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PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION: CHARACTERIZATION AND IMPLICATIONS

(PhD Dissertation)

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Realizada bajo la tutorización de SALVADOR PÉREZ MORENO y dirección de ELENA BÁRCENA MARTÍN Y SALVADOR PÉREZ MORENO

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POLITICAL ECONOMY or ECONOMICS is a study of mankind in the ordinary business of life

Alfred Marshall

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I. INTRODUCTION

I.1. Background

My research on the analysis of the peer-to-peer (p2p) market for tourist accommodation started while I studied the *Master in Economics and Finance* in CEMFI (2015-2017). As usual, the syllabus required the development of a thesis to complete the master. After various conversations with Prof. Caterina Calsamiglia, the idea of analyzing said market arose. Back then, it was obvious that the development of p2p markets was making it easier for agents to perform their own strategies, at an individual level, to reach goals subject to their particular preferences and restrictions. In such a context, a series of platforms that allow transactions between individuals have emerged and developed, taking advantage of the benefits provided by the internet so that any kind of supply and demand can meet. On the one hand, many of the costs (information and search costs, for example) that traditionally prevented transactions have been drastically reduced. On the other hand, the height of the entry barriers that existed in certain markets has decreased significantly so that the scale of production or access to distribution channels are no longer insurmountable requirements for new entrants and, consequently, it is much easier for individual sellers to compete with established companies. As a consequence, many of the problems traditionally faced by economic analysis (price formation, asymmetric information, market structure, consumer choice, etc.) have been reconsidered to the point where contributions on these issues have been, in recent years, one of the most active areas in the field of industrial organization (Levin, 2013).

Among the different research possibilities, we agreed that the analysis of the p2p market for tourism was especially attractive, not only for its importance of tourism in terms of employment and production that it has globally acquired. Particularly, I was interested in exploiting the potential of the skills that I had developed in the master, both in economic analysis as in econometrics—more concretely, microeconometric. It is clear that there is a pre-existing body of knowledge that testifies the pertinence of applying rigorous methods to the analysis of tourism, as proven by the works of an extensive group of researchers whose contributions are published in renowned academic journals. But, at the same time, a literature review confirms that from an economic perspective, contributions about the functioning of the p2p market for tourist accommodation are relatively scarce, in comparison to those that were being generated from the point of view of other social approaches; some of them even lacking a rigorous analytical framework. In sum, we saw a road to take here that could potentially expand the frontier of knowledge.

In a very intellectually stimulating environment, I completed my master thesis thanks to the support of my advisor, Prof. Caterina Calsamiglia, and to the comments and suggestions by other members of the CEMFI faculty such as professors Manuel Arellano and Guillermo Caruana. The final title of my thesis was the following: *Price and booking determinants in the peer-to-peer market of tourist accommodation. The case for Airbnb in Barcelona*. Basically, the main goal of my thesis was to formulate a comprehensive and accurate equilibrium pricing equation that is able, on the one hand, to describe the pricing dynamics of existing accommodations, and, on the other, to suggest realistic prices for out-of-sample accommodations.

After finishing the master, I moved to *University College of London* during the year 2017-2018, where besides attending their Economics MRes courses, I kept exploring and maturing some of the ideas that had occurred to me over the course of my research on the peer-to-peer market for tourist accommodation. I wrote a couple of papers that were eventually accepted for publication in leading journals, which to me confirmed the line of research that I had begun and its results were considered relevant to the scientific community. In particular, the articles that got published were the following:

- Benítez-Aurioles, B. (2018a). Why are flexible booking policies priced negatively? *Tourism Management*, 67, 312-325. This work suggests a new direction to look at when explaining seemingly counterintuitive findings. Using data from 497,509 Airbnb listings in 44 cities of the world, we confirm a negative relationship in the peer-to-peer tourist accommodation market between flexible cancellation policies and nightly price, as well as between the possibility of instant booking and price. This phenomenon had been hypothesized to be caused by emotional factors that would go in the opposite direction to the monetary incentives. However, the economic analysis presented in this paper reinforces the idea that the functioning of these types of markets and, in particular, the vectors that determine supply are not very different from those that govern traditional markets.
- Benítez-Aurioles, B. (2018b). The role of distance in the peer-to-peer market for tourist accommodation. *Tourism Economics*, 24(3), 237-250. This article provides evidence on the concentration of peer-to-peer tourist accommodations in the center of cities and the role of distance. On that basis, an explanatory model is

proposed to understand the locating decisions of the different agents involved. The model is empirically implemented through a two-stage least squares regression, which allows estimating the elasticity of demand with respect to price and distance. Results for the Spanish cities of Barcelona and Madrid confirm similar price elasticity of demand in both (2.2 and 2.4, respectively) but greater sensitivity of demand with respect to distance to the center in the former.

Later, in the academic year 2018-2019, I joined the PhD Program in Economics and Business of the University of Malaga. Professors Elena Bárcena Martín and Salvador Pérez Moreno accepted to supervise my doctoral thesis. This stage was pivotal to the growth of my scientific productivity. Thanks to their help, stimulus and cooperation, several papers were developed and matured, and eventually completed, that despite their various aims still revolved around the p2p market for tourist accommodation. The majority of them are part of the content that makes up my doctoral thesis. At this point, I shall also mention Prof. Iis Tussyadiah, who, during my stay in the University of Surrey between October 2019 and January 2020, knew how to guide and help me out with my work.

I.2. From the sharing economy to the peer to peer market for tourist accommodation

The so-called *sharing economy* and other similar concepts such as *collaborative consumption* started to gain protagonism since the work of Botsman and Roger (2010). Soon it became a widely utilized term, not just in the media (The Economist, 2013) but also by international organisms such as the OECD (2015). In parallel, contributions began to proliferate at an academic level from different areas—specifically social sciences. In this way, the analysis of the sharing economy started to advance in a fragmented manner and with no consensus on what its content or definition is (Codagnone & Martens, 2016), which justified the first attempts to sort the ideas that were being generated. Belk (2014) made the difference between sharing and pseudo-sharing. The latter would be a wolf-in-sheep's-clothing phenomenon, characterized by: the presence of profit motives; the absence of feelings of community; and expectations of reciprocity. Schor (2016), after stating that it is almost impossible to reach a solid definition, differentiates four broad categories of activities within the sharing economy: recirculation of goods, increased utilization of durable assets, exchange of services, and sharing of productive assets.

Within this framework, Internet platforms that create “markets in sharing” are born, by facilitating exchanges that can be classified by type of provider (peer to peer vs. business to peer) and platform orientation (non-profit vs. for-profit). He explicitly refers to Airbnb as peer-to-peer for profit.

More recently, Muñoz and Cohen (2017) noted that the greater part of research on the sharing economy had been conceptual or based on isolated cases. They used the fuzzy-set qualitative comparative analysis (fsQCA) to evaluate the business model of 36 firms in the sharing economy. On that basis, they identified the following features of the sharing economy: platform for collaboration; under-utilized resources; peer-to-peer interaction; collaborative governance; mission-driven; alternative funding; and leverage on technology. Being 'mission-driven' refers specifically to the emphasis on non-pecuniary rewards and logical alternatives to value-creation. That is, profit intention was starting to be set as a criterion to identify what does not belong to the sharing economy.

Many initiatives of the sharing economy that were originally non-profit have began to lose relevance in favor of those that are based on a business model where the platform charges a fee for each exchange. In fact, in the last few years, the academic interest for the sharing economy has started to dwindle. For instance, the number of references between 2010 and 2014 that come up in Google Scholar when searching for publications related to the sharing economy is of approximately 700 thousand, while between 2015 and 2019, they barely exceed 400 thousand. Instead, the attention has shifted to particular firms of the sharing economy, like Airbnb and Uber.

In such a context, activities related to tourism have been a fruitful field for experience and growth for residents to share their homes, cars, meals, or even knowledge on the tourist attractions of their area (Cheng, 2016). This landscape raised debates surrounding new questions, opening up a number of possibilities for research in the area of social sciences. Soon, evidence started to pile up that confirmed from a sociological or psychological point of view that agents who take part in the p2p market for tourist accommodation do so for emotional and economic factors. Once we accept this reality surrounding the definition of the sharing economy, at least in certain markets, these kinds of works started to lose protagonism in front of others on the new mechanisms for search and matching, pricing, and reputation (Einav *et al.*, 2016). Specifically, certain questions arose academic interest. In the first place, although the reduction in information costs has

allowed p2p markets to visibly increase the number of matches between suppliers and demanders, still, there are costs that make the way in which supply is presented a factor in explaining consumer decisions. At the same time, it is harder to fight discrimination by race, religion, sex, etc.

Secondly, concerning price formation, a shallow analysis could conclude that the proliferation of digital markets could bring us closer to perfect competition, with numerous atomic suppliers and demanders that have access to perfect information. In reality, instead, we have non-homogeneous products and information and transaction costs. Therefore, the functioning of digital markets does not guarantee efficient price formation.

Lastly, mechanisms to establish the reputation of participants in Internet markets have exhibited some weaknesses that raise concerns about, for instance, the authenticity of reviews and their capacity to rightfully guide decisions—especially that of potential customers.

Ultimately, there are currently many open lines of research that have already borne fruit and have allowed us to better understand the functioning of the market, the motivations of participating agents, the variables determining them and the effects that they are causing; but there is still much more to discover. The various research projects that are under way promise to push back the boundaries of our knowledge. In this connection, we notice that it is possible to raise interesting questions whose answer can be addressed with the basic tools of economic analysis.

I.3. Research questions and structure of the thesis

The starting hypothesis is that the p2p market for accommodation does not work too differently from standard markets. Hence, conventional economic analysis is suitable for models, explanations and predictions, i.e. we will assume utility maximization in our reasoning. This proves convenient for mathematical analysis and quantification, but also captures a crucial aspect of the pseudo-sharing economy: the profit motive. That is, we start from the view that economic analysis, among other of its principles, assumes that individuals respond to incentives and base their decisions on cost and benefit

comparisons, is an adequate tool to characterize this market; to understand and value its effects; and to design economic policy measures responding to social preferences.

Besides that, the generic objective that we set out when I formally started my doctoral thesis was to enhance the knowledge available in this area of research. We wanted to avoid the temptation to simply replicate previous studies with new data. In this vein, the basic criterion that has guided our work is the search of novel elements: to deliver ideas, arguments, pieces of evidence, etc. that had not been brought forward before. Naturally, this makes an exhaustive review of the literature compulsory, to know what is already known about the p2p market for tourist accommodation, since by then no comprehensive work compiling and ordering contributions of this subject had been made. Without being aware of it, other researchers were following the same steps. Consequently, once I finished my first version of a survey, other literature reviews appeared: Dann *et al.*, 2019; Dolnicar, 2019; Guttentag, 2019; Prayag and Ozanne, 2018. All of them—including mine—expressed similar ideas through different approaches and with unique elements. Once I learned about this work, we focused on underlining the novelty of our analysis by proposing a series of stylized facts, given how many regularities had been found in the p2p market for tourist accommodation—which is something that had not been done. The final outcome is presented in Chapter II. Its contents try to respond to the following question: what have we learned about the p2p market for tourist accommodation? Thus, it defines the state of knowledge on which our research builds up.

The next step was *to identify recent trends that are configuring the p2p market for tourist accommodation.* Overall, chapter III executes a descriptive analysis of the most recent data to confirm tendencies or detect changes to know whether our proposed hypotheses are pertinent. Data comes from scrapings of active listings in the Airbnb platform in early 2016 and 2019, in 10 cities of the world. On that basis, we observe, among other things: the growth of the market, the predominance of entire homes, the professionalization of hosts, and a booking policy in which flexible cancellation loses weight and instant booking gains protagonism. In light of these facts, we raised two questions.

The first was: *Why the percentage of hosts that activate the instant booking option is growing?* Chapter IV proposes an explanation. Given that a significant reason for the concentration of demand in a subset of the supply in the p2p market for tourist accommodation is herding behavior, by which the decisions of the first guests are imitated

by those who follow, a cumulative behavior would be generated concerning the bookings of certain accommodations, while others would barely be demanded. How could hosts then avoid the vicious circle through which their accommodations are not demanded because they have not been occupied before? The key to that is in our profit- and utility-maximization microeconomic model, implemented with data of Airbnb listings corresponding to 10 European cities, which demonstrates that the instant booking option raises the possibility of getting that initial push to increase demand subsequently.

The second question is related to the growing presence of professional hosts; that is, hosts who offer more than one accommodation. In the literature review, we found a number of works that relate price to accommodation's features, amenities, location, host characteristics or the booking policy, but none on the effects of supply concentration on prices. *Does supply concentration influences prices in the p2p market for tourist accommodation?* The fruits of our effort to answer that can be found in Chapter V. In it, we propose a model that we implement with data on 68 world cities, to prove to what extent the concentration of supply, at both individual and market levels, explains prices.

Other questions that we pose are not new but the results of research up to now have not found a definitive answer, nor was it our intention. The objective is to contribute evidence and ideas to enrich the debate. Hence, Chapter VI is entitled *Is Airbnb bad for hotels?* There we bring forward some evidence referred to the city of Barcelona on the impact that the growth of Airbnb is having on the economic performance of established incumbents (hotels). We also ask ourselves: *What are the impacts of Airbnb in the real estate market*? For that, in Chapter VII, using data from the city of London, we determine to what extent the development of the p2p market for tourist accommodation affected rental and purchase housing prices. The same subject is tackled in Chapter VIII with data from Barcelona and a different technique. Moreover, a model is added on which we base a proposal to regulate p2p accommodation that intends, in practice, to get closer to the socially optimal level of implementation.

Besides that, the collision of certain events in Barcelona during the last quarter of 2017 became an opportunity to learn *how the p2p market for tourist accommodation works* and, more concretely, *how they adapt to external shocks*. We devote Chapter IX to this issue, where we can find some arguments to answer the questions: *Are prices flexible in the p2p market for tourist accommodation? What about adjustments? Are they fast or slow?*

Another topic that we sought to explore is that of one of the problems that is frequently associated to tourism: seasonality. *Has the expansion of the p2p market for tourist accommodation contributed to soften the pattern of tourist demand, or on the contrary, has it accentuated it?* In Chapter X, we analyze the case of the island of Mallorca, as a typical example of mature destination geared towards sun and beach tourism, to confront the hypothesis that seasonality in the p2p market for tourist accommodation is smaller than that existing in conventional markets.

The two last chapters before conclusions delve into the functioning of the peer-to-peer market for tourist accommodation in concrete environments. Chapter XI focuses on the cases of Mallorca and Menorca to evaluate *what the impacts of the p2p market are in destinations that have a different degree of maturity*. For its part, Chapter XII provides empirical evidence on the *functioning of the peer-to-peer market for tourist accommodation in Latin America*, to reveal the peculiarities of the p2p market with respect to previous research that has analyzed European and North American markets, fundamentally. As far as we are aware of, this research represents the first analysis of the peer-to-peer market for tourist accommodation that takes as a reference several Latin American cities. Namely, different analyses and econometric estimations are performed to identify the variables that determine supply, demand, and prices of accommodation in Buenos Aires, Mexico, Rio de Janeiro and Santiago de Chile.

The structure of the thesis closes with some conclusions. In this final chapter, we specify the key findings, we mention the main policy implications, we refer to the contributions that we have made, we admit certain limitations of our work, we identify some future lines of research, and, finally, we close with several general considerations.

At the time of formally presenting this thesis, most of the chapters had been submitted to academic journals. Some of them are in the review process. Others have passed the first filters, have been modified according to the comments and suggestions of reviewers and have been resent. Finally, the content of the following chapters has already been published:

- Chapter VI. Benítez-Aurioles, B. (2019). Is Airbnb bad for hotels?. *Current Issues in Tourism*. DOI: 10.1080/13683500.2019.1646226. Rank SSCI (2018): 360/2234-Q1.

- Chapter VIII. Benítez-Aurioles, B. (2020) A proposal to regulate the peer-to-peer market for tourist accommodation. *International Journal of Tourism Research*. DOI: 10.1002/jtr.2393. Rank SSCI (2018): 384/2234-Q1.

- Chapter IX. Benítez-Aurioles, B. (2019). Barcelona's peer-to-peer tourist accommodation market in turbulent times. *International Journal of Contemporary Hospitality Management*, *31*(12), 4419-4437. Rank SSCI (2018): 197/2234-Q1.

- Chapter XI. Benítez-Aurioles, B. (2020). Impacts of the peer-to-peer market on tourist accommodation on the Balearic Islands of Mallorca and Menorca. *Island Studies Journal*. DOI: 10.24043/isj.108. Rank SSCI (2018): 1796/2234-Q4.

I.4. Data and methodology

The lack of official statistics hinders the analysis of p2p markets, but scraping techniques let researchers store and organize public information on every advertisement available on a given Internet platform at a date. For Airbnb, there are various initiatives: InsideAirbnb (www.insideairbnb.com), which defines itself as an independent, non-commercial set of tools and data, and provides information on accommodation in more than fifty cities of the world, disaggregating by attributes, location, owner characteristics and booking policy; or AirDNA (www.airdna.co) that, while its access is restricted for non-subscribers, has made the temporal evolution of the number of listings in the greater part of cities and towns in the world easily viewable. Additionally, other sources will be used, among which Exceltur, which provides information on hotel performance, the National Statistical Institute of Spain, and the Datastore of the Greater London Authority.

As for the methodology, we follow the conventional structure for economic analysis. Regardless of punctual descriptive analysis and of the mandatory literature review, the theoretical models that we construct are taken to the data in terms of econometric equations. For the different types of statistical information (time series, cross-sections, panel data), the most rigorous estimation techniques that account for and exploit their properties best will be used. The statistical package of use will be mainly Stata. On the basis of the outputs, we move on to interpreting the results in order to quantify the

relationships between variables and contrast the proposed hypotheses, which will be complemented by the relevant statistical tests.

Theoretical models are built on the basis of the principles of conventional economic analysis. In particular, we assume that individuals take their decision thinking in marginal terms, and comparing costs versus benefits. Consequently, we propose profit and utility functions that are optimized, to explain and predict reality. The underlying hypothesis is that this simplification of the real world allows us to present in an accurate and concise manner the functioning of the market and to explain agents' behavior. Anyhow, every time a theoretical model is formulated, we implement it with available data, as the aim of our thesis is in all times to be within the frame of applied economics.

Still, the construction of theoretical models and their practical implementation have not always been the road that has been followed to advance in research. Sometimes, a simple descriptive analysis or the use of tests and elementary statistical indexes have been enough to deduce satisfactory results according to the chosen objectives. For instance, to determine whether there is an association between hosts' professional character and demand received by their accommodations, the chi-square test was sufficient. To check the evolution of seasonality of tourist demand, it was enough to calculate the Gini coefficient. To represent the concentration of demand, we use the Lorenz curve to quantify the concentration of supply, on top of the Gini coefficient, the Herfindahl-Hirschman Index and other basic indicators that will be defined once they are employed.

Prevalently, the reference framework for econometric estimations consisted of hedonic pricing models, based on the contribution of Rosen (1974), whose premise was that the price of a good—in our case, accommodation—can be decomposed in function of its characteristics or attributes. The idea is based on the fact that the set of attributes or characteristics of a good Z_k is reflected on its market price; therefore, the hedonic function of the price can be represented as the function of attributes of the good, $p(z) = f(Z_1, Z_2, \dots, Z_n)$. Thus, once we have observed the prices of the good and their respective attributes, and collected them in a data set $p_i(z), Z_{ik}; i = 1, \dots, n; k = 1, \dots, K$, the implicit prices of each attribute $[P(z_k)]$, can be obtained.

