When Airbnb Sits in the Control Room: Platform Urbanism as Actually Existing Smart Urbanism in Reykjavík

Ola Söderström[1]* and Anne-Cécile Mermet[2]

[1] Institut de Géographie, Université de Neuchâtel, Neuchâtel, Switzerland, [2] Laboratoire Médiations, Sorbonne Université, Paris, France

Platform urbanism understood as the impact of digital platforms on the materiality, daily lives and governance of cities is, we argue in this paper, a powerful form of actually existing smart urbanism. While public attention tends to be grabbed by the control rooms and sensors of smart city narratives, the increasing density of interactions with, and transactions through, digital platforms rapidly, and profoundly reshapes the dynamics of cities and their regulation. The paper investigates platform urbanism by focusing on the "Airbnb effect" in the city of Reykjavik. Based on this case-study we argue that through their ubiquity and the control they have over code and data, platform companies increasingly tend to sit in cities' control rooms. In its conclusion, the paper calls for more studies on three issues—"datapower"; platform effects on cities; and regulatory frames—to nurture a democratic debate on this ongoing corporatization of urban governance.

Keywords: smart cities, digital platforms, urban geography, urban politics, Iceland

INTRODUCTION

At 2 PM my plane lands at Cape Town airport. A member of our research team has indicated where I will find the Uber pick-up point at the airport. In the Toyota Corolla, the typical Capetonian Uber car, I chat with the driver, Robert, about his activity as an Uber "partner" ("employee" is banned in Uber parlance). He belongs to the "pioneer generation" who started when Uber made its debut in the city in 2013. Robert has recently managed to buy the car and thus increase his revenue. He talks about the spectacular growth in the number of Uber drivers: from 1,000 in 2015 to 7,000 in 2019, he says. He complains about the increase in the Uber share of the takings for ride fares (from 20 to 25%), but at the same time says he appreciates the freedom to work when he wants to. Robert is from Congo Brazzaville and our conversation gets warmer and more upbeat when I suggest we switch to French. He drops me at the Airbnb I've booked for my 5 weeks stay in Cape Town in an area where short-term letting is very frequent. Sophie[1], the welcoming white South African landlady, shows me into the house she and her husband have bought and renovated next door to their own house in order to create additional revenue for themselves. It is in this house—part of the "Airbnb effect" on cities that this paper investigates—that one of us writes this short introductory vignette.

This account evokes some of the paradoxes and complexities of platform economies and their urban dimensions. Like many other "partners," Robert is critical of Uber's conditions while at the same time, he grabs the opportunity for the "marginal gains" (Pollio, 2019) they open up. Although

---

[1]'Robert' and 'Sophie' are both pseudonyms.

the everyday life of Uber drivers is far from living up to the promise of the company's carefully crafted "sharing economy" and "entrepreneurship for the poor" narrative, such digital platforms are reshuffling social positions and creating new and sometimes unexpected actor alliances in cities (Artioli, 2018). Sophie's investment in her neighborhood is a tiny part of the spectacular "Airbnb effect" on cities and more particularly on gentrification and the right to the city (Gant, 2016; Mermet, 2017; Wachsmuth and Weisler, 2018). What these processes suggest is that transactions and interactions through digital platforms permeate our experience of the urban everyday "driving a pronounced reconfiguration of what it means to be—and to live—in a city" (Leszczynski, 2020, 5). This mundane ubiquity of platform companies provides these companies with legitimacy and leverage in their increasing interventions in issues of urban governance (Aguilera et al., 2019). In other words, their daily use, illustrated by the introductory vignette, is the means through which "their capacity to emerge as infrastructures governing the city has been facilitated" (Barns, 2018a).

This paper develops these two points regarding the everyday effects of digital platforms on cities and on their regulatory policies. We argue that platform urbanism is a form of "actually existing smart urbanism" that reshapes the materiality, daily lives and governance of cities. This process is characterized by an uneven power balance between platform companies and local policymakers determined by the control of code and data. This emerging situation whereby platforms through this "datapower tend to sit in cities" control rooms[2] requires a democratic debate nurtured by critical studies of platform urbanism. We moor these arguments in an analysis of the "Airbnb effect" in the city of Reykjavík, Iceland.

The paper falls into three parts. The first discusses the differences and commonalities between smart urbanism and platform urbanism; then we provide a description of the significant impact of Airbnb on the housing market and right to the city in post-2008 Reykjavík. Finally, we discuss how this phenomenon has been governed by the municipality and the Icelandic state.

SMART AND PLATFORM URBANISMS

The term "platform urbanism" has recently begun to circulate in scholarly publications. In this section, we aim to draw a genealogy of this recent notion by linking it to the smart city lineage and suggesting that today platform urbanism is probably the most tangible incarnation of datapower in cities.

