should do so for a limited period of time, or refrain from intervening until this becomes necessary.

In this Article, I suggest the adoption of an experimental approach to the regulation of innovative services such as sharing-economy platforms, by convincing regulators to respond to the uncertain and volatile nature of the innovation process sometimes with temporary and experimental rules, and at other times with sunrise clauses, which delay the coming-into-effect of regulation. Further research is required regarding many of the regulatory challenges listed in this Article, and namely the definition of the optimal mix of old and new regulatory instruments, particularly in the regulation of the still young, evolving, and controversial sharing economy.

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<sup>250</sup> *Id.* at 497.

<sup>251</sup> MINN. OFFICE OF THE LEGISLATIVE AUDITOR, REP. NO. 99-05, OCCUPATIONAL REGULATION 80–81 (1999), <http://www.auditor.leg.state.mn.us/ped/pedrep/9905-all.pdf>.

<sup>252</sup> Joshua D. Sarnoff, *Government Choices in Innovation Funding (with Reference to Climate Change)*, 62 EMORY L.J. 1087, 1089–91 (2013).