The usual method to estimate linear regression parameters is that of ordinary least squares. Sometimes, the form will be nonlinear (probit or logit). Besides, we will also utilize the differences-in-differences (DiD) and the multilevel techniques.

These nonlinear techniques (except the DiD analysis) are estimated through maximum likelihood. The maximum likelihood estimator (MLE) is the set of values for the coefficients to estimate in a model that solve the maximization of the probability of the data set being produced i.e. the likelihood function. This is the way in which nonlinear models, such as the probit or logit, are estimated. That is, the parameter or vector of parameters *b* that solve

$$\hat{b} = \arg\max_{b \in \Theta} L_N(b; w)$$

where *w* is the observational data, Θ is the admissible set of parameters, *N* is the size of the sample and L is the likelihood function.

Models that are estimated through this method in our research are those related to *nonlinear probability*. We used those when the outcome of a regression model is not a continuum—such as the price—but rather, a question that can be answered by *yes* or *no*, or conversely, in two categories (taking one as default and the other as the alternative). This is referred to as a binary variable, and we will refer to it as *w*. The prediction of a regression, in this case, should be proportional to the likelihood of the first event (*w*=1) being true. It is still possible to use the OLS model to predict binary variables, as follows:

$$w_i = \beta' X_i + u_i$$

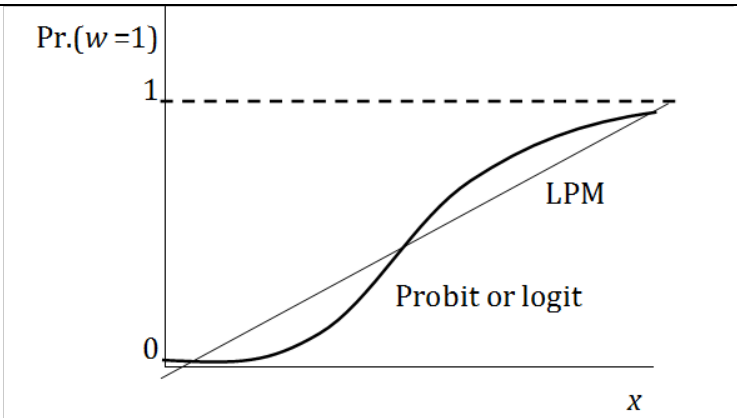
where $\beta = (\beta_1, \dots \beta_J)', X = (x_{i1}, \dots x_{iJ})$. In this case, the coefficient β_j associated to x_j represents the change in probability that the first event is true once x_j change in a unit holding constant all other regressors $k \neq j$, if any of them are present.

Ideally, we would like to interpret the model prediction for an individual *i*, $\widehat{w_i}$, as the probability that *w*=1 is true for individual *i* given its values of the vector of regressors X_i. The problem with the so-called linear probability model (LPM) is that it can yield values below 0 and above 1, which cannot be interpreted as probabilities. The solution is to transform values below 0 as 0, and values below 1 as 1. This leads us to the measure of fit used for the evaluations of these models: the *pseudo-R-square*. Because it would not

be possible to get a perfect fit in this settings—the values predicted will be a probability between 0 and 1 as there is variance in the data, however the real observations are either 0 or 1; hence there will never be a perfect match up—we assign the predictions 0 if $\widehat{w_i} < 0.5$ and 1 if $\widehat{w_i} \geq 0.5$.

There are two alternative models that we use to the LPM, that have the advantage of containing the predictions between 0 and 1, and to have a shape that implies that around centric values of *x* the effect of *x* on *w* is softer, and around the extremes of *x* (lower and higher, or vice-versa if the coefficient sign is negative) it contributes more sharply to modify the probability (towards 0 and 1, correspondingly). A sketch of these arternative functions and their comparison to the LPM in terms of the relationship between *x* and *w* is plotted in Figure I.1.

Figure I.1. Comparison of LPM and probit/logit for a positively-influencing variable *x*



The first alternative is the *probit*, which assumes the underlying distribution is normal.

$$Pr.(w = 1|X) = \Phi(\beta' X)$$

where Φ is the cumulative standard normal distribution. The second is the *logit*, which is similar, except it uses the logistic function instead,

$$Pr.(w = 1|X) = \Lambda(\beta' X) \equiv \frac{1}{1 + \exp(-\beta' X)}$$

The coefficients are not directly interpretable, unlike in the LPM, except for their sign, which is interpreted as usual. The *marginal effects of* x_i need to be derived, which are the derivative of the estimated modelled function with respect to the regressor *i*, for given values of the rest of the regressors. For the LPM, this derivative was simply β_i. Tests

based on the comparison of the likelihood values allow to compare these three models (LPM, logit and probit), although typically we have presented all three versions in our research.

In terms of the data format, economics—as a science—has to test the efficacy of certain policies or other actions (treatments), as well as their efficiency when compared to other treatments. Suppose *D* is a binary variable that takes value 1 if the individual was treated and 0 if not. Ideally, what we would like to measure is the potential treatment effect on a variable of interest *Y*, i.e. the difference in conditional expectations,

$$E[Y_i|D_i = 1] - E[Y_i|D_i = 0] \equiv Treatment\ Effect$$

for a given individual (person, city, listing, etc.). Unfortunately, it is not possible to measure the same individual being treated and not treated at the same point of time, so economists resort to *experiments*.

The golden standard for the perfect experiment is the randomized control trial—since randomizing the treatment is what prevents selection bias. Ideally, we would like to have a treatment group and a control (or placebo) group with similar characteristics, or with different characteristics that do not influence the treatment or can be controlled for. In medical experiments, such as those that evaluate a drug, the treated and the control groups do not know to which group they belong, since the controls are given a placebo. In economics, laboratory experiments are possible, e.g. asking a pool of participants to play a game that involves real money and examining their behavior. However, these experiments in the context of Airbnb have to be limited mostly to hypothetical choices (e.g. asking what listing would the participant choose among a series of listings); moreover, we would need many resources in order to have a significant sample size of participants for its validity.

Fortunately, certain events in real life can be considered *"as if" random*, in terms of an outcome we want to observe. For instance, political disturbances (unrelated to tourism or the sharing economy) or terrorist attacks can be considered *exogenous shocks* to the p2p accommodation market. We call those situations in econometrics *natural experiments* or *quasi-experiments*. Similarly, a law controlling said market that is applied to certain areas of the city but not to others, as long as we can control for the relevant characteristics, can

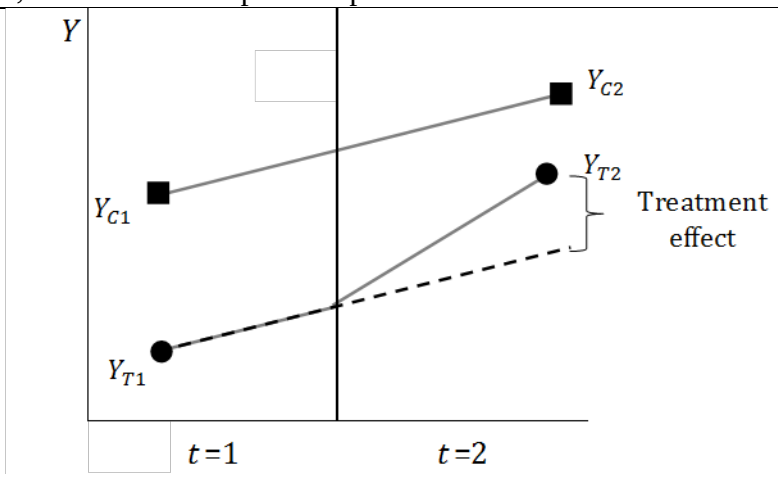
be considered a *treatment* to these areas. Suppose we have a data panel at two points in time $t = \{1, 2\}$, corresponding to before and after the experiment, respectively.

Overall, the key assumption that is needed is that of *parallel trends*. That is, after controlling for all observables, and no matter what level they started at, the two groups would have varied by the same amount between the two periods. Therefore, we can attribute the mean difference in final outcomes of the treatment with respect to the control group in the second period, after having subtracted their mean initial difference in the first period, to the effect of the treatment.

$$\widehat{\beta_{DiD}} \equiv (\overline{Y_{T1}} - \overline{Y_{T2}}) - (\overline{Y_{C1}} - \overline{Y_{C2}})$$

where *T* stands for *Treatment* and *C* for *Control*. The graphical identification of the treatment effect under the parallel trends assumption is represented in Figure I.2.

Figure I.2. Identification of the treatment effect with a data panel of two periods, two individuals (control, *C*, and treated, *T*), where the time trend and the treatment effect are positive, under the assumption of parallel trends.



Equivalently, to estimate it by OLS, controlling for observables, we run the following estimation,

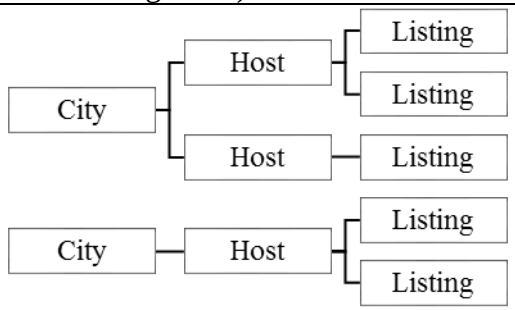
$$Y_{it} = \alpha + \beta_{DiD} D_i P_t + \beta_{FE} D_i + \beta_{TE} P_t + \sum_{j=1}^{J} \beta_j x_{jit} + u_{it}$$

where *i* is the individual, α is a regression constant, P_t is a binary variable that takes value 1 when $t = 2$ and 0 when $t = 1$, x_{jit} $(j = 1, \ldots J)$ is a series of covariates, and the rest of the terms are defined as before. The coefficients are β_{DiD} for the DiD estimator of the

average treatment effect; β_{FE} for the individual time-fixed effect; β_{TE} for the time effect; and β_j $(j = 1, \dots J)$ are the coefficients for the covariates. u_{it} is the error term that varies across time and individuals, which is preferably estimated using heteroscedasticity-robust standard errors, to correct for the likely correlation within the same individual. A common test to verify the validity of the DiD approach in a quasi-experimental context is, if data of previous periods is available where no external shocks relevant to *Y* have taken place, running the same regression and verifying whether the estimate of β_{DiD} is insignificantly different from zero. If that is the case, it implies that it is realistic to assume that the parallel trends assumption held during that timeframe.

However, some data might be structured hierarchically in terms of levels (nested). In this case, multilevel models are useful to correctly estimate relationships and obtain the effect of the different levels. Individual observations are referred to as the first, basic, inferior or micro-level, and they are grouped by second or macro-level. There might be more than two levels, such as those in the Figure I.3.

Figure I.3. Example of a hierarchical dataset in the context of Airbnb with three levels (city, host, and listing in decreasing order).



When analyzing the effect of an independent variable on a dependent variable, we expect the effect of observations in the same group or cluster to be more similar than those in different ones. The OLS assume independent observation and hence uncorrelated errors. Then, we might end up with a falsely significant effect of the beta coefficient since inter-group variance is not accounted for.

The most basic regression model (which is referred to as the null model) simply adds an intercept, which will correspond to the mean of the data. The subindex for individuals is *i* and that for the subgroup they belong to is $j = 1, \dots J$.

$$y_{ij} = \beta_0 + \varepsilon_{ij}$$

The next model is called the *variance components model*, because it decomposes the variance into the individual and into the group.

$$y_{ij} = \beta_0 + u_j + \varepsilon_{ij}$$

where β_0 is *y*'s mean among the population, u_j is the difference between the mean in group j and the population mean, and ε_{ij} is the difference between the individual and the group mean. We assume these two differences are normally distributed with mean 0 and respective variances σ_u^2 and σ_ε^2.

The variance partition coefficient (VPC) deduced from the multilevel model is the proportion of the total variance explained by intra-group variance, and can be interpreted as the expected correlation between two randomly drawn individuals within the same group

$$CPV \equiv \frac{\sigma_u^2}{\sigma_u^2 + \sigma_\varepsilon^2}$$

It is comprised in [0, 1], 0 meaning no difference between groups and 1 meaning no difference between individuals. In the Null model, the CPV is equivalent to the intra-class correlation (IIC). To test the null hypothesis of no difference between groups (and hence no need to use a multilevel model), a likelihood test is run comparing the null model and the variance components model.

Building on that basis, we can construct the regression model of *random intercepts*,

$$y_{ij} = \beta_0 + \beta_1 x_{ij} + u_j + \varepsilon_{ij}$$

which means the intercept will vary by group and is equal to $\beta_0 + u_j$. We can even build a *random slope (and intercept) model*,

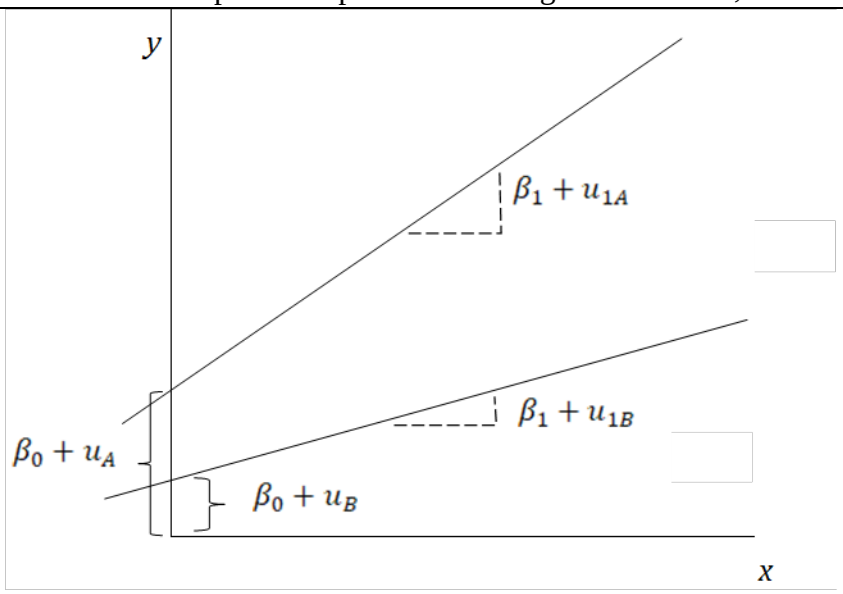
$$y_{ij} = \beta_0 + \beta_1 x_{ij} + u_{1j} x_{ij} + u_{0j} + \varepsilon_{ij}$$

where now the group slope is $\beta_{1j} = \beta_1 + u_{1j}$. Now, the CPV can be rewritten as

$$CPV \equiv \frac{\sigma_u^2}{\sigma_u^2 + \sigma_\varepsilon^2} = \frac{\sigma_{u0}^2 + x_{ij}^2\sigma_{u1}^2 + 2x_{ij}^2\sigma_{u0u1}}{\sigma_{u0}^2 + x_{ij}^2\sigma_{u1}^2 + 2x_{ij}^2\sigma_{u0u1} + \sigma_\varepsilon^2}$$

Figure I.4 illustrates how the regression parameters on a multilevel model that allow for random slopes and intercepts can vary in function of the group to which the individual belongs.

Figure I.4. Random intercept and slope multilevel regression model, of the effect of *x*



Naturally, each of the techniques described have been adapted according to the needs of the research. We did not seek analytical sophistication or technique refinement, but rather, to find the answers to the research questions posed. The tools have been statistical and econometric methods. Sometimes, we have considered that a descriptive analysis was sufficient. On other occasions, we had to make use of more complex tools. If the metaphor is admitted, we have walked when the distance was short and we used the means of transport available when we wanted to go further.

II. STYLIZED FACTS IN THE PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION

II. 1. Introduction

The advantages provided by the Internet in facilitating the meeting of supply and demand have led to the development of so-called peer-to-peer markets. In them, a broad range of goods and services are traded, and agents are able to play diverse strategies to achieve their goals, given their own preferences and constraints. Like in any other market, the laws of supply and demand are at play; but, at the same time, there are new variables contributing to determining prices and the conditions under which trade takes place. In this context, many of the problems of traditional microeconomic analysis (market structure, consumer choice, price formation, asymmetric information, etc.) have been rethought, thus generating very novel contributions in the field of industrial organization.

In spite of the presence of generic market characteristics that have been subject to evaluation and discussion (Einav *et al.*, 2016), some of these markets have special relevance and have sparked intense debate, well beyond the purely academic scope. More specifically, the exponential growth experienced by the peer-to-peer market for tourist accommodation has elicited enormous social and political interest, attested by the considerable volume of literature que, recently, has been revised and structured (Dann *et al.*, 2019) and has raised a series of questions that could guide future research (Dolnicar, 2019). In such a context, it is pertinent to determine how far we have come in the knowledge. Thus, the purpose of this paper is to determine the empirical regularities that have been discovered which allows us to list a series of stylized facts proposals. These, in some cases, will need to be confirmed by future research; and, in others, await a theoretical framework explaining them.

To this end, we will take as reference the Airbnb platform for several reasons. First, since Airbnb has grown at a spectacular rate since its foundation in 2008, reaching more than five million listings worldwide and surpassing the joint offer of the top five hotel chains in the world (Hartmans, 2017), it has earned indisputable leadership position among the facilitators of peer-to-peer accommodation trading (Hajibaba & Dolnicar, 2018a). Secondly, from the academic point of view, Airbnb has been the typical example used to illustrate analyses on the peer-to-peer market for tourist accommodation. Thirdly, there is already an appreciable array of analyses which from different perspective and data on the supply and demand of accommodation on Airbnb, has revealed certain peculiarities about the functioning on the peer-to-peer market that lets us discern some stylized facts.

Precisely, in this moment, when many lines of research are open, is opportune to nail down the regularities detected and which questions are still open to debate.

Although we will focus on the research conducted on Airbnb, references to broader analytical frameworks will be inevitable. One of them is the so-called sharing economy, to which we will devote the next section. We will find conceptual contributions and an effort to determine, through surveys, the motivations of hosts and guests who use Airbnb. Then, in section 3, we discuss features that are common to other Internet-based markets like Airbnb, such as the reduction of information, search and transaction costs. There, we notice some nuances that set Airbnb apart from the first platforms that started facilitating remote trade. Specifically, given the personal nature of the relationship that handing over or occupying somebody's home requires, special attention is paid to the possible existence of discrimination (section 4), and to confidence-building mechanisms meant to enforce trade (section 5).

Another issue that has attracted the attention of researchers is that of the determinants of prices of Airbnb accommodation, which will be dealt with in section 6. The absence of official statistics has been circumvented thanks to scraping techniques, which allows the knowledge of the key variables that influence price. We will see that, just like in traditional markets, they have to do with the attributes of the product that is exchanged. Some matter in both kinds of accommodation, but have different importance, such as location or included amenities. Finally, we will see the price-determining role of those that are specific to the format in which the Airbnb website functions, such as reservation policy, reviews, ratings and host attributes.

Afterwards, in section 7, we will deal with the empirical evidence available on the impact that Airbnb has had on hotels, income, employment and housing, and certain external effects that have been documented. These are the issues for which simplistic statements cannot be supported by the soundness of analyses thus far. Actually, contributions in this field are not numerous, and are to all appearances a rich area for future research. Finally, before proceeding to some conclusions, we will devote a brief eighth section to the attempts to classify the regulations at different levels of the public administration that have been passed to regulate Airbnb's activity and, by extension, of peer-to-peer tourist accommodation markets; and the effects they have had.

Following this roadmap, we will highlight some stylized fact proposals that illustrate what we have learned to far, while also providing clues for future research.