The idea of *smart cities* has been around since the 1990s. Urban planning was tagged for the first time with "smart" in the UN "smart growth Agenda 21' in 1992 at the Rio summit, where it was predicted that there would be about 50,000 smart cities globally by 2007. Used interchangeably with "informational" (Castells, 1996), "wired" (Dutton et al., 1987), "intelligent" (Komninos, 2002), "networked" (Graham

and Marvin, 2001), "digital" (Aurigi, 2005), or "ubiquitous" (Shin, 2009), "smart" city is the latest in a long line of urban tropes which refers to the strengthening of ICT-based systems for driving three urban elements—efficient city management, economic growth, and improved global city rankings (Saunders and Baeck, 2015). The notion of smart *urbanism* (Marvin et al., 2015) has emerged in the context of the rise of critical scholarship exploring an understanding of "smartness" beyond the "smart city" tool-kits promoted by IT corporations, in order to include questions related to the creation of new power geometries, social justice, citizenship, and everyday life. *Smart urbanism* has been defined as "a loosely connected set of confluences between data, digital technologies, and urban sites and processes" (McFarlane and Söderström, 2017, 314). Scholars have focused on different aspects of these confluences: for instance, data (Kitchin, 2014), or urban sites (Das, 2015; Datta, 2015; Odendaal, 2017). There are, of course, divergences in this critical scholarship, notably concerning how the politics of smart urbanism should be conceptualized. Should it be conceived as a Foucauldian regime of "governing through code" (Klauser et al., 2014), or rather as a broader Latourian cosmo-politics involving different political "moments" (Farías and Widmer, 2017)? To what extent is discourse central in the rolling-out of smart city policies (compare: Söderström et al., 2014; Wiig, 2016; Joss et al., 2019)? However, beyond this diversity of foci and approaches, these studies acknowledge the centrality of data-driven processes of urban and social change in any understanding or analysis of smart urbanism.

Data is also central to *platform urbanism*, an even more recent term whose definition is even more unstable. On a general level, platform urbanism refers to the ways in which digital platforms—and in particular platform enterprises like Facebook, Uber or Airbnb—reshape the economies, politics, infrastructures, and social lives of cities. Software-mediated social interactions and commercial transactions are here at center stage. But to what extent does platform urbanism differ from smart urbanism and to what extent do we need different terminologies? Beyond the obvious focus on digital platforms as empirical objects, there are three main arguments for the specificity of platform urbanism related to its materiality, its impact on everyday life and its actual effects. Firstly, specific *materialities* are engendered by or related to digital platforms (Leszczynski, 2020): Airbnb condos, Uber cars, Deliveroo bikers or huge data centers (Caprotti and Liu, 2020). These materialities differ from the sensors and control rooms (Luque and Marvin, 2020) generally associated with smart urbanism. The second specificity is related to the modes of engagement with technology in urban *everyday life*. As Barns (2018a) puts it: "Platform urbanism, enacted daily as we commute, transact, love, post, listen, tweet or chat, deeply implicates the everyday urban encounter." This quotidian and often intimate relation with technology is also partly true of the myriads of sensors or CCTV cameras associated with smart urbanism. But, while smart urban technologies are primarily extractive—they track, measure, follow things, and people—platforms are also interactive: we trace our itineraries on Google maps, "like" restaurants on

---

[2]The control room or cockpit, from where the city could be centrally managed in real-time, is an iconic feature of the smart city (Caprotti, 2019).

Facebook or order a Pizza on Deliveroo and thereby "willingly" expose our quotidian preferences and emotions (Harcourt, 2015). The third specificity combines the two previous—materiality and the quotidian—and is related to the *actual effects* of platforms on how cities work and change. If smart urbanism generally relates to how IT corporations target municipalities or nation states and how civil society organizations and citizens relate to these initiatives, digital platforms directly target individual customers and "by reaching into the pockets of urbanites, [they] express a potential for individualized influence unprecedented by "smart" infrastructure-urban configurations' (Leszczynski, 2020, 5).