II. 2. Sharing economy

Expressions such as "sharing economy" or "collaborative consumption" are commonly found in the literature. Belk (2014) differentiates sharing and pseudo-sharing economy. The latter is distinguished by the presence of profit motives, the absence of feelings of community, and expectations of reciprocity. It has even been argued that Airbnb is "practically synonymous with the sharing economy" (Schor, 2014). Yet, this is still a question of debate to the extent that some consider it relevant to clarify whether Airbnb is part of the sharing economy (Reinhold & Dolnicar, 2018). Any consideration on this subject will, of course, depend on what it is meant by sharing economy. Therefore, if we accept that Airbnb is a for-profit organization which takes a commission on the rental prices when home owners host guests, then it would belong to what Belk (2014) refers to as pseudo-sharing economy. Indeed, it is obvious that, in spite of Airbnb's efforts to present itself as a promoter of solidarity-based experiences, such as providing temporary homes to people affected by natural disasters, conflicts, or illnesses (Airbnb, 2020a), there is also—as in any other market transaction—a flow of money that compensates the provision of a service. Thus, according to the typology of networks made out by Oskam and Boswijk (2016), Airbnb was included in the category of network capitalism, that is to say, hyperconnected and distributed platforms with a commercial goal. In an analogous manner, Hajibaba and Dolnicar (2018a) introduced a typology of peer-to-peer accommodation network facilitators and included Airbnb in a category where, besides the role of host credibility, trade takes place for commercial motives.

Nonetheless, evidence has also been provided that there are motivations aside from profit-making to use Airbnb. There is an extensive range of contributions, many of which based on surveys, that testify that accommodation demand in the peer-to-peer market is explained by both economic and emotional reasons (Camilleri & Neuhofer, 2017; Guttentag, 2015; Möhlmann, 2015; Priporas *et al.*, 2017; Tussyadiah, 2016; Tussyadiah & Pesonen, 2016; Tussyadiah & Zach 2017; Wiles & Crawford, 2017; Wu *et al.*, 2017). Anyhow, the use of more sophisticated techniques, such as the fuzzy-set qualitative comparative analysis employed by Pappas (2017), evidenced the complex formulation of

tourism decisions during recessions in which both social and economic attributes are valued.

From the hosts' point of view, the importance of non-economic motivations has also been made clear (Deale & Crawford, 2018; Ikkala & Lampinen, 2014; Karlsson & Dolnicar, 2016). That is, monetary exchange would be combined with social exchange and allows the hosts to select the guests according to their own preferences (Ikkala & Lampinen, 2015).

There are, thus, both economic and non-economic motivations to use Airbnb; both from the guests' and the hosts' behalf. Even if, as noted by Yannopoulou *et al.* (2013) there are a few similarities with other platforms such as CouchSurfing, a free peer-to-peer accommodation hosting community, as many features of a commercial transaction are present, Airbnb would be halfway between *pure sharing* and *pure exchange* (Habibi *et al.*, 2017).

Stylized fact proposal 1. Hosts and guests join the peer-to-peer market for tourist accommodation for both economic and emotional reasons.

However, if the emphasis to define what is understood as sharing economy shifts from participants' motivations to the mechanisms of the platform to facilitate the meeting of individual sellers and buyers, then the debate as to whether Airbnb belongs to the sharing economy or not ceases to be relevant. Given that undoubtedly Airbnb and many other Internet-based firms facilitate transactions, then the focus would shift to the study of peer-to-peer markets, with which we would avoid *semantic confusion* (Belk, 2014) or *conceptual ambiguity* (Codagnone *et al.*, 2016) when we refer to the sharing economy. From this angle, sociological or psychological analyses lose interest compared to those that are purely economic. The questions, consequently, are related to the functioning of peer-to-peer markets, and more specifically to the new mechanisms for search and matching and the associated risk of discrimination, for trust and reputation and for pricing; and their possible external effects on the economy and more, as well as the related regulation.

II. 3. Search and matching

Airbnb is an example of what Rochet and Tirole (2003) defined as two-sided markets and has revolutionized the role of Internet-operating forms by permitting direct and personal contact between suppliers and demanders; as opposed to other platforms such as eBay that facilitates trade of goods in a distant and impersonal manner. What ultimately sets apart these platforms from any other firm or intermediary is that they allow direct contact between two distinct sides and each side is affiliated with the platform. Its success resides on its ability to exceed the minimum threshold and initiate the virtuous cycle by which the more users are on one side, the more attractive it is for those on the other side to join the platform (Eisenmann *et al.*, 2006). Looking at Airbnb's, it is clear that a huge network has been formed, which is appealing for both hosts and guests: more than 6 million listings in more than 80 thousand cities in the world, which have attracted around 500 million guests since its foundation (Airbnb, 2020b). This business model emerged in the right moment, offering to home-owners the possibility to earn additional income in the middle of a deep financial and economic crisis, through an attractive and flexible proposal (Boswijk, 2017). All these circumstances came together to create the 'perfect storm' for Airbnb's exponential growth (Dredge *et al.*, 2016).

One of the reasons for Airbnb's success is its ability to find the *perfect match* (Dolnicar, 2018). The wide variety in supplied housing, each with its peculiarities, allows customers to choose the option that best suits their preferences. This marks a significant difference with respect to conventional accommodation, which Airbnb insists on with its advertising strategies such as inviting guests to 'feel at home' and to find an 'atypical place to stay' (Liu & Mattila, 2017). In fact, the expectation of a unique experience and familiarity exert influences on repurchase intention of travelers that utilize Airbnb (Mao & Lyu, 2017).

A necessary condition to find the *perfect match* are modest search costs. In Internet-based markets, the meeting of supply and demand is generally facilitated by setting filters that sort information according to the user's preferences. However, the fact that information and search costs have been drastically cut thanks to the Internet does not mean that they are negligible. As boldly put by Hsu *et al.* (2017), these costs will always exist, even if they are just those from moving one's eyes down a list. Thus, the order in which data is presented influences the final decision. Yet, even if contributions evidencing the relevance of order in a list of options for the final choice (Rubinstein & Salant, 2006),

quantifying this effect is hard for Internet-operating firms, because of the feedback between the fact that, on the one hand, users pay more attention to first-ranked search results and, on the other, firms place on top of their listings their most demanded products. In other words, this is a simultaneous causality problem, which despite various contributions having been made in this area, keeps the debate on the influence of rankings on consumers open (Ursu, 2018).

Stylized fact proposal 2. One of the reasons explaining Airbnb's exponential growth is its capacity to match hosts with guests' demand at a reduced cost.

The goal of Airbnb is to put in place the necessary conditions to maximize the number of matchings, and so, to optimize its turnover as both hosts and guests are changed a rate every time a booking is confirmed (Airbnb, 2020c). When one makes a search through Airbnb, an algorithm is activated 'to help guests find the perfect listing for their trip—and help hosts find guests who are a great fit for their space' (Airbnb, 2020d), although the exact list of elements included in it is secret.

Even though the set of factors involved in the algorithm is not fully disclosed, we do know a few details that help understand the process. In sum, these are factors that model the needs of guests (from where the search is performed; previous trips; what type of ads have been clicked or saved before, etc.), the ads' features (ratings, rates, location, hosts' response time, possibility to instant book, etc.), and reservation details (number of guests, trip duration, desired price range, etc.). The fact that the algorithm is not fully transparent may raise the concerns of hosts, who do not exactly know how their actions are evaluated; and thus, do not know how to make their accommodation rank higher when potential guest performs a search. This feeling of uncertainty and lack of control has been described and given the name of *algorithmic anxiety* (Jhaver *et al.*, 2018).

By disclosing part of its algorithm, Airbnb offers a series of guidelines to minimize the number of rejected booking requests since, as pointed out by Fradkin (2017), sellers who reject buyers generate a negative externality in the platform, as no one likes to be rejected. Moreover, strategies have been designed to maximize the number of successful matches. From a theoretical perspective, Romanyuk (2017) proved that when the platform controls information of both buyers and sellers, it would be efficient to reveal only a part of the information to increase the probability of a match. On a practical level, as done by Airbnb,

it is possible to grant higher priority to listings that do not often reject requests or that simply have enabled instant booking (Airbnb, 2020e). This is an issue directly related with another question of debate, both sociopolitically and academically: discrimination.

II.4. Discrimination

In conventional accommodation, all reservations are in principle "instant booking". On the contrary, in accommodation marketed through Airbnb, the host has the possibility to learn how his or her potential customers are like before admitting them into their property. Analogously, by publicly listing the features of both housing and hosts, guests are able to take more well-informed decisions. When the guest is not able to inspect the product, and when the host ignores the risks of letting a stranger in his home, situations of adverse selection can prevent an otherwise satisfactory transaction. The more complete the information is on both sides, the higher the probability of successful matches being made. Textual description and pictures can help here. Alongside pictures of the accommodation, for which Airbnb offers professional photography services (Airbnb, 2020f), users are required to upload a picture showing their face for verification (Airbnb, 2020g). They are even encouraged to link to their Facebook profiles (Airbnb, 2020h). Although on the one hand, this strategy can dispel many uncertainties surrounding the transaction, it can also occasion other problems. Namely, when personal characteristics are revealed, it is opening the way to possible discrimination by race, sex, or whatever other condition.

One of the first works in addressing the issue of discrimination in Airbnb is, to our knowledge, that of Edelman and Luca (2014). These authors noted that, working with a sample of over 3,000 listings in New York, controlling for all visible information, non-Black hosts charged 12% more than Black hosts for similar accommodation. Later, Gilheany *et al.* (2015) employed a sample of standard accommodations in the cities of Oakland and Berkeley and saw that Asian hosts earned on average 20% less than Whites. In a similar vein, Kakar *et al.* (2016) studied the market of Airbnb in San Francisco, noting that Hispanic and Asian hosts set prices from 8 to 10% lower than White hosts, after controlling for neighborhood property values, user reviews and rental unit characteristics. Cansoy and Schor (2016) analyzed a data base of approximately 125,000 listings belonging to 104 US metropolitan areas and found that neighborhoods with a significant

percentage of non-White population, despite higher rates of participation, and higher numbers of reviews per listing, command lower prices, are rated worse, and generate less income. Similarly, using data from Airbnb supply in 19 cities in North America and Europe, it was found that hosts belonging to an ethnic minority charged 3.2% less than other hosts, when differences in locations and observable characteristics are accounted for (Laouénan & Rathelot, 2017).

However, studies mentioned in the previous paragraph do not determine to which extent the price difference is caused by discrimination and to which it is a strategy set in motion by the affected groups to maximize their gains. Thus, we can pay attention now to other studies, based on experimentation. In one of them, Edelman *et al.* (2017) made an experiment in different American cities in which it was attested that having a typically Afro-American surname lowers the chances of admission of the potential guest by 16% with respect to having a White-sounding name. An interesting real case is that of an Afro-American customer that sued Airbnb, claiming that he was rejected using his personal profile, but accepted for the same date range in the same accommodation while using a fake White man's profile (Barken *et al.*, 2018). Actually, the hashtag *#airbnbwhileblack* has spread to raise awareness about discrimination in Airbnb. Ahuja and Lyons (2017) devised a similar experiment to determine if there is discrimination according to guests' sexual orientation. The following message was sent to almost 800 hosts in Dublin: *"Hello! My name is (male/female name) and my (boyfriend/girlfriend) and I are interested in renting your place for a few days. Do you have any availability? Thanks!"*. Results demonstrated that male couples had around 20-30% lower chances of being admitted than female or mixed couples.

A quick reading of the research made until now may led us to the conclusion that, indeed, Airbnb's system makes discrimination by race or sexual orientation possible. Yet, Cui *et al.* (2016) replicated Edelman *et al.*'s (2017) experiment in three American cities with a small twist. They differentiated three groups of potential guests: those with zero reviews; those with a positive review; and those with a negative review. Then, once guests with no reviews sent a booking request, the acceptance rate for white-sounding surnames was 48% while those with black-sounding surnames was just 29%; a result in line with Edelman *et al.*'s (2017). Nevertheless, when potential guest did have a review, either positive or negative, the acceptance rate in both groups was similar. The fact that discrimination apparently goes away when there is a review suggest that the roots of

discrimination where not racism per se, but in the risk perception of hosts. Along this line, the work of Hajibaba and Dolnicar (2018b) stated, after analyzing a questionnaire made to 189 Airbnb hosts offering properties in Australia, that results did not agree with the notion that personal characteristics of either the guest or the host would play a major role in hosts declining booking requests. Instead, what is relevant for the host is the risk associated to each reservation.

There is also empirical evidence on the impact of the host's profile picture in terms of trust or emotions. In this way, Ert *et al.* (2016) recruited 900 workers through the website Amazon Mechanical Turk to rate the pictures of hosts offering accommodation though Airbnb in Stockholm as of June 2015. Results show that the more trust-inducing the host's picture is, the greater the price; meanwhile, reviews scores did not have a significant influence in the price nor in the probability of being booked. For their part, Fagerstrøm *et al.* (2017) made a controlled experiment in which a group of 139 undergraduate students in Norway were shown the pictures of an alleged host with different expressions (anger, joy, neutral, and head silhouette). They found that a negative facial expression and absence of facial image (head silhouette) decreased the likelihood to rent and cannot be compensated for by a low price. This question has also been analyzed from the hosts' angle, to learn about reason that influence the decision of admitting or rejecting certain guests. Thus, Karlsson *et al.* (2017) asked a sample of hosts offering accommodations in Australia and found that the potential guest's travel motives mattered, but so did other characteristics such as sex, age, race, and even the presence of sunglasses or of another person in their photos.

Stylized fact proposal 3. The access to information on personal characteristics of hosts and guests gives way to discrimination in the peer-to-peer market for tourist accommodation.

As pointed out by Cheng and Foley (2018), digital discrimination contains multiple layers and meaning constructions. Either way, Airbnb has been accused of reintroducing discrimination into the hotel and housing business and to be dismantling generations of civil rights in the name of progress (Ravenelle, 2016). In front of the criticism received, Airbnb reinforced their anti-discrimination policy towards the end of 2016 with new measures including an explicit compromise of equal treatment regardless of race, religion, national origin, disability, sex, gender identity, sexual orientation or age; promoting the

use of instant booking; taking the spotlight away from photos in the booking process and the improvement of user profiles with objective information (Murphy, 2016). Nonetheless, the conflict between anti-discrimination policies and the owners' right to choose who to let in their homes still makes those measures a subject of contention.

II.5. Reputation

In markets, in general, and in those that operate through the Internet in particular where there is a multitude of sellers and buyers who interact remotely, trust is essential for transactions to take place. Of course, the existence of a justice system is necessary to enforce contracts and punish fraud. But at the same time, reputation is essential to promote trade, whether it is certified through an external organism or by people's opinions. With the advent of Internet, the traditional word of mouth (WOM) was replaced by the electronic word of mouth (e-WOM), which generated interest in the extent to which it influences consumer purchase intention and online sales in the tourism sector (Schuckert *et al.*, 2015). Here, evidence has been provided that a higher customer rating significantly increases the online sales of hotels (Öğüt & Onur Taş, 2012) and that traveler reviews have a significant impact on online sales (Ye *et al.*, 2009; Ye *et al.*, 2011).

The system established by Airbnb allows reviews both from hosts to guests and from guests to hosts (Airbnb, 2020i) so that both contribute to what Dolnicar (2018) refers to as peer-to-peer curriculum vitae (P2P-CV), which conditions their future transactions. Guests, besides writing a comment, can rate their stay on a scale of 1-5 for overall experience (general evaluation of the stay), cleanliness (degree of cleanliness and order of the accommodation), accuracy (the extent to which information listed in the ad is truthful to reality), value (the general feeling of having got a good deal in terms of the quality-to-price ratio), communication (the readiness of the host to communicate with the guest, both before and during their stay), check-in (the smoothness of the arrival process), and location (the guest's opinion with regard the area in which the accommodation is located). These ratings left by guests belong to the set of factors that can allow hosts to acquire the superhost status. Some, such as location, are beyond the control of hosts; others, such as cleanliness, are more controllable. In this regard, Abramova *et al.* (2015), utilizing experimental methods, determined that when the subject of a complaint cannot be controlled by the host, strategies such as acknowledging, apologizing for or denying

the problem can reinforce trust. On the contrary, when the subject of the complaint is under the host's control, denying the problem does not help with consumer confidence.

This combination of reviews and ratings should be in principle a very useful mean to evaluate any transaction, were it not for the bias that affects markets that operate through the Internet. Namely, the exaggerated tendency to positive valuations does not help to identify problematic subjects. Hu *et al.* (2009) referred to the graphical representation of the valuation frequency in the vertical axis, with respect to the point scale in the horizontal axis, as a "J-shaped distribution", since concentration grew exponentially towards the end of the point scale. This fact, which had been noted on eBay before—where more than 80% of users had a percentage of positives of greater than 99% (Bolton *et al.*, 2013)—is now observed in Airbnb as well.

In fact, Zervas *et al.* (2015) taking a database of slightly more than 225,000 listings with a minimum of three reviews (as, below that number, Airbnb does not make rating information public), discovered that more than half of the properties boasted a top 5-star rating, and 94% of properties rated at 4.5 stars or above and virtually none have less than a 3.5-star rating. Subsequently, a larger-scale study using a crawled data set containing 2.3 million listings, noted that 89.5% of those who had received valuations had 4.5 or more stars, and the mean (median) of ratings was 4.67 (4.5), and that the number of listings with 3.5 stars or less was practically negligible (Ke, 2017). Similarly, a qualitative analysis detected a tendency to positive comments, and that not-so-positive experiences were often coded in a subtler and more nuanced manner (Bridges & Vásquez, 2018).

Stylized fact proposal 4. Airbnb ratings are biased upwards.

Various arguments have been put forward to explain the bias in this distribution. First, this phenomenon could be associated with herding-type models, where each decision maker can see the decisions of previous decision makers before taking his (Banerjee, 1992). In these models, although each individual's information use and behavior are rational, the final outcome might be inefficient. In a large-scale random trial, it was evidenced that knowledge of aggregate decisions distorted individual decision-making and created a tendency to positive rating "bubbles" (Muchnik *et al.*, 2013). If we acknowledge the upward bias in ratings, it seems reasonable that the number of reviews has a greater weight in consumer decisions, as herding-type models predict. This was

precisely one of the conclusions that Lee *et al.* (2015) drew from data of more than 4,000 listings from various American cities. Similarly, Chen and Chang (2018), through answers to a survey elaborated to learn about the factors fueling purchases in Airbnb, were able to verify that the ratings' impact was insignificant, while volume was not. Herding behavior also makes sense of the reality that most demand is directed towards a reduced portion of the supply of accommodation, while the remaining large part of it has little to no visits. For instance, in the aforementioned study by Ke (2017) it was shown that more than half of the listings—specifically, 54.6%—had not got any valuation, which suggests that they might have hosted little to no guests. Again, admitting the existence of herding behavior, then the first review can make a huge difference (Hill, 2015). It can mean breaking the vicious circle by which some listings are not demanded because nobody has visited them before.