Platform urbanism thus differs from smart urbanism in at least these three respects. However, the boundary is fuzzy. These terms do not refer to clearly distinct phenomena: urban data platforms or dashboards (Barns, 2018b), for instance, can be associated both with smart urbanism and platform urbanism. Therefore, in our view, platform urbanism should be considered as a "reconfiguration, diversification and intensification" (Leszczynski, 2020, 5) or as an "extension" (Caprotti and Liu, 2020) of smart urbanism which focuses on digital platforms. Furthermore, considering the observable impact of digital platforms versus how smart city promises remain mostly in the ether of utopian narrative and imagery, platform urbanism can be seen as one of the most salient forms of "actually existing smart urbanism." It is also interesting to note that recent activities by platform companies where they function as smart city entrepreneurs or planning advisors—such as Google's Sidewalk Labs in Toronto or Facebook, Twitter and others in the Seattle's Innovation Advisory Council—tend to blur the boundaries between smart urbanism and platform urbanism.[3]

In what follows, we investigate one instantiation of this actually existing smart urbanism by focusing on one type of digital platform, Airbnb, and its impacts on a specific city, the capital of Iceland, Reykjavík. Whereas, it is a less well-known case study than Barcelona, San Francisco or Berlin, Reykjavík provides an exceptional vantage point to explore the urban changes triggered by Airbnb for two reasons. First, the synchronicity between the development of Airbnb and tourism makes changes produced by short-term rental platforms particularly visible in this city (the tourism flow increased from 450,000 in 2008—when Airbnb was created—to 2 million in 2018). Second, this process occurred in the aftermath of the crisis. Platforms like Airbnb have thus been seen in Reykjavík both as a means to mitigate the consequences of the crisis, by providing households with the possibility of earning extra money, and as a new cause of tension on the housing market, allowing for a nuanced approach of the urban impact of short-term rental platforms.

We focus first on the Airbnb effect on the city's housing market and, second, on the conflicts and resistance around regulatory policies in the Icelandic capital.

---

[3]Many thanks to one of the reviewers for pointing this out.

PLATFORM URBANISM AT WORK: HOW AIRBNB INCONSPICUOUSLY RESHAPES THE PRODUCTION OF URBAN SPACE IN REYKJAVÍK

Airbnb is considered as one of the main actors of platform capitalism (Srnicek, 2017). While the activity on which this platform is based—home-stay—has long existed without making the headlines, its digital character has turned this practice into a major political issue in most contemporary metropolises. Based on a very user-friendly interface and on an algorithm crafted to maximize peer-to-peer digital intermediation, Airbnb allows very easy connections between tourists scattered worldwide who are planning to visit a city with other persons happening to have an (presumably) under-utilized real estate asset at this specific time and in this place who would never otherwise have met (van der Aalst et al., 2019). Thus, despite the fact that Airbnb does not supply anything physical, it provides local inhabitants with the opportunity to turn their residences into tourist accommodation, by simply devoting a few minutes creating an online profile and listing.

With 4,000 listings representing 20% of the housing of the central districts of the city (Mermet, 2019) (see **Figure 1**), Reykjavík perfectly illustrates how making home-stay digital has reshaped the urban fabric: its materiality, everyday life and socio-economic dynamics.

(1) Materiality. Short-term rental digital platforms have been crucial dimensions and facilitators of the massive tourism boom that the city has witnessed over the past decade. Digital intermediation has provided tourists with a direct access to a large collection of local homes and, for locals, has opened a new way to earn income through the commodification of their home. This has triggered major changes in the material production of the city by blurring the lines between housing and tourism accommodation (Stabrowski, 2017).

(2) Everyday Life. Furthermore, like other cities where analyses have been done (Adamiak, 2018; Wachsmuth and Weisler, 2018), Airbnb supply is highly concentrated in the central district, with significant effects on the everyday life of these neighborhoods. There have been dramatic changes in streets where 70% of the houses are listed on the platform: the local sense of place is affected by differences in the rhythm of life between locals and tourists, the retail structure is modified and the demographic features of the neighborhood are altered: for example, local schools have faced class closures due to the replacement of families by tourists in the residential buildings of the area.

(3) Socio-economic dynamics. The "platformisation" of home-stay has thus turned what used to be a marginal and alternative practice (home-stay) into a new segment of the housing market (short-term rentals). As a consequence, there are two types of rental markets running in parallel (long and short term rentals), creating a new form of rent gap (Smith, 1979) disrupting the local dynamics of the housing market. Thus, in 2018, the average rental price for a two room apartment in the center of Reykjavík was 1300€ a month, while a landlord could
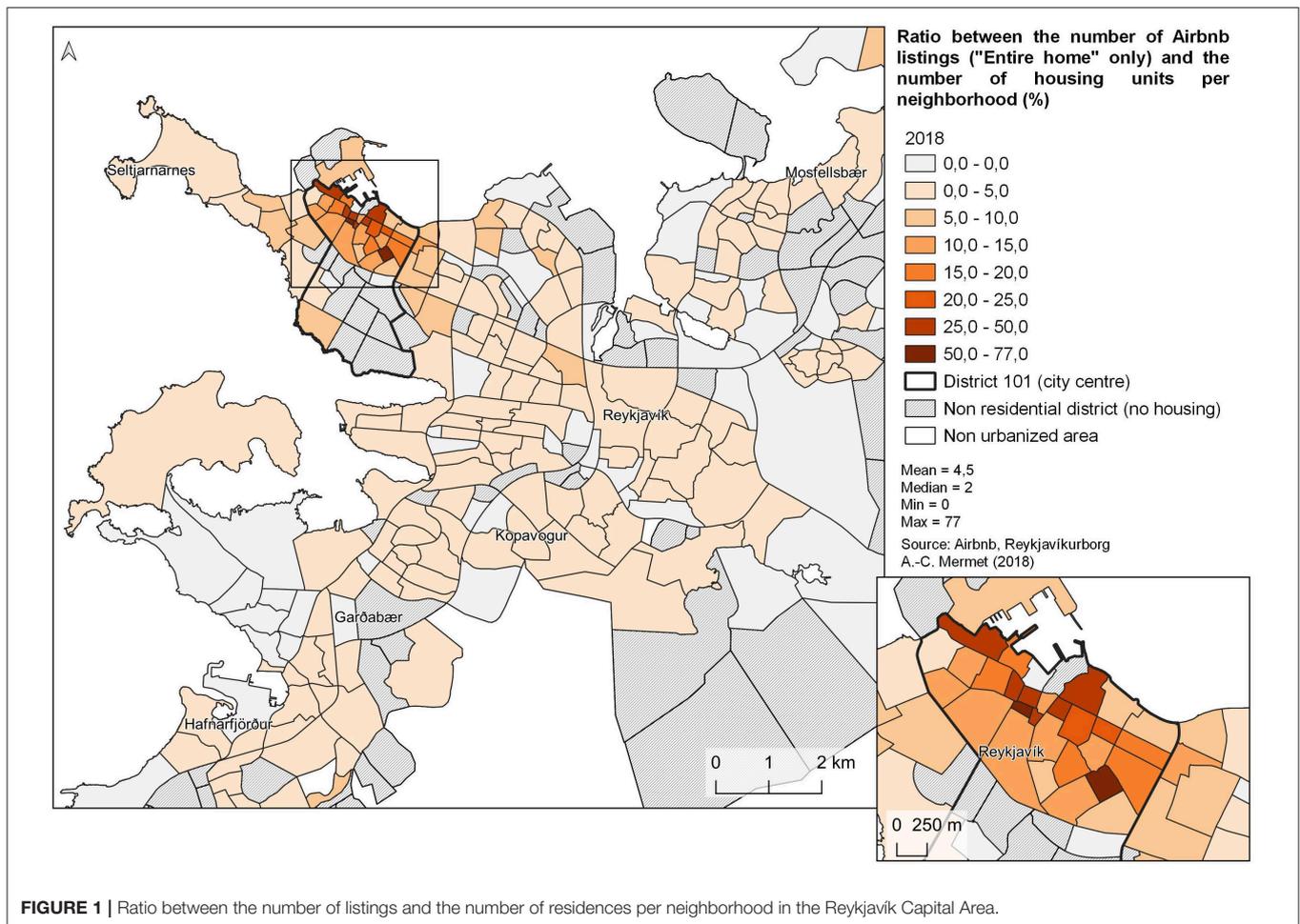
FIGURE 1 | Ratio between the number of listings and the number of residences per neighborhood in the Reykjavík Capital Area.

expect to earn around 4500€ by letting it out on Airbnb during the same period (Mermet, 2019; **Figure 2**).

As demonstrated for other cities like Boston, New York or Palma de Majorca (Horn and Merante, 2017; Wachsmuth and Weisler, 2018; Yrigoy, 2019), such a rent gap increases the pressure on rents (Mermet, 2017) and has contributed to the inflation of real estate values (Elíasson and Ragnarsson, 2018). Short-term rental platforms have opened a new and very profitable window of "buy-to-let" investments (Cocola-Gant and Gago, 2019) for locals who have the means to invest in this market, but also for investment companies. At the other end of the spectrum, it becomes more difficult for people to enter the housing market. Students, young households, migrants who, by definition, do not have the possibility of participating in this platform business, are finding it increasingly unaffordable to find a place to live, triggering evictions or forms of temporary displacement in cities like Barcelona (Cócola Gant, 2018) or Lisbon (Cocola-Gant and Gago, 2019). In Reykjavík, landlords have developed new forms of leases that only run from October to April, in order to let out places on Airbnb during the peak tourist season.

Thus, while the development of this form of platform urbanism occurred separately from the smart city political agenda[4], its increasing pervasiveness is inconspicuously but deeply reshaping the way contemporary cities work and change by reshuffling the cards of the intermediation game, and "smartly" bypassing the existing regulatory frameworks that have been crafted for the "physical" and not for the virtual world.