Secondly, to explain the upward bias of valuations in peer-to-peer markets, it can be argued that the most satisfied participants are also the most inclined to leave a valuation. Following this line of reasoning, Li and Hitt (2008) build an interesting model that was empirically validated using online book reviews and sales data collected from Amazon, in which there is a correlation between being the first consumers of a product and the likelihood of satisfaction after the purchase. As a consequence, the first valuations are upwardly biased due to a self-selection problem, which would condition subsequent purchases as well. By the same token, it is possible that unhappy customers would rather stay silent and not voice their poor experiences. This phenomenon was already observed in eBay (Dellarocas & Wood, 2008; Bolton *et al.*, 2013; Nosko & Tadelis, 2015). Leaving a negative comment might mean putting up with harassment from the reviewed to modify it or to expose oneself to be negatively counter-evaluated. If leaving a negative review is costlier than leaving a positive one, it is only natural that valuations will be biased towards positive evaluations. In Airbnb's system, reviews are simultaneously published; or, if one party has not written a review, the remaining one is automatically published two weeks since the departure date. Once reviews are published, one can post a reply, but not delete them. On the one hand, the simultaneous revelation of valuations might reduce the risk of retaliation; or, conversely, of positive reciprocity. Nonetheless, further reciprocity—either positive or negative—is not fully prevented, as later comments are still allowed. Additionally, one must be aware that negative valuations do not only affect the chances of future transactions for the receiver, but also for the submitter; since potential hosts or

guests (depending on the case) might be wary of dealing with this person in the fear of receiving a negative evaluation. For the case of Airbnb, Fradkin *et al.* (2015) carried out an experiment in which guests were randomly offered a $25 voucher to leave a valuation. As a result, not only the number of sent reviews grew—as it could be expected—but also, the share of maximal ratings fell. That is evidence backing up the thesis that a system such as that of Airbnb, that does not compensate for leaving a valuation, favors the upward bias of the rating.

Finally, the possibility of valuation manipulation ought to be considered. Thus, Mayzlin *et al.* (2014) compared hotel valuations in TripAdvisor, where anyone can leave a valuation, to those in Expedia, where, in order to review a hotel, one must have spent at least one night in it. Evidence of manipulation was found in the first website, both positive and negative. At a more general level, different manipulation strategies on the behalf of managers, such as writing self-reviews or involving staff in the writing and posting of favorable reviews (Gössling *et al.*, 2018a) have been described; as well as the counterproductive effects of openly asking guests to leave a positive valuation (Magno *et al.*, 2018a). It has been argued that, in view of the weight that valuations have acquired in capturing customer demand and given the growing market competition, hotel managers face a "prisoner's dilemma" by which manipulation seems to be the rational choice (Gössling *et al.*, 2018b). In theory, in Airbnb, leaving a review is only possible once an accommodation has been used, although, naturally, this does not prevent the occurrence of fake reviews (Edelman *et al.*, 2017; Stemler, 2017). The company has even been accused of deleting negative reviews (Griswold, 2018).

In accordance with the above, it could be said that reputation mechanisms designed for peer-to-peer markets, in general, and in the case of Airbnb, in particular, suffer from certain biases that have not yet been resolved. In consequence, there is large scope for further investigation and solution proposals for asymmetric information problems that have long characterized certain traditional markets and now also hamper efficient allocations in digital ones.

II. 6. Prices

Airbnb does not officially provide individualized data of the accommodations that are marketed through its platform. However, information visible on the net can be

compiled and sorted by means of scraping techniques. In some cases, the data is available thanks to particular initiatives such as *insideairbnb.com*, *tomslee.net* or *airdna.co*. Some academic contributions have utilized information coming from these websites.

Quantitative studies on the price determinants of Airbnb listings are collected in Table II.1. They are relatively few in comparison to those made for hotel rooms (Wang & Nicolau, 2017), and as it can be seen, most of them have been carried out in recent years. In fact, the first studies did not have as a goal to learn about price determinants, but to check for discrimination (Edelman & Luca, 2014; Kakar *et al.*, 2016) or the impact of hosts' photo on Airbnb on guests' decisions (Ert *et al.*, 2016). Their scope and number of variables included is very diverse. Still, they all share the same technical base: assuming that price is a linear function of a series of characteristics related to the accommodation and its host, in accordance to the postulated hedonic pricing models.

Table II.1. Quantitative studies on the determinant of listing prices in Airbnb

Authors	Scope	No. obs.	No. var.
Edelman and Luca (2014)	Nueva York City	3,752	18
Ert *et al.* (2016)	Stockholm	175	10
Kakar *et al.* (2016)	San Francisco	715	18
Benítez-Aurioles (2017)	Barcelona	87,557	39
Chen and Xie (2017)	Austin, Texas	5,779	23
Dogru and Pekin (2017)	Boston	2,699	19
Gibbs *et al.* (2018a)	5 Canadian cities	11,239	16
Hrobath *et al.* (2017)	Vienna	3,877	56
Teubner *et al.* (2017)	86 German cities	13,884	23
Wang and Nicolau (2017)	33 cities in Europe, USA and Canada	180,533	25
Zhang *et al.* (2017)	Metro Nashville, Tennessee	974	5
Benítez-Aurioles (2018a)	44 cities of the world	367,516	10
Magno *et al.* (2018b)	Verona, Italy	1,056	6

A review of the literature on strategies in the hospitality sector evidences that prices are influenced by physical attributes of the hotel, quality signals (star rating, for instance) and the distance to the center of the city, to a transport hub or to some tourist attraction (the beach, for instance) (Abrate *et al.*, 2011). As for studies on pricing in Airbnb, we have distinguished the following main categories of variables: accommodation attributes; distance, host attributes; reviews and rating; and amenities. Table II.2 displays a more detailed list of the variables that are commonly included in existing research. In spite of the relative scarcity of empirical evidence up to now, some regularities have started to appear, suggesting the glimpse of a few stylized facts.

Table II.2. Linear relationship (*) between the price of listings and statistically significant variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13
	Accommodation attributes												
Entire home	+	+	+	+	+	+	+		+	+		+	+
Bedrooms	−	+	+	+	+		+	+		+		+	
Bathrooms			+	+	+		+	+		+		+	
Accommodates	+		+		+		+	+		+		+	
	Distance												
Distance				−		−	−	−	−	−	−		
	Host attributes												
Superhost			+	+		+	+	+		+		+	
Professional						+	+		−	+			+
Seniority				+				+	+				+
	Reviews and rating												
No. Reviews				−		−	−	−	−	−	−	−	−
Overall rating				+	+	+	+		+	+	−	+	
	Booking												
Instant book				+			−			−		−	
	Amenities												
Breakfast				+		+		+		−			
Parking				+			+			+			
Pool							+	+					
Smoking allowed				−						−			
Wifi				+						+			

(*) +, positive relationship; −, negative relationship
1. Edelman & Luca (2014); 2. Ert *et al.* (2016); 3. Kakar *et al.* (2016); 4. Benítez-Aurioles (2017); 5. Chen & Xie (2017); 6. Dogru & Pekin (2017); 7. Gibbs *et al.* (2018a); 8. Hrobath *et al.* (2017); 9. Teubner *et al.* (2017); 10. Wang & Nicolau (2017); 11. Zhang *et al.* (2017); 12. Benítez-Aurioles (2018a); 13. Magno *et al.* (2018b).

II.6.1 Accommodation attributes

First, regarding *accommodation attributes* it is noted that as the number of bedrooms, bathrooms, or guests that can be hosted in the accommodation increases, so does price. Such attributes are associated with the size of the accommodation, and consequently, are positively related to price as one would expect. Yet, in Edelman and Luca's (2014) estimation, a negative relationship between the number of bedrooms and price was found. A possible cause proposed by the authors is that of the interaction between the number of bedrooms and access to the entire house, so that a home with four bedrooms might meant that the guest has to share accommodation with three strangers; while a home with one bedroom means that he is alone.

Stylized fact proposal 5. The number of bedrooms, bathrooms, or guests that can be hosted in an accommodation increases price.

Perhaps it should be taken into account that this study used data on New York listings from 2013; that is, when Airbnb was beginning its expansion. In subsequent years, entire homes gained prominence. As a matter of fact, the cited study by Ke (2017) indicates that the share of entire homes in total accommodation between 2012 and 2016 went from 57% to 68.5%. In parallel, the share of private rooms fell in the same period, from 41% to 29.8%. It can also be inferred from those figures that the share of shared rooms—Airbnb's third room category—was practically negligible. The picture in Verona in 2016 illustrates this point: of the 1,056 available listings in Verona in 2016 only two were shared rooms (Magno *et al.*, 2018b). The considerable percentage of entire rooms compared to private rooms, and the scarce representation of shared rooms (e.g. in France, Italy and Spain, they are less than 1%) have been validated in a recent comparative analysis by countries, with data from April 2016 to November 2016 (Abdar & Yen, 2017). According to Ke (2017), these changes suggest that Airbnb is becoming more of a rental market, and less of a platform to share leftover space. Incidentally, one of the empirical regularities in almost all studies to date is that entire homes, naturally, have a higher price than private/shared rooms.

Stylized fact proposal 6. The weight of entire homes in Airbnb's supply is predominant and growing.

II.6.2 Distance

For the case of hotels, results on the influence of *distance* are remarkably consistent: the closest the hotel is to the city center, the more expensive the room prices are. Yet, there is also evidence of the relationship being the other way round (Chen & Rothschild, 2010), non-significant (Hung *et al.*, 2010), or overestimated, in terms of the central location premium (Lee & Jang, 2012). By contrast, studies considering the influence of distance in Airbnb accommodation registered no exceptions: in all cases, the farthest the accommodation is from the city center, the lowest its price is. There is also available empirical evidence noting that proximity to the nearest landmarks raises the price of accommodation in Airbnb (Li *et al.*, 2016). In relation to this issue, it can be said that Airbnb has a greater ability to capitalize the advantages of proximity to tourist

attractions compared to the hotel sector (Gutiérrez *et al.*, 2017), and a model to explain the concentration of Airbnb accommodation in the centers of the city has been proposed (Benítez-Aurioles, 2018b).

Stylized fact proposal 7. The farther away accommodation offered through Airbnb is located from the center of the city, the lower its price is.

II.6.3 Host attributes

The importance of *host attributes* is to a large extent a unique feature of peer-to-peer markets. A comparative analysis of online reviews put forward that guests underscore their relationship with hosts in peer-to-peer markets; while for hotel rooms, their attention was mostly brought to room attributes (Belarmino *et al.*, 2019). Airbnb awards the superhost distinctive to those that, on average, have obtained a general rating of no less than 4.8 stars; answer at least to 90% of messages within a maximum of 24 hours; get at least 10 visits per year; and only cancel bookings in exceptional circumstances (Airbnb, 2020j). According to Wang and Nicolau (2017), among listings that had received at least one review, around 8% were owned by superhosts. Of all these criteria, using data on Airbnb listings from San Francisco and the Bay Area, Gunter (2018) concluded that obtaining excellent ratings is, by far, the most important. Anyway, reviewing the literature, we find numerous references showing that there is a positive association between accommodation prices and superhost ownership. At this point, we could ask whether the efforts invested by hosts to obtain (and keep) that distinction are compensated by the higher income derived from the increased willingness to pay of guests (Liang *et al.*, 2017). In this sense, according to internal Airbnb data that compares the average income obtained throughout 2017 by superhosts all across the world, to that of other hosts (with more than 10 bookings), superhosts earn 22% more (Airbnb, 2020j).

Stylized fact proposal 8. Hosts with the label "Superhost" offer accommodation with higher prices.

Another attribute that, according to the available empirical evidence, influences the price is the degree of host professionalization. In theory, everyone in the peer-to-peer market should be an individual with no linkage whatsoever to the tourism business. But, in reality, there are some hosts that act as intermediaries between the owner and the guest,

and are advertising several listings at once. Typically, studies refer to hosts as *professional* as soon as they own more than one listing. Table II.2 indicates that the majority of analysis on the price determinants of Airbnb accommodation find a positive relationship between the number of listings offered and prices; though we know about one where the relationship is of the opposite sign, Teubner *et al.* (2017). In any case, it has been shown that professional hosts are able to adapt their prices in a more efficient manner when facing demand fluctuations (Li *et al.*, 2016). We should point out here that Airbnb provides a tool to hosts that allow them, according to its explanation, to make prices go up or down based on changes in demand and accounting for the type and geographical situation of the home, among other factors (Airbnb, 2020k). The truth is that pricing tools are ceasing to be a firm-exclusive instrument and starting to be accessible to any individual supplier such as those operating in the peer-to-peer market. At present, besides Airbnb's, we can find several services in the market (Everbooked, Beyond Pricing, Wheelhouse, Pricelabs, etc) that use data mining, through different algorithms, with the goal of suggesting optimal prices to the accommodations that are going to be offered through the peer-to-peer market.

Stylized fact proposal 9. Professional hosts offer accommodation with higher prices.

Finally, seniority and/or host's experience has a positive, statistically significant influence on price, as listed in Table II.2. In other words, hosts who have been offering accommodation on Airbnb for longer seem to have learned through experience in a way that lets them set higher prices.

Stylized fact proposal 10. Hosts that have been longer in the Airbnb platform charge more expensive prices.

II.6.4 Reviews and rating

The number of reviews has repeatedly proven to be negatively related to price. In Ert *et al.*'s (2016) study—the only exception in Table II.2—this relationship was positive, albeit not statistically significant. Perhaps, the most elementary explanation that has been put forward is that listings with lower prices attract more guests, and therefore, get more reviews. Put differently, it is a mere expression of the law of demand. This should be accounted for by the inclusion of reviews as another control variable, but the problem of

endogeneity is not as easily solved and we are not aware of any study to date that has dealt with this problem in the market for peer-to-peer tourist accommodation. Another possible explanation that has been discussed is related to potential review manipulation: a high number of reviews might suggest review manipulation, and hence guests' willingness-to-pay may fall and hence, force hosts to lower their prices (Magno *et al.*, 2018b).

Stylized fact proposal 11. The number of reviews and price of Airbnb accommodation are negatively associated.

Conversely, most of the analyzes establish a positive relationship between overall rating and prices, although in one case the opposite effect has been detected. To explain it, Zhang *et al.* (2017) speculate with the possibility that the guests have lower expectations when the accommodation has a low price and, hence, are easier to satisfy, and thus more likely to leave a high rating. However, this is the exception that confirms the rule that highest ratings tend to be associated to accommodations with higher prices. Some studies also include disaggregations of ratings by distinct items. Most results find a direct relationship between price and the cleanliness and location ratings, and inverse one with the value rating—which makes sense considering that the latter measures the opinion of guests on the price-to-quality ratio. Regarding the rest of the items (accuracy, communication and check-in ratings), no dominant, statistically significant relationship was found.

Stylized fact proposal 12. Accommodation with higher ratings is more expensive.

II.6.5 Booking

Regarding the booking policy, most of the studies find a negative relationship between price and the instant booking option. Only Benítez-Aurioles (2017) for the Barcelona found a positive relationship. However, it should be noted that this same author conducted a more complete and specific study on the relationship between Airbnb's cancellation policies and prices, and obtained that, in most of the cities analyzed (there were 44), the relationship between the instant booking option and prices was negative; although in some large European cities (Amsterdam, Berlin, Paris and Rome) it was of

the opposite sign—the parameter of Barcelona did not turn out statistically significant this time (Benítez-Aurioles, 2018a). In turn, the relationship between price and the flexible cancellation policy—i.e. when the booking can be fully refunded if cancellation is done no later than 24 hours before arrival—showed up as negative in all cases (except in Trentino, Italy, where the parameter was non-significant). Wang and Nicolau (2017) pointed out that the relationship between price and flexible cancellation policies was influenced by emotional factors, arguing that hosts would not care as much for their own income security as for the desire to offer a fair price to their guests. Despite that, Benítez-Aurioles (2018a) presented an analytical model that showed that setting a flexible cancellation and low prices could actually be part of a rational strategy, assuming that hosts are monetary profit-maximizers. On that basis, it was concluded that the functioning of the peer-to-peer markets—and, in particular, the vectors that determine supply—are not much different from those governing traditional markets. Another interesting datum is that, despite small variations across cities, approximately one in four hosts activates the instant booking option; and one in three hosts allows for flexible cancellation (Benítez-Aurioles, 2018a).

Stylized fact proposal 13. Accommodation with the instant book option is cheaper.

II.6.6 Amenities

Table II.2 lists some amenities whose relation with price has been studied. Some findings are trivial—for instance, that the provision of parking or swimming pool has a positive effect on price. Actually, the same relationship was also found for hotels (Espinet *et al.*, 2003; Hartman, 1989; Thrane, 2007, Lee & Jang, 2012) and for private accommodation (Portoland, 2013). Others, however, deserve some additional comment. For example, in one case, breakfast provision was negatively related to the price (Wang & Nicolau, 2017). This relationship is consistent with that of earlier findings in the hospitality industry (Carvell & Herrin, 1990; Lee & Jang, 2011; White & Mulligan, 2002); although here some cases of a positive, significant relationship between hotel price and breakfast provision have been evidenced too (Yang *et al.*, 2016). The attempt to make the accommodation attractive by offering an additional service could be understood, similarly to the case of flexible cancellation policy, as a strategy by hosts to maximize their profit.

As for the "smoking allowed" option, as shown in Table II.2, there are two studies that find a negative relationship with price. This is in line with the work of Kennedy *et al.* (2018) which, using Canada as a reference, evidenced that Airbnb accommodation that allows smoking can be significantly less expensive than smoke-free options in certain markets. To explain this relationship, one could think that, perhaps, the host tries to compensate the lesser quality of his/her accommodation by offering this amenity, which makes it more attractive to smoking guests. Anyhow, there is ground for regulation here due to health considerations.

Finally, it has been discovered that the provision of Wi-Fi also positively affects the price of the accommodation. Nevertheless, Schamel (2012), with data collected in 2010 and referred to hotels in the Italian city of Bolzano, showed that the provision of Internet access had a negligible impact on prices—likely because it was already considered a standard attribute, not worth to be paid for. This might be a more general trend affecting Airbnb too: of the more than 180,000 listings analyzed by Wang and Nicolau (2017), 90% had Wi-Fi. And, in the newest study available, referring to Vienna with data from January 2017, no statistically significant relationship was found between the price and the Wi-Fi provision (Teubner *et al.*, 2017).

Stylized fact proposal 14. Breakfast, pool, parking and Wi-Fi are amenities that tend to elevate the price of accommodation; while the smoking allowed option diminishes it.

II.7. Impacts

Over time, research on peer-to-peer tourist accommodation market has become increasingly focused on the impact of its growth on different areas. Cheng (2016) made a review of papers published between 2010 and 2015 and highlighted, especially for tourism and hospitality, how much attention was paid to the impact on tourist destinations and services, and on tourists themselves. More recently, we can find analyses on the impacts, not only in the traditional industry, but in other markets, like housing, that are affected by the supply of tourist rental accommodation. Putting effort to empirically contrast what, in principle, were simple conjectures is particularly important. Perhaps the most widespread belief is that the arrival of Airbnb had a negative impact on hotel

revenues, reduced unemployment and increased household income (Mao *et al.*, 2018). However, as we will have occasion to verify, the results of research carried out up to now admit nuances in that statement.

II.7.1 Hotels

Even though the effects of such platforms on the tourism industry, especially on hotels, have much been speculated since the beginning (Guttentag, 2015; Sigala, 2017) only very recently has analytical and empirical evidence on this subject been provided.

At a theoretical level, Einav *et al.* (2016) presented a model that distinguishes professional suppliers (hotels) from flexible ones. The professional supplier incurs an initial sunk cost to set up its productive capacity, while the flexible supplier does not and can only produce one unit; still, both pay a marginal cost per unit produced and a fixed advertising cost to make themselves visible to buyers. Both compete for variable demand. Flexible suppliers enter the market when their marginal costs are relatively low and/or when professional suppliers' sunk capacity cost is relatively high. Assuming perfect competition, profits will be driven to zero so that there is no incentive to either join or quit the market. The model has an original addition: the costs of the platform per seller fall as the number of sellers in the platform grow; therefore, flexible sellers benefit from their own growth. The final outcome is that, while the production capacity of nonflexible suppliers remains constant, that of flexible suppliers may grow up to a new equilibrium.

From an empirical perspective, the first work that rigorously addressed the impact of Airbnb in the hotel industry, to our knowledge, is that of Zervas *et al.* (2017). These authors handled a database containing information on more than 13,395 listings spanning a period from January 2008 to August 2014, in Austin (Texas). Their analysis concluded that the negative impact on hotel income ranged between 8 and 10%, but was not uniformly distributed, as lower-end hotels and hotels not catering to business travelers were the most affected by Airbnb's competition. Afterwards, some work has been done out in the form of master's theses that have taken the work of Zervas *et al.* (2017) as a reference. For example, Neeser (2015) found an insignificant effect of Airbnb on hotel income in the Nordic countries (Norway, Finland, and Sweden); but his estimates were aggregated without considering the possible effect on individual hotels. And, as noted the author, if Airbnb harms cheaper hotels to the point that they are forced to leave the market,

then the net effect on average income could be biased upwards. Nevertheless, Ytreberg (2016), based on a panel data set consisting of monthly hotel data and the number of Airbnb listings in five of the largest Norwegian cities, found that a 10% increase in Airbnb supply decreases hotel revenue by 0.3% and that, in line with the results of Zervas *et al.* (2017), hotels operating in the low and medium price segment are most affected. Finally, to make evident the diversity of results obtained, we should include the work of Mohamad (2016) that concludes from a sample of Toronto hotels divided in six categories that midscale class hotels are the only ones statistically significantly negatively impacted by Airbnb growth. The impact is statistically insignificant on the number of luxury, upper upscale, and economy class hotel; whereas upscale and upper midscale class hotels are positively impacted.

Stylized fact proposal 15. Airbnb supply affects hotel income negatively, although with an uneven impact that varies with hotels' category.

From a qualitative angle, surveys have also tried to value the impact of Airbnb on hotels. Koh and King (2017) surveyed 10 representatives of Singapore hotels and hostels, and concluded that, even if Airbnb does not pose a threat to budget hotels in the short term, it could in the middle term. Likewise, Guttentag and Smith (2017) interviewed 800 tourists and found that two-thirds had used Airbnb as a hotel substitute, and mainly for budget hotels or motels. Finally, Varma *et al.* (2017) interviewed both hotel executives and customers of Airbnb and traditional hotels to conclude that there are important differences in the type and motivation of consumers that book in Airbnb and those who do in hotels; and that, even though smaller and mid-range hotels contemplate possible adjustments to face Airbnb's competition, the major players in the hospitality industry do not consider it a threat.

Accordingly, the relationship between the traditional market for accommodation and the peer-to-peer one is more complex and nuanced than it appears. Along these lines, we have the work of Heo *et al.* (2019) for the case of Paris. These authors suggest that the impact of Airbnb may vary depending on the hotel market, and that the possible complementarity between both markets should be explored, as Airbnb offers possibilities to travelers that would not otherwise be so. It has even been suggested to offer joint packages between

Airbnb and traditional lodgings to make possible the stay in both (Johnson & Neuhofer, 2017).

Therefore, even though it has been stated that that Airbnb "is bad for hotels but good for tourism" (Oskam & Boswijk, 2016), the overall result of available empirical evidence does support the first half of that claim.

II.7.2 Employment and income

Airbnb appears as an opportunity to make money for those who choose to become hosts (Airbnb, 2020l). It also creates entrepreneurial opportunities for service provision to hosts themselves, which can range from basic cleaning or home care to the integral management of the accommodation rental (Sigala & Dolnicar, 2018). This, in turn, can increase the demand for work, both low-skilled and specialized; and can allow the incorporation into the labor market of those who only desire sporadic employment (Forgacs & Dolnicar, 2018). The resulting outcome on local income and employment will of course depend not on the income and employment, directly, attributable to Airbnb and, indirectly, to its potentially induced tourism growth; but also on the crowding-out of the traditional lodging industry. In this direction, Fang *et al.* (2016), analyzed county-level annual tourism employment data for the period of 2009-2013 from Idaho (USA) (220 observations in total) and detected a positive relationship between the increase in listings and employment. This finding led them to suggest that Airbnb had benefited the entire tourism industry due to the increase in the number of tourists caused by cheaper accommodation supply. More recently, Mao *et al.* (2018), with a sample that included 32,048 listings in 451 counties of 51 states in the United States, spanning a period from 2008 to 2015, concluded that an increment of 10% in Airbnb's listings was associated to a 0.4% increase in employment. Similarly, they detected an increase of the payroll per employee and of the local household income.

Stylized fact proposal 16. The development of peer-to-peer markets for tourist accommodation has contributed to the growth of income and employment.

Regarding the distributional effects, studies are even scarcer. Mao *et al.* (2018) suggest that Airbnb may be mainly favoring end jobs that do not require a sophisticated skill; and

Schor (2017), based on 43 providers from various platforms—among which Airbnb—states that these platforms are contributing to income inequality at the bottom 80% of the distribution. Still, we are certainly in need of more robust distributional studies to confirm these claims and to learn about the true impact of Airbnb on income distribution.

II.7.3 Housing market

The impact that Airbnb is having on the housing market is an exceptionally controversial issue that has encouraged a few pressure groups to commission reports to consultancy firms (EY, 2015; InAtlas, 2017; Levendis & Dicle 2016; Red2Red, 2017; Tenant's Union of New South Wales, 2017). The quality of their results, naturally, has not been through academic filters. Actually, research on this subject is in its infancy; but it has already yielded remarkable results. Here, it is worth to mention the descriptive work of Lee (2016), whose title reflect its content—*How Airbnb Short-Term Rentals Exacerbate Los Angeles's Affordable Housing Crisis*; as well as other working papers that, even though they differ in terms of methodology and temporal and special scopes, agree in that the arrival of Airbnb caused an increase in housing prices and rents in the affected areas (Barron *et al.*, 2018; Elíasson & Ragnarsson, 2018; Segú, 2018; Sheppard & Udell, 2016). However, other contributions bring some qualifications. On the one hand, Coyle and Yeung (2016) estimated that the arrival of Airbnb was positively correlated with a house rental index in London but not in Berlin, and a joint analysis of both cities resulted in a negligible correlation. On the other hand, Coles *et al.* (2017), with New York City data, maintained that short-term rentals do not appear to be as profitable, relative to long-term rentals, as many assume; which, to a certain extent, questions the power of the incentive to move houses from the conventional market to the tourist market.

In any case, as far as we are concerned, the research of Horn and Merante (2017) was the first rigorous empirical research on the effects of Airbnb in the housing market that has overcome the filters of a quality academic journal. In this case, results would confirm that, at least for the case of Boston, Airbnb's activity would have caused a reduction in the supply of housing available for potential residents and, consequently, an increase in rents.

Stylized fact proposal 17. The emergence of Airbnb favors the increase in the price of conventional (long-term) rents and of housing.

Related to high housing costs, we come across the subject of gentrification. Originally, this concept was used in the middle of the sixties to describe the transformation of some neighborhoods in London in which the working class was displaced by the middle class (Glass, 1964). Subsequently, the expression *tourism gentrification* was proposed to describe the process that took place in New Orleans through which a middle-class neighborhood becomes an exclusive enclave marked by the proliferation of tourist attractions (Gotham, 2005). More recently, the term *touristification* has been used (Freytag & Bauder, 2018), or even *Airbnbization* (Richards, 2017) with a pejorative nuance, to refer to the process of transformation that cities have experienced with the expansion of Airbnb. Thus, Ioannides *et al.* (2018) studied the case of Utrecht and detected hints that Airbnb played an "instigator" role in the greater touristification of some parts of the city. At this point, the debate on the impact of Airbnb on urban development and the potential imbalances that it could be fostering is still open (Wachsmuth & Weisler, 2018)

II.7.4 External effects

Besides the aforementioned impacts, Airbnb supply growth is causing a series of both positive and negative externalities. Even though they are hard to quantify because of their nature, it is necessary to incorporate them into the discussion. The positives externalities, highlighted by the company itself (Airbnb, 2020m), include the smaller impact on the environment with respect to hotel tourism. In July 2017, Juvan *et al.* (2018) identified the characteristics of the most frequently rented Airbnb properties in various European cities. Their conclusions confirm the lesser environmental impact of Airbnb-traded accommodation because, among other things, they are formed by existing dwellings and are equipped with infrastructure that favors environment-friendly practices such as waste recycling.

Stylized fact proposal 18. Accommodation in the peer-to-peer market have a smaller environmental impact than conventional accommodation.

External effects, on the contrary, are associated with disturbances, noise, congestion, public service saturation, etc. Gurran and Phibbs (2017) compiled the conclusions of different reports prepared by the local governments of New South Wales and observed that all of them pointed out that the penetration of Airbnb in residential areas had caused disturbance, traffic jams and parking problems, as well as difficulties in waste management. These kinds of problems have been an additional reason for public administrations to choose to intervene in the short-term tourist rental market.

Stylized fact proposal 19. The expansion of Airbnb supply generates negative external effects on cities.

II.8. Regulation

The scarcity of housing, the raise in price, the fall in living standards and unfair competition are a few of the problems caused by high Airbnb accommodation demand on the local population of many cities, and are a challenge to public administrations (Hajibaba & Dolnicar, 2018c). This situation has pushed various legislative responses at different levels (national, regional and local).

The spread of regulations on the usage of touristic housing has created widely different legislative environment not only across but also within countries, since many regional governments and city councils are using their competences to establish their own rules. For instance, within the EU, we appreciate large differences in fiscal treatment and prerequisites for market access (European Commission, 2018). As for intra-country differences, the case of Spain is a good example. Regions have broad competences to regulate the tourism sector, which have been used to establish different series of requisites regarding issues such as equipment, days of stay, administrative registries, or even the prohibition of subletting homes by rooms, which has been criticized by independent competition-regulating agencies (CNMC, 2018).

Apart from normative recommendations that some authors (Lee, 2016) have made, analyses have been engaged, basically, in characterizing the differences between existing legislative frameworks and determining their effects. In this way, Nieuwland and Van Melik (2018) studied the regulation of 11 European and North American cities and

distinguished three kinds: those that attempt to alleviate the pressure of tourism through the partial or total prohibition of Airbnb (Barcelona, Anaheim and New Orleans); those that aim to guarantee affordable housing by blocking entire home offers in the platform or limiting the number of nights that one can stay in one of their properties (Berlin, San Francisco, London, New York and Santa Monica); and those that just try to preserve the lifestyle of residents by making hosts only able to offer accommodation in their primary residence and limiting the number of nights as well (Amsterdam, Denver and Paris). The diversity of regulations suggests, at least for the case of USA, that some harmonization might be convenient (Interian, 2016).

Stylized fact proposal 20. Local authorities have implemented widely different regulations on the peer-to-peer market for tourist accommodation.

As for their effects, it has been pointed out that the relatively low proportions of entire properties and year-round offers in several large cities is explained by the efficacy of regulations (Adamiak, 2018). From a different perspective, it has been suggested that regulation could help mitigate asymmetric information problem by imposing quality standards on supply and getting rid of "bad apples" in the platform (Yuxin *et al.*, 2018).

In sum, with the case of Airbnb, the old economic policy debate on the role of regulation in the market's functioning finds a new field of application. While at the academic level further research and data evidence are needed to determine with rigor the causes and effects of Airbnb's exponential development, politicians are pressured by the affected interest groups to find solutions and take action. The years to come will likely dispel uncertainty on the most appropriate regulatory framework to make all of the interests at stake compatible.

II.9. Concluding remarks

Figures II.1 and II.2 contain a diagram of the stylized facts and relations that have been presented in this chapter.

Figure II.1. Stylized facts and relationships (outside Airbnb prices).

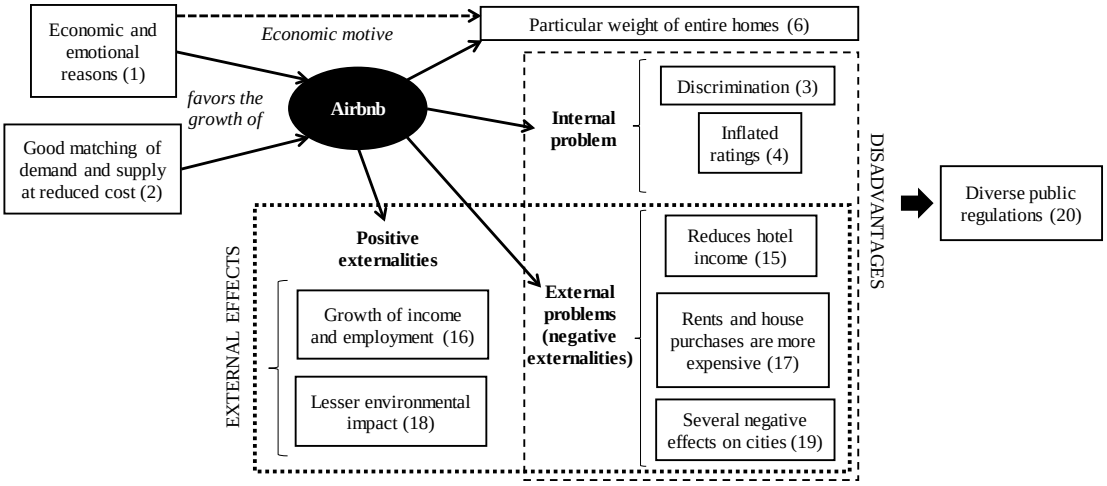
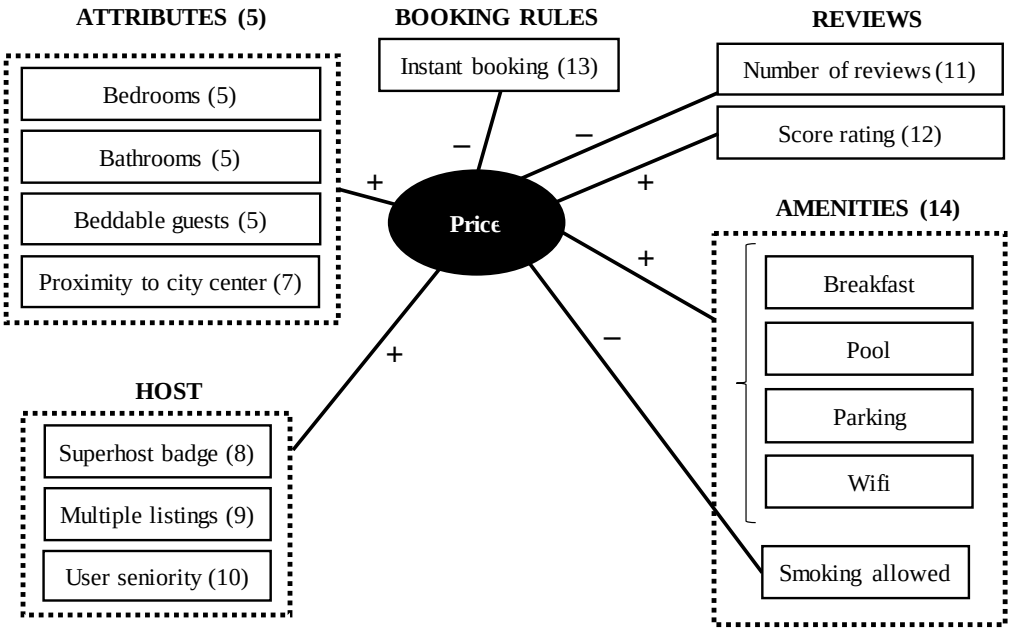


Figure II.2. Stylized facts and relationships (in relation to Airbnb prices).



We highlight that the lines of research open around peer-to-peer markets for tourist accommodation have different degrees of maturity. Some seem exhausted, or are just framed within a broader conceptual discussion on the sharing economy. It is clear that, apart from the promotion of humanitarian activities (Airbnb, 2020n), that could be understood as part of the company's corporate social responsibility, Airbnb's profit-making motive is what earns it a place among the top 500 most valuable brands in the world (Brand Finance, 2018). At the same time, there are enough contributions proving repeatedly, through questionnaires, that hosts and guests use Airbnb for both social and

economic motives. Therefore, further research confirming what is already known on that subject may prove irrelevant.

Analyses on the so-called two-side markets, although long-established, have found in peer-to-peer markets for tourist accommodation a new opportunity to validate consolidated theses. Analyses confirmed that Airbnb has the characteristics, already described for other Internet-operating platforms, to facilitate a large-scale meeting of demand and supply. The goal in those kind of markets is to maximize the number of matches thanks to significantly reduced costs of information, search and transaction. Thus, the way in which supply is presented has proven relevant to explain consumer decisions. Even though the exact algorithm used by Airbnb to sort its supply is unknown, we do know its interest in promoting instant book accommodations; which, to a certain extent, might collide with the interests of hosts wishing to know their guests' characteristics prior to admitting them into their homes.

In principle, the instant book option may contribute to palliate potential discrimination that could be exerted by the hosts on their guests. About this, early research using observed accommodation prices and various experiments, found that certain group of hosts undercharged for their accommodation, and that certain guest characteristics, such as those associated with race or sexual orientation, influence the chances of being accepted. That said, there is also evidence that, once a minimal amount of additional information on the potential guests' behavior is revealed via one simple review, race does no longer hold any significance on hosts' decisions. This last finding might be compatible with the perception that hosts usually care more about getting their home booked than about discriminating, and that when a request is declined, it is done with risk minimization in mind and not for the personal characteristics of the demander. In any case, research findings do not allow, for now, a conclusive statement; maybe, because in reality, it is a complex problem that is not solved with market efficiency-improving proposals but with political action to alter the preferences of agents in these markets.

Another common issue to all peer-to-peer markets, that is well illustrated in Airbnb, is the setting of reputation mechanisms to enforce the level of confidence needed to close transactions. It is a stylized fact that, on the one hand, the number of reviews is concentrated in a small part of supply which suggest that so is demand and, on the other, that ratings are upwardly biased. To explain demand concentration, evidence has

suggested a herding-type behavior from users; and for inflated ratings, one of the reasons put forward has been the lack of incentives to make negative valuations. The possibility of rating manipulation has been documented for hotels but, to our knowledge, no evidence has been contributed to the case of Airbnb. At a more general level, studies on reputation mechanisms designed for peer-to-peer markets for tourist accommodation are scarce, and results found so far need to be retested in the future. There is considerable scope for further investigation in this area.

With regards to the factors determining prices of the accommodation in peer-to-peer market, albeit relatively scarce in comparison to studies made for the case of hotel rooms, they coincide in a series of results that could be referred to as empirical regularities. First, price seems positively related with those home attributes that are indicative of size (number of bedrooms, bathrooms, accommodates) or privacy (entire homes as more expensive than private or shared rooms). Certain host attributes (superhost qualification, experience or professionalization) are also correlated with accommodation prices. Prices move in the same direction with ratings or the availability of certain amenities in the accommodations (parking, pool, Wi-Fi). Conversely, price typically appears negatively related with accommodation distance to the center of the city, to the number of reviews, and to the options of instant booking and smoking allowed. Some of these relationships are obvious and predictable while others have called for additional explanations that, in any case, are still compatible with economic models based on rational and profit-maximizing agents. This line of research may be developed using other techniques that complement those based in hedonic pricing, although it is likely that results will not be very different, given that the consistency that studies have shown until now.