GOVERNING PLATFORM URBANISM: THE POWER OF CODE AND DATA CONTROL

Local governments have quickly realized that platform urbanism is challenging their ways of thinking about, producing and regulating urban space (Ferreri and Sanyal, 2018). Filling a loophole somewhere between housing and tourism regulation, platform-mediated accommodations are characterized by: significant *flexibility* (the digital makes it very easy to open, close down, and reopen a listing); *opacity* (it is very difficult to match an actual physical person/apartment with a virtual online profile/listing); and *informality* (the tourist use of residential

---

[4]Reykjavík is actively unfolding its smart agenda with a focus on the development of optic fiber networks and the Internet of Things in partnership with Cisco, and with Siemens, on transportation. See: http://verkefni.snjallborgin.is/ (last accessed: December 2019).
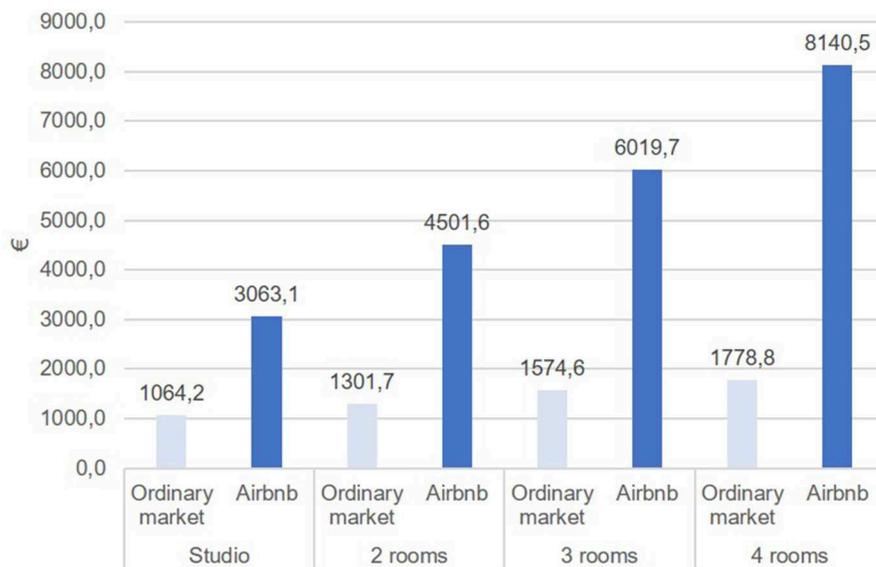
FIGURE 2 | Monthly rental prices for apartments in central Reykjavík. Source: Airbnb, Registers Iceland, 2018.

units does not fit any existing legal framework). Facing this *fait accompli*, cities have to adjust their planning, tax and legal frameworks to the realities imposed by platform urbanism.

The difficulties that cities such as Barcelona, Paris, Berlin or New York are experiencing in implementing efficient regulation (Ferreri and Sanyal, 2018; Aguilera et al., 2019) are a very significant indicators of the power imbalance between local policymakers and platforms that are often based abroad and take advantage of a monopolistic position (Faravelon et al., 2016; van der Aalst et al., 2019). Cities crucially depend on the goodwill of platforms in order to successfully enforce their regulation on at least three levels: the identification of Airbnb hosts, the limitation of rental periods, the taxation of hosts. First, to be efficient, these regulations need to be integrated into the code used by the platform. For instance, like many other cities, Reykjavík has tried to implement a registration number that would allow the tax administration to match a listing on Airbnb with a physical person. Yet, the platform algorithm is programmed to hide everything that looks like a series of numbers. Therefore, platforms need to support these regulations by creating an *ad hoc* field in their forms so that hosts can actually display their registration number. Second, most cities have also tried to set a maximum number of nights per year a host can let out a home on platforms (90 in the case of Reykjavík). Yet, without the implementation of a suspension system by the platform, this limitation is very difficult to enforce and very easy to circumvent. Third, taxing the income earned by hosts from their activity on short-term rental platforms requires platforms to send disaggregated data to local tax authorities in order to let them know who rents what and how often. In Reykjavík and in other cities like Paris that have reached an agreement regarding the payment of tourist tax by platforms, Airbnb transfers an arbitrary amount of money without any disaggregated data that would

allow local authorities to check if this amount corresponds to the actual due tax.