A field in which there is a gap between, on the one side, social and political interests, and, on the other, available studies up to now, is that of the impacts that Airbnb is causing. In addition to that, in sometimes the soundness of developments in the academic field does not back up simple, categorical claims. In the first place, research has proven that impacts on hotels cannot be generalized, as they do not always compete for the same demand. Secondly, the first contributions indicate that the effects of the arrival of Airbnb on income and employment may have been positive; although there is still little evidence on how they have been distributed. Thirdly, everything suggest that Airbnb's presence might be affecting house prices and long-term rents in cities; albeit the scarcity of studies about it calls for caution. Finally, about the alleged positive (environmental) and negative (local

welfare) externalities, we only have a few hints that are yet to be confirmed. Irrespective of the foregoing, public administrations have been promoting legislation that, with different goals and degrees of intensity, aim to regulate activity in the peer-to-peer market, and therefore, Airbnb. The problem is that final results on the impact of Airbnb are not yet available, and often, regulators only have intuitions or conjectures to back up their decisions.

III. RECENT TRENDS IN THE PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION

Abstract

The aim of this article is to identify recent trends that are configuring the peer-to-peer market for tourist accommodation. Data comes from scrapings of active listings in the Airbnb platform in early 2016 and 2019, in 10 cities of the world. On that basis, it is observed, among other things, the growth of the market, the predominance of entire homes, the professionalization of hosts, and a booking policy in which flexible cancellation loses weight and instant booking gains protagonism. Some useful considerations for policy actions are noted.

(In Review)

IV. GIVING A CHANCE TO NEW ENTRANTS IN THE PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION

Abstract

A significant reason for the concentration of demand in a subset of the supply in the peer-to-peer market for tourist accommodation is herding behavior, by which the decisions of the first guests are imitated by those who follow. This paper proposes a profit- and utility-maximization microeconomic model and implements it with data of Airbnb listings corresponding to 10 European cities. Results show that the influence of each additional review is positive but decreasing, inducing a more balanced distribution of demand among offered accommodation, and thus dampening the herding effect. Moreover, reservation policy— specifically, enabling the instant booking option—is key to explain the initial push that accommodations need to be demanded now, and hence, to increase their possibilities of being demanded in the future.

(In Review)

V. CONCENTRATION IN PEER-TO-PEER MARKET FOR ACCOMMODATION

Abstract

Purpose. We explore whether peer-to-peer accommodation prices are influenced not only by product differentiation or hosts' reputation, but also by the market power granted by the concentration of supply.
Design/methodology/approach. For that aim, we develop a model for the effect of concentration on Airbnb prices and apply multilevel analysis to data from 530,888 listings in 60 world cities.
Findings. Controlling for various characteristics, our findings indicate that hosts owning more listings tend to set higher prices. Moreover, cities where listings are highly concentrated in few hosts do not significantly have higher prices.
Originality. The model and strategy are novel and the results affect the scale at which practical policy considerations on the peer-to-peer accommodation market is to be considered.

(In Review)

VI. IS AIRBNB BAD FOR HOTELS?

Abstract

Available empirical evidence on the effect of Airbnb's expansion on hoteles in tourist destinations is mixed. With monthly data from the city of Barcelona between August 2010 and October 2018, we have noted that, following our estimation, the growth of the peer-to-peer market for tourist accommodation has negatively affected hotels 'occupancy and performance, independently of their category.

Benítez-Aurioles, B. (2019). Is Airbnb bad for hotels? Current Issues in Tourism. DOI: 10.1080/13683500.2019.1646226

VII. THE IMPACT OF AIRBNB PRESENCE IN THE HOUSING MARKET

Abstract

Based on a microeconometic model, this paper examines the effect of Airbnb in rents and house prices. Using borough-level data from the city of London between 2016 and 2019, we estimate System GMM regression models that indicate that Airbnb presence has an upward effect on the prices of both house purchases and of rentals, even disaggregating by categories; but the effect is stronger on house prices than rents, as theorized by the model. This evidence confirms that Airbnb affects the housing market by increasing the value of real estate properties.

(In Review)

VIII. A PROPOSAL FOR REGULATION

Abstract

The emergence of platforms that use the Internet to facilitate the meeting of demand and private supply has enabled individual owners to offer their home to potential guests around the world. The disappearance of entry barriers that used to protect incumbents in the traditional industry, together with a drastic reduction in information and search costs, has led to exponential growth in the peer-to-peer market of accommodation. The data shows that demand, on the one hand, is concentrated in a few accommodations and that, on the other, is unequally distributed in space. In particular, the demand is oriented to the center of the cities, generating impacts in different areas, which has opened a social and political debate on their regulation. Thus, this article presents an alternative proposal to the regulatory reactions that, from different levels of public administration, have occurred up to now. Specifically, on the basis of a model on the concept of both *contamination* and *public resources* externalities, we discuss the implementation of "transferable sharing rights" (TSR) for the regulation of rentals in the short term.

Benítez-Aurioles, B. (2020) A proposal to regulate the peer-to-peer market for tourist accommodation. International Journal of Tourism Research. DOI: 10.1002/jtr.239

IX. BARCELONA'S PEER-TO-PEER TOURIST ACCOMMODATION MARKET IN TURBULENT TIMES: TERRORISM AND POLITICAL UNCERTAINTY

Abstract

Purpose – The purpose of this paper is to assess the impact of sociopolitical instability on the peer-to-peer market for tourist accommodation. *Design/methodology/approach* – The author studies for the case of Barcelona the impacts of the events occurring in the past months of 2017, which consisted of a terrorist attack and the calling for a referendum on the independence of Catalonia, by fitting a fixed effects regression model to a data panel of Airbnb listings, using New York and Paris as a control group. *Findings* – The results show that, after controlling for individual and time effects, listing reviews and revenues fall in the last quarter of 2017 and do not recover until the second quarter of the next year, in spite of a notable effort to decrease prices in the same period. They also indicate that peer-to-peer hosts react fast to demand shocks and as those from traditional markets. *Originality/value* – This is the first study to evaluate the impact of terrorism or political uncertainty in the peer-to-peermarket and the first to evaluate their combined effect in any market.

Benítez-Aurioles, B. (2019). Barcelona's peer-to-peer tourist accommodation market in turbulent times. International Journal of Contemporary Hospitality Management, 31(12), 4419-4437

X. SEASONALITY AND MARKETING IN THE PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION. ON THE CASE OF MALLORCA

Abstarct

Seasonability constitutes one of the recurring problems of sun and beach destinations and is still a challenge to managers of both public and private spheres, especially in the area of tourist marketing. This article contributes evidence to back up the hypothesis that seasonality in the p2p market for tourist accommodation is smaller than that existing in conventional markets, taking as a reference the case of Majorca. Furthermore, within the p2p market, the variability of demand is appreciably smaller in Palma, the island's capital, than in the rest of the municipalities. This suggests that tourism demand's seasonality in urban centers is even smaller. Moreover, it has been noted that a high percentage of hosts knows basic marketing techniques related to the price and promotion of the product. The awareness of this reality implies the possibility of using the p2p market as a tool to reduce seasonality

(In Review).

XI. IMPACTS OF THE PEER-TO-PEER MARKET ON TOURIST ACCOMMODATION ON THE BALEARIC ISLANDS OF MALLORCA AND MENORCA

Abstract

Using the Balearic Islands of Mallorca and Menorca as case studies, this research identifies the patterns of development in the peer-to-peer market for tourist accommodation in the islands. Characteristics of this market include the predominance of the supply of entire homes and the concentration of demand in a few accommodations, as well as the remarkable unequal spatial distribution in the existing urban structure and the aggravation of problems related to seasonality. Nevertheless, the different degree of maturity of each market differs in the two cases. The results show hotel occupancy suffers from the intensification of tourist housing, independent of hotel category, or of the growth of demand in the peer-to-peer market, while tourism employment increases. These results suggest the impacts are evident beyond some threshold of tourism market development

Benítez-Aurioles, B. (2020). Impacts of the peer-to-peer market on tourist accommodation on the Balearic Islands of Mallorca and Menorca. Island Studies Journal. DOI: 10.24043/isj.108.

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XII. THE PEER-TO-PEER MARKET FOR TOURIST ACCOMMODATION IN LATIN AMERICA

Abstract

Purpose Providing empirical evidence on the functioning of the p2p market for tourist accommodation in four Latin American cities, comparing results and highlighting peculiarities with regards to consolidated tourist destinations. *Design/methodology/approach* Data comes from scrapings made in mid-March 2019 of the listings on the Airbnb platform for the cities of Buenos Aires (Argentina), Mexico City (Mexico), Rio de Janeiro (Brazil) and Santiago (Chile) that are among the most visited in the world. The theoretical approach comes from economic analysis and is implemented with statistical and econometric techniques and a hedonic regression model to identify the variables that determine the supply, demand and prices of accommodation. *Findings* The p2p market in Latin America has a wide margin to continue growing and to configure itself as a professional market for the rental of entire homes in the short term. There is high concentration of demand in a few accommodations. Hosts are not exploiting the full capacity to efficiently manage their accommodation prices. All this suggests that, in emerging markets, unlike in mature tourist destinations, the incorporation of specific elements, such as those related to equity and the distribution of added value, is pertinent in a global framework for the valuation of the social welfare generated by trade made through Airbnb. *Research limitations/implications* The fact that the number of reviews has been used as a proxy is a limitation and adds a provisional character to our results and encourages the replication of our analysis with data on the effective occupation of the accommodation, to which we did not have access to in our case. *Practical implications* The differences detected in price formation in four Latin American cities with respect to consolidated destinations suggest that, in certain regions, hosts are not taking full advantage of the potential of the market, which might be an opportunity for the proposal of programs improving the management capacity of individual owners. Social implications If the priority is a more equalitarian distribution of income that is brought by tourist rentals to local hosts, a system that allocates permits according to the criteria reflected by social preferences could be tested. *Originality/value* This research represents the first analysis of the peer-to-peer market for tourist accommodation that takes as a reference several Latin American cities, with theoretical and practical implications that could be extended to other emerging markets.

(In Review)

XIII. CONCLUSIONS

XIII.1 Introduction

As a general rule, we have included a conclusions section at the end of previous chapters. Therefore, we will avoid repeating arguments and results already presented inasmuch as possible. Still, in this final chapter we will highlight the key findings, the main political implications, contributions, limitations and future lines of research. We end with some considerations about the work that we have accomplished.

XIII.2 Key Findings

This section summarizes our key findings. In essence, these are the answers that we have found to the research questions that were posed in the introductory chapter, and that were developed in the following ones:

Key Finding 1: Literature on the p2p market for tourist accommodation has reached a critical mass for us to draw some stylized facts: 1) Hosts and guests join the peer-to-peer market for tourist accommodation for both economic and emotional reasons; 2) One of the reasons explaining Airbnb's exponential growth is its capacity to match hosts with guests' demand at a reduced cost; 3) The access to information on personal characteristics of hosts and guests gives way to discrimination in the peer-to-peer market for tourist accommodation; 4) Airbnb ratings are biased upwards; 5) The number of bedrooms, bathrooms or of guests that can be hosted in an accommodation increases price; 6) The weight of entire homes in Airbnb's supply is predominant and growing; 7) The farther away accommodation offered through Airbnb is located from the center of the city, the lower its price is; 8) Hosts with the "Superhost" label offer accommodation with higher prices; 9) Professional hosts offer accommodation with higher prices; 10) Hosts that have been longer in the Airbnb platform charge more expensive prices; 11) The number of reviews and price of Airbnb accommodation are negatively associated; 12) Accommodation with higher ratings is more expensive; 13) Accommodation with the instant book option is cheaper; 14) Breakfast, pool, parking and Wi-Fi are amenities that tend to elevate the price of accommodation; while the smoking allowed option diminishes it; 15) Airbnb supply affects hotel income negatively, but with an uneven impact that varies with hotels' category; 16) The development of peer-to-peer markets for tourist accommodation has contributed to the growth of income and employment; 17) The emergence of Airbnb favors the increase in the price of conventional (long-term) rents

and of housing; 18) Accommodation in the peer-to-peer market has a smaller environmental impact than conventional accommodation; 19) The expansion of Airbnb supply generates negative externalities on cities; 20) Local authorities have implemented widely different regulations on the peer-to-peer market for tourist accommodation.

These stylized fact proposals are a consequence of the review of the literature carried out in Chapter II. Our objective was to determine, through available empirical evidence, what we have learned on the p2p market for tourist accommodation. Multiple destinations—more than 60 cities—around the world have protagonized our analysis. Although it is certainly true that the behavior of destinations that are within the same geographical grouping tends to be more similar (such as American versus European cities in terms of the effect of concentration on prices; or seasonality and hotel impacts in Mallorca--a mature destination-- compared to Menorca, or the effect of distance from the center in certain Latin America with respect to the biggest metropolises in the rest of the world), other features of this market are universal. In general, the direction and magnitude of relationships and impacts will depend on tourism market maturity, size, geography, and social and political climate towards p2p accommodation, among other peculiarities. But it has still been possible to draw a series of stylized facts, and we believe that results found in the cities of our study can be generalized to other locations as long as some of their broader features are common.

The analysis of the contributions made allowed us to discover that many lines of research have already been opened. Some have brought to light consistent results to the point of seeming exhausted, since additional research work went to simply confirm and replicate methods and relations that had already been detected before, and hence seemed definitive. Other lines of research, instead, keep on generating discussion since results were either contradictory or limited for their conclusions to be widely accepted. On that basis, our research attemmpts to enrich the debate with new contributions, and open new lines of research.

Key Finding 2: The latest trends in the p2p market for tourist accommodation point, among other things, to: its growth, the predominance of entire homes, the professionalization of hosts, and booking policies in which flexible cancellation loses weight and instant booking gains importance.

These trends were observed from the analysis of scraping data from active listings in the Airbnb platform in early 2016 and 2019, in 10 cities of the world. Our results are compatible with the thesis that agents join the p2p market for fundamentally economic motives; and, more concretely, there is a greater percentage of suppliers that use more efficient pricing strategies and understand well revenue management techniques. All these findings reinforce the potential of economic analysis as a tool to explain the basic features of trade in the p2p market.

Key Finding 3. A significant reason for the concentration of demand in a subset of the supply in the peer-to-peer market for tourist accommodation is herding behavior, by which the decisions of the first guests are imitated by those who follow. Results show that the influence of each additional review is positive but decreasing, inducing a more balanced distribution of demand among offered accommodation, and thus dampening the herding effect. Moreover, reservation policy—specifically, enabling the instant booking option—is key to explain the initial push that accommodations need to be demanded now, and hence, to increase their possibilities of being demanded in the future.

This finding is supported by a profit- and utility-maximization microeconomic model and implemented with data of Airbnb listings corresponding to 10 European cities. The results explain how in spite of the imperfections of the p2p markets for tourist accommodation—specifically, of asymmetric information problems—, it is possible for new entrants to compete with established suppliers and break the vicious cycle of not having their accommodations booked from not having being booked before.

Key Finding 4. While the effect on prices of individual-(host-)level concentration is positive and significant, they are not at the market (city) level.

Here, we opened a new line of research, since until now, attempts to explain accommodation prices had made use of characteristics of the accommodation itself or of the host only. Our research introduced the concentration of supply, at different levels, as an explanatory variable. The key finding above was the result of implementing a theoretical model revealing a possibly positive but negligible effect of market-level concentration on average prices, indicating that only concentration at the top host level matters, together with relative demand and the weight of submarkets in the overall market.

Key Finding 5. The growth of the peer-to-peer market for tourist accommodation has negatively affected hotels' occupancy and performance, independently of their category.

This finding does not close the debate on the effects of Airbnb's expansion on established incumbents since available evidence delivers contradictory results. In any case, according to our data referred to the city of Barcelona between August 2010 and October 2018, the basic variables that define hotel performance have been affected by the develop of the p2p market for tourist accommodation for hotels of lowest category, but also for those of higher standard, which is at odds with what had been detected in previous studies. Likewise, these results have been confirmed when the case of the island of Mallorca was analyzed with data from the period June 2011-October 2018.

Key Finding 6. Airbnb has an upward effect on house prices, but not on rentals.

The discussion surrounding Airbnb's impact is not over on this matter either. Yet, the results that we have found are nontrivial and contribute evidence on the effects of the p2p market for tourist accommodation on the real estate market. From the point of view of homeowners, selling, renting in the long term and renting in the short term are three (imperfect) substitutes. If one (short-term rentals) become more profitable, supply of the others will decrease; and if those other forms of housing contracts become scarce enough, assuming resident demand is inelastic, their prices will be pushed up. However, the value of purchased houses vis-à-vis rents also increases because of the option to use their spare capacity for short-term. This effect adds onto the previous one, and in our case, it resulted in an overall increase in home purchase prices, while nothing significant happened to rents. These findings were the result of implementing a theoretical model with data from 2017 in the various neighborhoods of London.

Key Finding 7. The measures that limit the supply of accommodation in the p2p market do not guarantee the decrease of demand, since the result might be a more intensive use of existing accommodation.

Based on the measures implemented by the City Hall of Barcelona in 2017, we conducted a differences-in-differences (DiD) analysis to evaluate their real impact on demand with geographically disaggregated data from the period January 2011-April 2019. The results of the analysis highlight the importance of the difference between supply control and demand control. In fact, such a supply restricting policy might even have

counterproductive effects, by concentrating demand in certain spots within these neighborhoods where the problem of massive tourism has to be alleviated.

Key Finding 8. They also indicate that peer-to-peer hosts react fast to demand shocks and as those from traditional markets.

Here, we studied for the case of Barcelona the impacts of the events occurring in the past months of 2017, which consisted of a terrorist attack and the calling for a referendum on the independence of Catalonia, by fitting a fixed effects regression model to a data panel of Airbnb listings, using New York and Paris as a control group. The results show that, after controlling for individual and time effects, listing reviews and revenues fall in the last quarter of 2017 and do not recover until the second quarter of the next year, despite a notable effort to decrease prices in the same period. They also indicate that peer-to-peer hosts react fast to demand shocks and as those from traditional markets which once again puts into question the conclusions of certain previous research.

Key Finding 9. Seasonality in the p2p market for tourist accommodation is smaller than that existing in conventional markets.

The data for this part of the research is from the island of Mallorca between 2012 and 2018. Besides that, a municipality-based analysis proved that the variability of demand is appreciably smaller in Palma—the island's capital—than in the rest of the municipalities. This suggests that tourism demand's seasonality in urban centers is even smaller.

Key Finding 10. The effects of the p2p market depend on its degree of development and on the peculiarities of its geographical location.

In the island of Mallorca, where we appreciate a high penetration of the p2p market for tourist accommodation, we have noted that the increase of tourist stays in holiday homes is statistically significantly related to the drop in hotel occupation and to the growth tourist employment. By contrast, in Menorca—where the p2p market has less penetration—these relationships are not so clear, which makes us wonder whether there is a threshold above which the effects of the p2p market start to be noticeable. Beyond that, the analysis of said market in Latin America brought to light some peculiar features that are not present in other locations, both on the demand and on the supply sides.

XIII.3 Policy Implications

Research on the p2p market for tourist accommodation has cumulated enough evidence to make it clear that its functioning has some shortcomings related to a large extent to asymmetric information problems, and that its development affects other markets, all the while generating externalities to society as a whole. In this regard, there is wide room for economic policy to improve efficiency and equity.

To start with, the trend that points towards greater professionalization of hosts and profit-seeking motives in joining the p2p market gives a fundamental role to economic incentives so that public authorities can influence and direct agents' behavior. In parallel to that, the consideration of the services by hosts and by platforms themselves, such as Airbnb, as productive activities, creates a framework so that regulation—and in particular, fiscal requirements being compatible with fair competition between everyone that offers tourist accommodation.

Furthermore, the concentration of demand in a subset of the supply has been noted in p2p markets for tourist accommodation has been evinced, and can be explained by a herding-type model that reflects an asymmetric information problem. The review system designed by the platforms has not solved the problem since ratings are biased upwards. We have shown that the instant booking option helps hosts join the market effectively through increasing the probability that their accommodation gets booked for the first time. In this sense, Airbnb—under the objective of maximizing the number of matchings—promotes its use among hosts. This is not an issue in the conventional market where, in principle, all accommodations are instantly bookable. Should the authorities make the instant booking option mandatory in the p2p market? The answer to this question is beyond the scope of economic analysis and requires thinking on legal grounds. Still, it is evident that generalizing instant booking would prevent not just discrimination to certain groups that has already been detected in the p2p market, but also the crowding of demand on certain accommodation. Anyway, there are measures within the reach of public administrative bodies that could increase market transparency and improve information received by guests on the quality of accommodation: mechanisms of inspection and authorization; technical safety and minimum equipment requisites; channels for claim and resolution of conflicts; etc. In fact, some administrations have already advanced in this area. Other

options to be explored are the objective signaling of accommodation quality, similar to the hotel star rating.

The policy implications of the relationships between supply concentration and market prices that we have found are related to both efficiency and equity. Concerning efficiency, market suppliers with monopolistic power might be in a privileged position vis-à-vis new competitors that are trying to or have just entered the market. Although from a theoretical point of view it is logical to determine when public intervention can improve market outcomes, on a practical level we need to define thresholds above which the number of accommodations offered by a given host is considered incompatible with basic economic policy objectives (such as, for example, a more equitable income distribution). Advancing in this discussion could imply crossing the borders of positive economics to step into normative economics.

As for the impacts of the p2p market on established incumbents (hotels) have been proven not to be innocuous, although we have to stress that results are partial and hence provisional. Nonetheless, we judge pertinent to design of a legal framework with rules that ensures or facilitates fair competition between conventional and p2p accommodation suppliers. Such a regulatory framework should prevent—among other things—the tourist rental business from operating in the shadow economy or from getting privileged fiscal treatment (which would harm production and employment in the conventional sector).

Other impacts that were analyzed are related to the housing purchase prices and rental rates, and other effects that led to the implementation of market control measures. Given that the answers to problems that arise with the expansion of the p2p market are not homogeneous in terms of intensity of impacts, it is also worth making a proposal that allows to flexibly regulate the market according to social preferences. In the aforementioned context, on the basis of a model on the concept of both *contamination* and *public resources* externalities, we discuss the implementation of "transferable sharing rights" (TSR) for the regulation of rentals in the short term. This strategy would allow to render explicit some of the policy options such as quantifying the number of tourists that one government would be willing to accept into its local destination; or who should be the hosts that benefit from this market expansion.

Other relevant political implications can be derived from the evidence on the p2p market's response to a growth in uncertainty, which should cause a fall in tourism demand. Market reactions are those predicted by the elementary models of supply and demand: the drop in the number of tourists causes the price of accommodation to fall. Broadly speaking, given that political instability or terrorism affects firms' performance, marketing and advertising campaigns could stimulate demand recovery. Nevertheless, there are differences between the p2p and the traditional market for tourist accommodation that from a political perspective might suggest the use of differentiated promotion strategies since the effects on social welfare of one and another market are not the same.

Likewise, the findings on the patterns characterizing seasonality of tourist demand in the p2p market provides a rationale for the design of policies aiming for a more balanced distribution of tourists over the year; and hence, for the reduction of the most pernicious effects of demand concentration in summer months which traditionally characterizes sun and beach destinations.

Finally, the analysis undertaken confirms the convenience of modulating the public action measures in accordance to the stage of development of the p2p market for tourist accommodation in question and of its geographical location. Just like, in general terms, economic policy must adapt to the context in which it intends to have an effect, the measures that more precisely aim to improve the functioning and the outcomes of a certain market need to take into account the specificities of the environment in which it operates.

XIII.4 Contributions

Joan Robinson, one of the greatest economists of all time, introduced his main contribution to the analytical economist “as a box of tools” that “can make only an indirect contribution to our knowledge of the actual world”. And to the politician who demands solutions to complex problems, “patience” was advised while the economists perfects "tools in the hope of being able sooner or later to meet the practical man's requirements" (Robinson, 1933). The greatness of his work was to contribute original ideas in the realm of theory. Our research, in multiple ways, is on another level. It is, first and foremost, a work in the field of applied economics, without abandoning at any point the quest for originality. Within our limitations, we humbly intend our work to be useful, not only to

academic economists, but also to decision makers in economic policy. At an academic level, we have dealt with the available information using rigorous methods to show relationships within the framework of certain theoretical models, and to discover and understand the working and effects of the p2p market for tourist accommodation. At the level of economic policy, we attempt to prove, once again, the usefulness of economic analysis for decision-making.

In the context above, the goal of this thesis was to contribute to the enhancement of knowledge on the working of a particular market answering a series of research questions raised in the introductory chapter. As we answered those questions, and on the basis of previous contributions, we defined what had been learned so far; and from there, we advanced in the analysis to know what the recent trends are; how the market works; what its potential sources of inefficiencies are; what impacts it is generating; which effects it would have over seasonality; etc. In this way, we intended to cover gaps in the literature, complete the empirical evidence on certain issues that in some occasions contradicted previous analyses, and to bring forth new ideas; which are ultimately the aim of any research project.

In light of what has been put forward, and although each chapter highlights our main contributions, it is worth noting in general several types of contributions.

In the realm of theory, we have algebraically formulated various models that combine formal rigor with explanatory and predictive capacity on the agents' behavior. The assumptions on which our models are built are the usual from economic analysis, which have time and again proven to be useful simplifications of reality. It is obvious that there are other alternative methods to advance knowledge that allow for different approaches to the phenomenon that we have analyzed. However, without entering a methodological discussion that would drift away from the established objectives of this thesis, we have intended to provide theoretical support to all of our arguments and make them empirically testable, and hence, falsifiable.

From the empirical point of view, the contributions of this thesis are related to the data employed, the analyzed problems, and the econometric techniques utilized. In regard to the data, we have to a large extent taken advantage of the information extracted by Insideairbnb using web scraping. It is not the first time that this source has been used in

research works on the p2p market. In this sense, our contribution is in terms of the geographical and temporal scopes. That is, we have studied cities, sets of cities, or even islands that have not been studied before, all using recent data.

As for the issues analyzed, the thesis's contributions come from both the focus and the objectives of the study. Thus, for instance, we made a proposal in the literature review for stylized facts that so far have not been listed; or, when we examined the asymmetric information problems, we identified which options the hosts have to ease their own effective incorporation into the market. Besides, topics like the effects of concentration of supply on prices, the influence of instability on the market, or the p2p business's effect on seasonality have to our knowledge not been studied before. In addition to that, the analysis of the impacts of hotels or on the real estate market are a contribution inasmuch as they enrich the debate about the consequences of the expansion of the p2p market.

Regarding the contributions in terms of econometric techniques, the novelty lies in its usage for the inspection of precise market features. In this sense, although their usage knows some history, multilevel techniques or differences-in-differences had not been applied yet to tourist research, as far as we are aware of. Others, instead, have been more frequent and we have used them when deemed convenient. In any case, accepting that the thesis was seeking results in the field of applied economics, the emphasis was not on the refinement of techniques, but on their capacity for correct data treatment.

Finally, this thesis is not limited to raising issues and studying them. We have also tried to make progress in the field of economic policy, making recommendations for the right regulation of the p2p market. We made a proposal that allows separating the decisions of, on the one hand, the socially desirable level of expansion of the market, and, on the other, that of the concrete implementation of measures to achieve it. Here arises another (traditionally economic) discussion: that on the distinction between the normative and the positive—which is out of the scope of our work. With our regulation proposal, we simply intend to design a tool that might be utilized by those in charge of economic policy in agreement with social preferences.

XIII.5 Limitations and Future Research

Among the most important limitations of our work, which is however common in applied economics, is the relative lack of available statistical information. The p2p market for tourist accommodation is a recent phenomenon on which there are no official statistics. We admit that data access has conditioned the choices of the cases that we have taken as references to determine trends, contrast hypotheses, quantify impacts, etc. Thus, a large portion of the information comes from the Airbnb platform; which, while being the most important of the p2p market, is not the only one that matches supply and demand for accommodation of potential hosts and guests. Furthermore, web scrapings correspond to specific cities and dates that do not always match with what would have been ideal for our research. For instance, we would have liked to have panels with a longer time dimension; but this was not possible because, among other factors, the dynamic of the market itself and its exponential growth imply that going back in time excessively would produce biases and new limitations. Similarly, the definition of the set of control variables used in our econometrical estimations has been conditioned by the data available, and sometimes, we have had to mix sources.

Generally speaking, information on the supply side is more complete and accurate than that on the demand side. We must keep in mind that web scrapings collect information that is publicly visible through the Internet on the characteristics of hosts, their accommodation, and the booking policy that they set. The price that appears on ads are a reflection of the willingness to sell of hosts, but are not necessarily equilibrium prices, as we do not have exact data on whether these rooms have been actually traded at that price. The absence of information on demand received by each accommodation has been circumvented by the use of the number of reviews as a signal for real occupancy.

There are two alternatives to overcome the limitations above. One would be the collection of the necessary information through, say, an interview to guests and hosts. This has been a common choice in research on the p2p market, though it would have forced us to work with a small sample, based on highly specific local environments. Another possibility, also present in other research, would be to pay for the services of companies that can provide via big data more accurate measurements of variables such as occupation or the average daily rate. Unfortunately, the cost of this option largely exceeds the resources that we had at our disposal.

In the aforementioned context, a possible line of future research is the improvement of the quality of statistical information. This would allow not only to have more accurate approximations to the terms of trade in the p2p market, but also to expand the spatial and temporal scopes of research on tourist accommodation, or even replicate our works in other contexts. We consider particularly pertinent the works that deepen into the knowledge of the impacts on hotels and on the purchase and rental rates of homes. In both cases, available empirical evidence so far delivers mixed results. At this point, the application of a homogeneous methodology, through data coming from similar sources, could solve the question of to what extent the differences seen so far are justified by the choice of econometric techniques or data, or if instead they can be attributed to the economic or institutional particularities under which the market operates in each case.

Anyhow, the p2p market for tourist accommodation is not conclusively established yet and it is likely that it will still undergo several transformations in the future, driven by three vectors. The first one stems from the experience that hosts and guests gain as they play with different strategies to maximize their profit and utility functions, respectively. The second has to do with the changes introduced by platforms themselves to facilitate matchings and, and so, increase their profitability or their turnover. Last but not least, we are faced with the definition of new regulatory frameworks that might alter the rules of the game as we knew them until now. Against this background, it may be useful if the lines of research generate contributions aimed at verifying whether the regularities that we have detected are maintained in the future.

XIII.6 Final considerations

Fifty years ago, Leontief delivered his presidential speech at the American Economic Association, in which he stated that "Continued preoccupation with imaginary, hypothetical, rather than with observable reality has gradually led to a distortion of the informal valuation scale used in our academic community to assess and to rank the scientific performance of its members. Empirical analysis, according to this scale, gets a lower rating than formal mathematical reasoning … Thus, it is not surprising that the younger economists, particularly those engaged in teaching and in academic research, seem by now quite content with a situation in which they can demonstrate their prowess (and incidentally, advance their careers) by building more and more complicated

mathematical models and devising more and more sophisticated methods of statistical inference without ever engaging in empirical research" (Leontief, 1971, p. 3). Ever since then, in our humble opinion, the gap in academic prestige between theoretical and empirical research has narrowed; not because of the former having lost reputation, but because the later has gained consideration.

If we accept that economics is a social science that suggests verifiable propositions, then we can accept that empirical research is key to advancing the frontier of knowledge. Naturally, this does not imply rejecting reference theoretical frameworks. In fact, theory without measurement might be as sterile as measurement without theory in order to explain or predict economic phenomena. Perhaps, the traditionally low regard of certain pieces of empirical research might be due to the fact that they limit themselves to a strict description of reality; or, in the best scenario, to seek relationships between variables based in shallow theoretical arguments.

The advances experienced by empirical research—and by extension, applied economics—have been helped by the perfecting of econometric techniques, and by the availability of more powerful and user-friendly data-processing software and of more databases of greater quality. In this way, we can operate complex analytical systems without the need of aggregating or averaging the variables' values—that is, without having to suppress the identity of individual elements.

The thesis that we have produced responds to the previous considerations. Basically, it consists of empirical research with a theoretical framework of reference. In some cases, we have drawn up formal models: chapter IV laid down theoretical fundamentals of the booking policy applied by hosts; in chapter V we model the consequences of supply on prices; chapter VII is based on a formalized model evaluating the impact of the peer-to-peer market for tourist accommodation on the housing market; and chapter VIII includes a model to justify the proposal of regulation in the market. Moreover, in all cases, the empirical implementation is discussed. That is, theory has been executed with measurement and measurement with theory. Theory comes from economic analysis and measurement originates from the econometric techniques that have been considered pertinent in each case.

The empirical work has been constant and is reflected throughout the thesis. In some cases, we put forward new evidence using different datasets to contribute to solve the contradictions that still exist in previous research results, particularly on the consequences of the expansion of the p2p market on the performance of hotels and of the real estate market. In other cases, prior findings have been confirmed, such as the influence of certain variables on prices or when it was noted that growth in tourist employment is associated with greater Airbnb presence. Similarly, we rejected the idea that the p2p market for tourist accommodation does not react to external shocks; as at least in the last quarter of 2017 in Barcelona, prices experienced a fast and sharp drop as a response to the growth of uncertainty. Finally, we contributed evidence on a subject that had so far not been dealt with: the relationship between prices and concentration of supply in the p2p market for tourist accommodation. Perhaps it is convenient to highlight that all data on which our research is based is available for reproduction of our results.

The last consideration that we intend to make has to do with questions of economic policy. We have analyzed the characteristics and implications of the p2p market for tourist accommodation with the aim of broadening knowledge on the subject, but also of contributing instruments to improve better public decision making. We believe that the ultimate purpose of any economic research is to improve social welfare. These pages are our grain of sand to contribute to the design of political action programs in a market that, from various point of view, merits regulation.

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SUMMARY OF THE THESIS IN SPANISH (RESUMEN DE LA TESIS EN ESPAÑOL)

La hipótesis inicial es que el mercado peer-to-peer (p2p) de alojamientos turísticos no funciona de manera muy diferente a la de los mercados tradicionales. En consecuencia, el análisis económico convencional sería el método adecuado para elaborar modelos, encontrar explicaciones y formular predicciones, asumiendo el supuesto de maximización de utilidad por parte de los agentes. Esta estrategia facilita el rigor que proporciona el lenguaje matemático y la cuantificación. Partimos, por tanto, de la base de que el análisis económico que, entre otros principios, supone que los individuos responden a los incentivos y toman sus decisiones comparando costes y beneficios, es el instrumento adecuado para caracterizar a dicho mercado, para comprender y para valorar sus efectos, y para el diseño de medidas de política económica que respondan a las preferencias sociales.

De acuerdo con lo expuesto en el párrafo anterior, el objetivo genérico que nos planteamos cuando, formalmente, iniciamos la tesis doctoral fue ampliar el conocimiento disponible en nuestro ámbito de investigación. Queríamos evitar la tentación de replicar, simplemente, con nuevos datos lo que otros ya habían ensayado. En este sentido, el criterio básico que ha orientado este trabajo ha sido la búsqueda de elementos novedosos y, más concretamente, aportar ideas, argumentos, evidencias, etc. que no se hubieran puesto de manifiesto previamente. Lógicamente, eso obligaba a realizar un exhaustivo repaso de la literatura para conocer qué es lo que ya se sabía sobre el mercado p2p de alojamientos turísticos. El resultado final se presenta en el Capítulo II. Su contenido intenta responder a la siguiente pregunta: *¿qué hemos aprendido sobre el mercado p2p de alojamiento turístico?* Con ello se define el estado del conocimiento de la que partía nuestra investigación. De esta manera, identificamos una serie de hechos estilizados, dadas las regularidades que hasta entonces se habían encontrado en las investigaciones previas: 1) Los anfitriones y los huéspedes se unen al mercado p2p de alojamientos turísticos tanto por motivos económicos como emocionales; 2) Una de las razones que explica el crecimiento exponencial de Airbnb es su capacidad para emparejar las ofertas de los anfitriones con las demandas de los huéspedes con un coste reducido; 3) El acceso a la información sobre las características personales de los anfitriones y de los huéspedes facilita la discriminación en el mercado p2p de alojamientos turísticos.; 4)

Las valoraciones de Airbnb tienen un sesgo alcista; 5) El número de habitaciones, baños o huéspedes que se pueden alojar aumenta el precio de los alojamientos; 6) El peso de las viviendas completas en la oferta de Airbnb es mayoritaria y creciente; 7) A medida que los alojamientos ofrecidos a través de Airbnb se alejan del centro de las ciudades disminuyen su precio; 8) Los anfitriones con la etiqueta *Superhost* ofrecen alojamientos con precios más elevados; 9) Los anfitriones profesionales ofrecen alojamientos con precios más altos; 10) Los anfitriones que han estado más tiempo en la plataforma Airbnb cobran precios superiores; 11) El número de comentarios que reciben los alojamientos de Airbnb está relacionado negativamente con su precio; 12) Los alojamientos mejor valorados en Airbnb tienen precios mayores; 13) Los alojamientos con opción *instant booking* son más baratos; 14) El desayuno, la piscina, el parking y el wifi son servicios que tienden a elevar el precio del alojamiento, mientras los que incluyen la opción *smoking allowed* tienden a reducirlo; 15) La oferta de Airbnb afecta negativamente a la renta de los hoteles aunque con un impacto desigual dependiendo de su categoría; 16) El desarrollo del mercado p2p de alojamientos turísticos ha contribuido al crecimiento de la renta y del empleo; 17) La aparición de Airbnb favorece el aumento del precio de los alquileres convencionales (a largo plazo) y de los de la vivienda; 18) Los alojamientos en el mercado p2p tienen un impacto ambiental menor que los alojamientos convencionales; 19) La expansión de la oferta de Airbnb genera efectos externos negativos en las ciudades; 20) Las administraciones locales han implementado regulaciones muy diferentes sobre el mercado p2p de alojamientos turísticos.