Most tourism cities are trying to engage with Airbnb to implement such new rules in a more or less conflictual manner. While Paris and Barcelona have taken a hard line on the matter by fining or suing the platforms, Amsterdam reached an agreement with Airbnb in November 2016 for a two year experimental collaboration (2017–2018)[5] involving data sharing, the implementation of regulation by the platform and even the automatic suspension of listings "that appear not to comply to these goals"[6]. But the city failed to renew this agreement in 2019 after the reduction of the quota to 30 days a year. The framing of digitally-mediated short-term rentals takes a specific form in Reykjavík: unlike Paris, Barcelona or Milan (Aguilera et al., 2019) where the impetus for regulation was initiated at the city level, in Iceland the national government first took the lead on the matter by voting the law implementing the 90 days quota. Local authorities (supported by the hotel industry[7]) are now increasingly active on this front: in 2018, they opened on-going negotiations with Airbnb with the aim of reaching a similar agreement to the one signed in Amsterdam. The difficulties of regulating platform urbanism in Reykjavík and elsewhere show that digital platforms, through their ubiquity and the control they have over code and data, produce a corporatisation of governance in which platform companies are increasingly in control.

---

[5]See https://news.airbnb.com/airbnb-and-amsterdam/ and https://www.amsterdam.nl/nieuwsarchief/persberichten/2016/persberichten-1/amsterdam-and-airbnb/ (last checked: November 2019).
[6]Source: contract signed between Airbnb and Amsterdam in 2016.
[7]It is worth noting that, contrary to many other cases, resident associations' actions against tourism in Reykjavík have primarily targeted the building new hotels, rather than platforms which are seen as a way of redistributing tourism income to locals.

CONCLUSION: POLITICIZING "DATAPOWER"

While the wireless sensor networks and control room vendors of smart cities tend to speak primarily to municipal officials and politicians, platforms have spoken directly to city-dwellers, providing them with seductive and ergonomic digital tools that revolutionize and maximize social interaction—which is arguably the very *raison d'être* of cities (Taylor, 2012). In this paper, we have shown how the use of digital platforms permeates the urban fabric and daily life, unobtrusively actualizing the advent of a data-driven city. While scholars and policymakers have long focused on less mundane facets of the digital revolution, actually existing smart urbanism is probably to be found first and foremost in the way platforms such as Airbnb, Uber, Deliveroo and the like are reshaping contemporary cities.

Therefore, there is urgent need for research on the regulation of platform urbanism. In our case-study, we have shown that the Airbnb effect hinges on two phenomena: "datapower" and politicization. "Datapower"—i.e., control of data flows—is related to the everyday commerce of data between the platform and its users where data and code are controlled by the platform. This is far from the "cockpit" or "control room" vision of smart-cities-in-a-box where municipalities are in the pilot seat. Rather, municipalities try to obtain data they do not control and this lack of control, the fact of being outside the game, makes public regulation very difficult. The second parameter in the regulation of platform urbanism is its politicization. Constructing platform urbanism as a public and political problem can be a bottom-up process driven by citizen groups, or it can be a top-down process, driven by the state (Aguilera et al., 2019). It is also a domain in which platform companies themselves are active, in particular by attempting to enroll their users against the regulation of their activities (Ferreri and Sanyal, 2018).

Further research in urban studies should contribute to a democratic debate on platform urbanism. Such a contribution should have at least three foci: the first is a reflection on "datapower," the second is the unfolding of the issues at stake and the third is comparison.

Datapower in the urban should be understood as part of wider data politics concerned with "how data is generative of new forms of power relations and politics at different and interconnected scales" (Ruppert et al., 2017, 2). Thus, the analysis of datapower in platform urbanism cannot be extracted from processes such as the transnational operations and the national regulations of digital platforms and raises questions such as: How does the control of data and code transform the power geometry of urban politics, notably between platform companies and the State? How do individuals contribute to a new regime of practice-, emotion-, and opinion-related urban data? How are these data shaping new ambivalent subjectivities, i.e., depending on our positionings (as inhabitants, tourists, homeowners)?

Necessary critical analyses of issues related to platform urbanism include gentrification, the right to the city, the right to data (Gabrys, 2019) or surveillance. Important here, in our view, is to avoid simply placating well-known critical arguments in urban studies, by paying attention to its specificity: observing for instance the marginal gains of Uber drivers (Pollio, 2019) or Airbnb earnings as allowing tenants *not* to be evicted in times of economic crisis (Mermet, 2017).

Finally, the development of translocal comparisons will provide important knowledge on how these issues and urban power geometries differ spatially in their expressions. Variation-finding between (at least seemingly) similar cases (for instance: Barcelona, Amsterdam, Berlin) or (at least seemingly) most different cases (for instance: Mumbai, Cape Town, Reykjavík) are needed to unravel the variegated geographies and politics of platform urbanism.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

AUTHOR CONTRIBUTIONS

The paper has been co-written by both authors. OS has provided the argumentative structure of the paper and more specifically written the first two sections and the conclusion. A-CM has done the empirical work in Reykjavìk and more specifically written sections 3 and 4.

FUNDING

ACKNOWLEDGMENTS

REFERENCES

Adamiak, C. (2018). Mapping Airbnb supply in European cities. *Ann. Tour. Res.* 71, 67–71. doi: 10.1016/j.annals.2018.02.008

Aguilera, T., Artioli, F., and Colomb, C. (2019). Explaining the diversity of policy responses to platform-mediated short-term rentals in European cities: a comparison of Barcelona, Paris and Milan. *Environ. Plan.* 1–24. doi: 10.1177/0308518X19862286

Artioli, F. (2018). Digital platforms and cities: a literature review for urban research. *Cities are back in town Working Paper*. Available online at: http://blogs.sciences-po.fr/recherche-villes/ (accessed June 1, 2020).

Aurigi, A. (2005). *Making the Digital City: The Early Shaping of Urban Internet Space*. (Aldershot: Ashgate).

Barns, S. (2018a). *We are all Platform Urbanists now*. Available online at: https://www.mediapolisjournal.com/2018/10/we-are-all-platform-urbanists-now/ (accessed 10.11.2019).

Barns, S. (2018b). Smart cities and urban data platforms: designing interfaces for smart governance. *City Culture Soc.* 12, 5–12. doi: 10.1016/j.ccs.2017.09.006

Caprotti, F. (2019). Spaces of visibility in the smart city: Flagship urban spaces and the smart urban imaginary. *Urban Studies,* 56, 2465–2479. doi: 10.1177/0042098018798597

Caprotti, F., and Liu, D. (2020). Emerging platform urbanism in China: reconfigurations of data, citizenship and materialities. *Technol. Forecast. Soc. Change.* 151. doi: 10.1016/j.techfore.2019.06.016

Castells, M. (1996). *The Rise of the Network Society: The Information Age: Economy, Society, and Culture.* (Chichester: Wiley-Blackwell).

Cócola Gant, A. (2018). Struggling with the leisure class: Tourism, gentrification and displacement (Doctoral dissertation). Cardiff: Cardiff University. 256.

Cocola-Gant, A., and Gago, A. (2019). Airbnb, buy-to-let investment and tourism-driven displacement: a case study in Lisbon. *Environ. Plan.* doi: 10.1177/0308518X19869012

Das, D. (2015). Hyderabad: visioning, restructuring and making of a high-tech city. *Cities* 43, 48–58. doi: 10.1016/j.cities.2014.11.008

Datta, A. (2015). New urban utopias of postcolonial India 'Entrepreneurial urbanization'in Dholera smart city, Gujarat. *Dialogues Hum. Geogr.* 5, 3–22. doi: 10.1177/2043820614565748

Dutton, W. H., Kraemer, K. L., and Blumler, J. G. (1987). *Wired Cities: Shaping the Future of Communications.* (Indianapolis: Macmillan).

Elíasson, L., and Ragnarsson, Ö. P. (2018). *Short-Term Renting of Residential Apartments. Effects of Airbnb in the Icelandic Housing Market.* (Reykjavík: Central Bank of Iceland).

Faravelon, A., Frénot, S., and Grumbach, S. (2016). Chasing data in the Intermediation Era: Economy and Security at stakes. *IEEE Secur. Priv. Magazine* 14, 22–31. doi: 10.1109/MSP.2016.50

Farías, I., and Widmer, S. (2017). Ordinary smart cities; how calculated users, professional citizens, technology companies and city administrations engage in a more-than-digital politics. *Tecnoscienza* 8, 43–60.

Ferreri, M., and Sanyal, R. (2018). Platform economies and urban planning: airbnb and regulated deregulation in London. *Urban Studies* 55, 3353–3368. doi: 10.1177/0042098017751982

Gabrys, J. (2019). "Data citizens: how to reinvent rights, in *Data Politics. Worlds, subjects, rights,* eds. D. Bigo, E. Isin and E. Ruppert (London: Routledge), 248–266

Gant, A. C. (2016). Holiday rentals: the new gentrification battlefront. *Sociol. Res. Online* 21, 1–9. doi: 10.5153/sro.4071

Graham, S., and Marvin, S. (2001). *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition.* (London: Routledge).

Harcourt, B. E. (2015). *Exposed: Desire and Disobedience in the Digital Age.* (Cambridge Mass: Harvard University Press).

Horn, K., and Merante, M. (2017). Is home sharing driving up rents? Evidence from Airbnb in Boston. *J. Hous. Econ.* 38, 14–24. doi: 10.1016/j.jhe.2017.08.002

Joss, S., Sengers, F., Schraven, D., Caprotti, F., and Dayot, Y. (2019). The smart city as global discourse: Storylines and critical junctures across 27 cities. *J. Urban Technol.* 26, 3–34. doi: 10.1080/10630732.2018.1558387

Kitchin, R. (2014). The Real-Time City? Big Data and Smart Urbanism. *GeoJournal* 79, 1–14. doi: 10.1007/s10708-013-9516-8

Klauser, F., Paasche, T., and Söderström, O. (2014). Michel Foucault and the smart city: power dynamics inherent in contemporary governing through code. *Environ. Plan. D* 32, 869–885. doi: 10.1068/d13041p

Komninos, N. (2002). *Intelligent Cities: Innovation, Knowledge Systems, and Digital Spaces.* (London: Routledge).

Leszczynski, A. (2020). Glitchy vignettes of platform urbanism. *Environ. Plan. D.* 38, 189–208. doi: 10.1177/0263775819878721

Luque, A., Marvin, S. (2020). *Control Room: Nodes in the Networked City.* (London: Routledge).

Marvin, S., Luque-Ayala, A., and McFarlane, C. (2015). *Smart Urbanism: Utopian Vision Or False Dawn?* (London: Routledge). doi: 10.4324/9781315730554

McFarlane, C., and Söderström, O. (2017). On alternative smart cities: from a technology-intensive to a knowledge-intensive smart urbanism. *City* 21, 312–328. doi: 10.1080/13604813.2017.1327166

Mermet, A.-C. (2017). "Airbnb and tourism gentrification: critical insights from the exploratory analysis of the 'Airbnb syndrome'in Reykjavik," in *Tourism and Gentrification in Contemporary Metropolises,* eds. M. Gravari-Barbas and S. Guinand (London: Routledge), 52–74.

Mermet, A.-C. (2019). *The 'Airbnbfication' of the Icelandic Capital. Towards an Assessment of the Socio-Spatial Impacts of Airbnb in the Reykjavik Capital Area in Ferð*amálarannsóknir* (Reykjavik: Tourism Research in Iceland), 103.

Odendaal, N. (2017). "Getting Smart about Smart Cities in Cape Town: Beyond the Rhetoric," in *Smart Urbanism. Utopian Vision or False Dawn?,* eds. S. Marvin, A. Luque-Ayala and C. McFarlane (London: Routledge), 71–87.

Pollio, A. (2019). Forefronts of the sharing economy: uber in cape town. *Int. J. Urban Reg. Res.* 43, 760–775. doi: 10.1111/1468-2427.12788

Ruppert, E., Isin, E., and Bigo, D. (2017). Data politics. *Big Data Soc.* 4, 1–7. doi: 10.1177/2053951717717749

Saunders, T., and Baeck, P. (2015). *Rethinking Smart Cities From the Ground Up.* (London: Nesta).

Shin, D.-H. (2009). Ubiquitous city: Urban technologies, urban infrastructure and urban informatics. *J. Inform. Sci.* 35, 515–526. doi: 10.1177/0165551509100832

Smith, N. (1979). Toward a theory of gentrification a back to the city movement by capital, not people. *J. Am. Plan. Assoc.* 45, 538–548. doi: 10.1080/01944367908977002

Söderström, O., Klauser, F., and Paasche, T. (2014). Smart cities as corporate storytelling *City* 18, 307–320. doi: 10.1080/13604813.2014.906716

Srnicek, N. (2017). *Platform Capitalism.* (Oxford: Polity Press).

Stabrowski, F. (2017). 'People as businesses': Airbnb and urban micro-entrepreneurialism in New York City. *Cambridge J. Regions Econ. Soc.* 10, 327–347. doi: 10.1093/cjres/rsx004

Taylor, P. J. (2012). Extraordinary cities: early 'city-ness' and the origins of agriculture and states. *Int. J. Urban Reg. Res.* 36, 415–447. doi: 10.1111/j.1468-2427.2011.01101.x

van der Aalst, W., Hinz, O., and Weinhardt, C. (2019). Big digital platforms. *Business Inform. Systems Eng.* 61, 645–648. doi: 10.1007/s12599-019-00618-y

Wachsmuth, D., and Weisler, A. (2018). Airbnb and the rent gap: Gentrification through the sharing economy. *Environ. Plan. A* 50, 1147–1170. doi: 10.1177/0308518X18778038

Wiig, A. (2016). The empty rhetoric of the smart city: from digital inclusion to economic promotion in Philadelphia. *Urban Geogr.* 37, 535–553. doi: 10.1080/02723638.2015.1065686

Yrigoy, I. (2019). Rent gap reloaded: Airbnb and the shift from residential to touristic rental housing in the Palma Old Quarter in Mallorca, Spain. *Urban Stud.* 56, 2709–2726. doi: 10.1177/0042098018803261