El siguiente paso fue *identificar las tendencias recientes que están configurando el mercado p2p para alojamientos turísticos.* Así en el Capítulo III se efectúa un análisis descriptivo de los datos más recientes para confirmar tendencias o detectar cambios que ayuden a valorar la pertinencia de determinadas hipótesis. Los datos provienen de *scrapings* de los anuncios activos en la plataforma Airbnb, a principios de 2016 y de 2019, en 10 ciudades del mundo. Los resultados sugieren que el mercado p2p de alojamientos turísticos ha continuado expandiéndose en los últimos años siguiendo un patrón en el que la demanda ha crecido más que la oferta. Este hecho plantea dudas sobre la eficacia de ciertas medidas implementadas en algunas ciudades destinadas al control del mercado a través de restricciones sobre la oferta, sin tener en cuenta que la utilización más intensiva de los alojamientos podría convertirlas en ineficaces si el objetivo es limitar la llegada de turistas. En cuanto al tipo de alojamiento, aunque siguen predominando las viviendas

completas, en ciertas ciudades se aprecia un retroceso en términos relativos, quizás, como consecuencia de ciertas medidas administrativas que se han venido implementando. Respecto a los servicios facilitados, aumenta, de forma generalizada, el porcentaje de alojamientos que incluyen el desayuno en la tarifa, mientras que disminuye, con alguna excepción, los *family-friendly*. En cambio, no se aprecia una tendencia clara en los *smoking allowed*. Asimismo, existen suficientes datos para sostener que se ha producido una tendencia hacia la profesionalización de los anfitriones y, por tanto, que en el mercado p2p de alojamientos turísticos existe un porcentaje mayor de oferentes que utilizan estrategias de precios más eficientes y que conocen las técnicas básicas del *revenue management*. En este contexto, puede entenderse otras tendencias que claramente se han observado recientemente en el mercado. Por un lado, la pérdida relativa de importancia de los alojamientos con una política de cancelación flexible, que los huéspedes parecen asociar con una baja calidad de la oferta, y, por otra, el crecimiento del porcentaje de alojamientos que activan la opción *instant booking*, evitando de esta forma la posibilidad de discriminación y convergiendo con la política que se aplica en la industria convencional. Algunas de estas tendencias parece que tienen la solidez suficiente para ayudar a entender cuál puede ser la configuración definitiva este mercado. No obstante, como es lógico, habría que advertir que su sensibilidad a las innovaciones tecnológicas y a las respuestas regulatorias que se están dando desde las distintas administraciones públicas, aumentan la probabilidad de que en el futuro se detecte nuevas tendencias.

La siguiente pregunta que nos planteamos fue *¿Por qué el porcentaje de anfitriones que activan la opción de reserva instantánea está creciendo?* El Capítulo IV propone una explicación. En principio, la razón que explicaría la concentración de la demanda en un subconjunto de la oferta en el mercado p2p de alojamientos turísticos está relacionada con un comportamiento tipo *herding*, por el cual las decisiones de los primeros huéspedes son imitadas por los que siguen. Como los agentes no conocen con certeza la calidad de un determinado alojamiento, analizan las decisiones tomadas previamente en el mercado, lo cual es un comportamiento racional a nivel individual, pero podría provocar ineficiencias a nivel agregado. Una descripción elemental de este comportamiento implicaría una concentración cada vez mayor de la demanda en una parte de la oferta, lo que llevaría a posiciones monopolísticas e impondría una barrera insalvable para los nuevos anfitriones que desean ingresar al mercado. No obstante, esto no es lo que se observa en la realidad. *¿Cómo pueden los anfitriones evitar el círculo vicioso a través*

del cual no se demanda su alojamiento porque no han sido ocupados antes? Para encontrar la respuesta debemos tener en cuenta que la reputación y la confianza necesarias para permitir transacciones en mercados p2p para alojamientos turísticos se basan, en gran medida, en un sistema de valoraciones, como en otros mercados que operan en Internet. Es decir, dependen de las opiniones subjetivas expresadas por los agentes participantes. Sin embargo, este sistema tiene importantes debilidades, entre las cuales encontramos el mencionado sesgo alcista de las valoraciones. No obstante, aunque pierda importancia, por este motivo, el contenido de las valoraciones, su número sigue siendo relevante. Como demuestra la evidencia empírica, el número de reseñas explica la cantidad de reservas mejor que las puntuaciones. Sobre esa base construimos un modelo en el que incorporamos una serie de variables que, conjuntamente, pueden amortiguar o incluso compensar el efecto *herding*. Nuestra estrategia de estimación se implementó con datos de la plataforma de Airbnb correspondientes a anuncios en las 10 ciudades europeas donde Airbnb es más popular, y confirman que existen otras variables, además del número de valoraciones, como el precio, los indicadores de capacidad física, la distancia al centro, la etiqueta *Superhost* y la política de reserva que son estadísticamente significativos para explicar el aumento de la demanda de algunos alojamientos. En particular, los elevados coeficientes que acompañan a la variable que representa la política de reserva serían indicativos de su particular importancia. Otra observación interesante es que el número de valoraciones en sí tiene una influencia positiva en el número futuro de reservas, lo que es indicativo de la presencia de un comportamiento tipo *herding*. Sin embargo, la influencia de la valoración marginal disminuye a medida que el número de valoraciones crece, evitando una concentración cada vez mayor de reservas en ciertos anuncios. La conclusión clave de nuestros hallazgos es que en los mercados de alojamiento p2p, a pesar de los problemas de información asimétrica altamente prevalentes y las imperfecciones en los mecanismos establecidos de confianza y de reputación, es posible que los nuevos competidores compitan con los oferentes establecidos. En concreto, la opción *instant booking* puede ser la palanca necesaria para abandonar el círculo vicioso de no recibir visitas por no haber sido visitado antes, y, en consecuencia, entrar en la dinámica opuesta. Otra cuestión está conectada con la creciente presencia de anfitriones profesionales, es decir, anfitriones que ofrecen más de un alojamiento. Revisando la literatura, habíamos encontrado una serie de trabajos que relacionaban el precio con las características del alojamiento, los servicios proporcionados, la ubicación, las características del anfitrión o la política de reserva, pero ninguno sobre los efectos de la concentración de la oferta en

los precios. Así surgió la siguiente cuestión: *¿Influye la concentración de la oferta en los precios en el mercado p2p de alojamientos turísticos?* La respuesta que encontramos está contenida en el capítulo V en donde proponemos un modelo que implementamos con datos de 68 ciudades del mundo, para comprobar en qué medida la concentración de la oferta, tanto a nivel individual como de mercado, explica los precios. La evidencia disponible ya había demostrado que, aunque los anfitriones profesionales adaptan sus precios a la demanda para lograr un mayor desempeño económico que los no profesionales, su presencia no está necesariamente asociada a mayores precios en el mercado en el que operan. Nuestra tesis fue que la estructura del mercado, específicamente las cuotas de mercado de los anfitriones y la concentración a nivel de la ciudad, influye en los precios de manera diferente al recuento absoluto de anuncios de los anfitriones. Y, entre esos dos factores (nivel de anfitrión y nivel de ciudad), los efectos pueden ser distintos. Aquí el análisis multinivel resulta especialmente adecuado en la medida en que los precios variaban de manera estadísticamente significativa entre los anfitriones y las ciudades en nuestra base de datos. Según esta metodología y controlando los atributos de alojamiento y las características básicas del anfitrión, las estimaciones mostraron que, de hecho, la concentración a nivel del anfitrión influye positivamente en el precio. Más concretamente, un aumento en la participación de mercado del anfitrión en términos de anuncios en un 10 por ciento aumenta el precio entre 4.1 y 9.9 por ciento según el modelo. Sin embargo, a nivel de la ciudad, un aumento de la concentración de la oferta, desde una distribución perfectamente uniforme hasta la desigualdad total, se asocia con un aumento no significativo del precio. Estos resultados son compatibles con nuestro modelo que predice un efecto posiblemente positivo pero insignificante de la concentración a nivel de mercado en los precios promedio. En este punto se realiza una contribución teórica al modelar cómo la cuota de mercado individual es importante para la fijación de precios pero la concentración a nivel de mercado no.

Otras preguntas que planteamos no son nuevas, pero los resultados de las investigaciones previas no habían encontrado una respuesta definitiva y el debate, en torno a ellas, siguía abierto. En este caso, nuestro objetivo no fue cerrar el debate sino, más bien, aportar nuevas evidencia e ideas que enriquecieran la discusión. En particular, ya que la evidencia empírica disponible sobre el efecto de la expansión de Airbnb en los hoteles en destinos turísticos es contradictoria, resultaba pertinente seguir investigando sobre el tema. Esa fue la intención del Capítulo VI titulado *Is Airbnb bad for hotels?* En él, utilizando datos

mensuales referidos a la ciudad de Barcelona, entre agosto de 2010 y octubre de 2018, constatamos que la expansión del mercado p2p para alojamientos turísticos afectó negativamente a la ocupación y a los ingresos de los hoteles, con independencia de la categoría del establecimiento. Por consiguiente, los resultados sugieren que los alojamientos en Airbnb son, hasta cierto punto, sustitutivos de los alojamientos en los hoteles. Sin embargo, esta conclusión deberá ir acompañada de, al menos, dos puntualizaciones que, aunque podrían parecer obvias, merecen destacarse. La primera se refiere a la metodología y los datos empleados. Las cifras agregadas ocultan comportamientos individuales diferentes y, de hecho, es posible que, en determinados casos, exista una relación de complementariedad entre ambos tipos de alojamientos. La segunda puntualización está relacionada con las especificidades que rodean al caso analizado y que, como es lógico, obligan a ser prudentes respecto a la generalización de las conclusiones alcanzadas. Precisamente, es posible que la disparidad de las metodologías utilizadas y las peculiaridades de cada caso ayuden a explicar la ausencia de coherencia en los resultados de la investigación realizada hasta el momento. Por lo tanto, una aproximación que incorpore, tanto en el lado de la demanda como en el de la oferta, observaciones individualizadas de las características de los alojamientos y las preferencias de los visitantes, referido a un amplio conjunto de destinos, posibilite un modelo y una estimación más rigurosos y completos de los efectos causados por Airbnb en los alojamientos convencionales. Nuestro trabajo, en cualquier caso, aporta evidencia que es compatible con la competencia entre Airbnb y los hoteles para ciertos segmentos del mercado. En este contexto, además de las condiciones establecidas en el marco regulador, la capacidad de los operadores tradicionales para atraer y retener a la demanda turística se enfrenta a desafíos adicionales con la llegada de nuevos oferentes que, de acuerdo con los resultados de nuestra investigación, están afectando a la posición que tradicionalmente han tenido en el mercado. La viabilidad de algunos hoteles incluso podría verse comprometida en la medida en que necesiten recursos para renovar su capacidad productiva, ya que los propietarios privados ofrecen alojamientos a un coste menor. En consecuencia, los hoteles que no puedan competir en precio o ubicación podrían verse obligados a diferenciar los servicios que prestan para garantizar su supervivencia.

En cuanto a los efectos del mercado p2p de alojamientos turísticos sobre el mercado de la vivienda planteamos esta cuestión: *¿Cuáles son los impactos de Airbnb en el mercado*

inmobiliario? A tal efecto, en el Capítulo VII, utilizando datos de la ciudad de Londres, determinamos en qué medida el desarrollo de dicho mercado afectó a los precios de alquiler y de venta de viviendas. Los resultados de la estimación empírica indicaron que la presencia de Airbnb solo tiene un efecto significativo en los precios de la vivienda, pero no en los alquileres. El efecto sobre los precios de la vivienda se explica, no solo porque un número creciente de propietarios están destinando la oferta de su vivienda al mercado turístico—lo que hace que la oferta de vivienda para residencia permanente sea más escasa y costosa— sino también por el hecho de que el incremento de la rentabilidad de las viviendas en un área determinada aumenta su atractivo y, a través del incremento de su demanda, también de su precio. En cambio, la persona que vive en una casa alquilada generalmente no puede subarrendarla a un turista a través de Airbnb ya que, normalmente, se lo impide los términos del contrato, por lo que solo experimenta el aumento de los precios de los alquileres debido a que los propietarios reducen su oferta a favor de la vivienda turística. Sin embargo, este efecto no resultó significativamente positivo en nuestras estimaciones. Por lo tanto, podemos concluir que, aunque la presencia de Airbnb eleva el precio de las viviendas, es un efecto que beneficia, fundamentalmente, a los residentes que ven incrementado el valor de su patrimonio acumulado.

El mismo tema se aborda en el Capítulo VIII con datos de Barcelona y con una técnica diferente. Además, se construye un modelo en el que basamos una propuesta para regular el alojamiento p2p que pretende, en la práctica, acercarse al nivel de implementación socialmente óptimo. El mercado de alojamiento p2p se caracteriza, entre otros elementos, tal como se ha destacado anteriormente, por la concentración de la demanda en unos pocos alojamientos, y por una orientación hacia el centro de las ciudades, con efectos externos sobre la población residente de distinta índole, que ha provocado un debate social sobre la pertinencia de actuar para regular este fenómeno. En este contexto, las reglamentaciones han sido heterogéneas y suponen una variedad de intervenciones que van desde la prohibición hasta diferentes niveles de restricciones, tanto cuantitativas como cualitativas que, básicamente, son exigidas a los propietarios de las viviendas y limitan su capacidad de alquiler a corto plazo. No obstante, a pesar de su heterogeneidad, las intervenciones que, hasta ahora, se han articulado ponen el énfasis en la oferta. Nuestra propuesta, en cambio, se orienta hacia el control de la demanda. La base teórica se encuentra en la política de incentivos para el control de las emisiones contaminantes. En

concreto, la idea consiste en la utilización de permisos transferibles para la regulación de los alquileres turísticos a corto plazo. Esta estrategia permite hacer explícitas ciertas decisiones políticas como el número máximo de turistas que se está dispuesto asumir o el criterio sobre la distribución inicial de los permisos. Por otro lado, se dejaría que el mercado, cuyo tamaño se definiría políticamente, resolviera el problema, a través del intercambio, de su asignación eficiente para garantizar que su precio se aproxime al coste marginal en los que incurren los anfitriones cuando alojan a los huéspedes. Es evidente que la implementación de este sistema tropieza con algunas dificultades que exigirían la supervisión, ya sea pública o por medio de una agencia independiente, que evite, por ejemplo, comportamientos colusorios o fraudes en su aplicación. Se trata, en definitiva, de explorar la pertinencia de utilizar en el mercado turístico una política que ya se ha implementado con cierto éxito en el mercado de productos para el control de las externalidades.

Desde otro punto de vista, la coincidencia determinados sucesos acaecidos en Barcelona durante el último trimestre de 2017 se convirtieron en una oportunidad para conocer cómo funciona el mercado p2p de alojamientos turísticos y, más concretamente, cómo se adapta a los shocks externos. A este tema le dedicamos el capítulo IX en el que se pueden encontrar argumentos para responder a las siguientes preguntas: *¿Son los precios flexibles en el mercado p2p de alojamientos turísticos? ¿Y los ajustes? ¿Son rápidos o lentos?*. Aunque la evidencia empírica había confirmado en repetidas ocasiones que el terrorismo y la inestabilidad política afectan a la demanda turística, la discusión se había centrado en la cuantificación del impacto en el número de turistas o sus gastos, en los efectos de contagio entre países o en la resiliencia. Sin embargo, nunca se había analizado el efecto conjunto de un ataque terrorista y de la inseguridad percibida por la inestabilidad política sobre la demanda turística de los destinos y, en ningún caso, sobre el mercado p2p. Nuestro trabajo aborda este análisis planteando la hipótesis de que las reacciones y los efectos sobre el mercado de alojamientos turísticos p2p son similares a las que podrían afectar a los hoteles. Pues bien, el análisis de los resultados obtenidos es compatible con la tesis de que los ataques terroristas de Barcelona a mediados de agosto de 2017 tuvieron un impacto adverso en la demanda de viviendas turísticas a corto plazo, lo que confirma los resultados de investigaciones anteriores respecto al mercado turístico en general. Sin embargo, lo que se aprecia es una moderación en el crecimiento de la demanda, no una reducción. Esta evidencia está en línea con investigaciones anteriores, que atribuyen una

menor influencia de los ataques terroristas aislados, en el destino de los países desarrollados, que la que tendría la inestabilidad política. Según nuestro análisis, la consulta sobre la independencia de Cataluña (declarada ilegal por el poder judicial) y sus consecuencias políticas generó un aumento de la incertidumbre que contribuyó a acelerar la caída de la demanda en el mercado de alojamiento turístico p2p en el último trimestre de 2017. Las conclusiones derivadas de la evolución de los precios son particularmente relevantes. Los anfitriones que se enfrentaron a una moderación o caída en la demanda de sus viviendas parecen haber reaccionado reduciendo sus precios. Sin embargo, esta estrategia no evitó que sus ingresos cayeran en términos relativos durante el último trimestre de 2017, cuando los niveles de inestabilidad política en Barcelona fueron más altos. En cualquier caso, las señales enviadas por el mercado incentivaron a los anfitriones a alterar sus precios en la misma dirección que se esperaría en los mercados tradicionales. Nuestras estimaciones indican que, después de controlar los efectos temporales comunes en Barcelona, París y Nueva York, y los efectos fijos individuales (a nivel de anuncio), se observa una marcada tendencia descendente en los precios de alojamiento p2p a partir del tercer trimestre de 2017. El retorno a los niveles de precios anteriores solo se produce tras el primer trimestre de 2018. Además, si bien el número valoraciones no parecen tan afectadas, los ingresos estimados caen durante el mismo período, y no pueden ser atribuidas al comportamiento estacional de la demanda, sino a los acontecimientos mencionados. Dichos movimientos sugieren que los anfitriones de alojamiento p2p ajustan sus precios a los shocks externos de manera similar a lo que se esperaría de los oferentes (hoteles) tradiciones. Debe advertirse que la cuantificación de la intensidad de ambos efectos, el ataque terrorista por un lado y la incertidumbre política por el otro, no puede separarse ni, por tanto, compararse ya que existe la posibilidad de agregación o cancelación de los shocks.

Otro tema que nos propusimos explorar se refiere a uno de los problemas que, recurrentemente, se relacionan con el turismo: la estacionalidad. *¿Ha contribuido la expansión del mercado p2p a suavizar la demanda turística o, por el contrario, ha acentuado su estacionalidad?* Para ello, en el capítulo X, analizamos el caso de la isla de Mallorca, como ejemplo típico de destino maduro orientado al turismo de sol y playa, para confrontar la hipótesis de que la estacionalidad en el mercado p2p de alojamientos turísticos es menor que la existente en los mercados convencionales. La evidencia que aportamos confirma, en efecto, esta hipótesis. Además, dentro del mercado p2p, se

aprecia que la variabilidad de la demanda es sensiblemente más reducida en Palma, la capital de la isla, que en el resto de los municipios lo cual sugiere que la estacionalidad de la demanda turística en los centros urbanos es aún más reducida. Esta realidad permite descubrir las potencialidades que tiene el mercado p2p como instrumento para reducir la estacionalidad y, al mismo tiempo, para ponderar de una manera más completa los efectos colaterales de su regulación. En particular, habría que valorar los *trade-off* entre objetivos que se plantean al implementar políticas que regulan el mercado. Por ejemplo, la limitación de los días en los que se permite alquilar una vivienda al año que establece la normativa aplicable en las Islas Baleares, y también se ha planteado en algunas ciudades de Europa y USA con el objetivo de aliviar la presión que ejerce el turismo sobre la población residente, podría estar contribuyendo indirectamente al incremento de la estacionalidad. Si, en vez de aprovechar el potencial que tiene el mercado p2p para atraer turistas en temporada baja, se limita la capacidad de los propietarios para alquilar su propia vivienda, y éstos optan por utilizar la capacidad de maniobra que le permite la legislación para concentrar su oferta en los meses de verano, se estaría contribuyendo a perpetuar los problemas asociados a la estacionalidad. Una vez más, como es habitual en las decisiones que afectan a una colectividad que tiene intereses heterogéneos, nos encontramos con un problema que exige una decisión política que pondere adecuadamente los beneficios netos los distintos grupos sociales.

Los dos últimos capítulos, antes de las conclusiones, profundizan en el funcionamiento del mercado p2p de alojamientos turísticos en entornos concretos. El capítulo XI se centra en lo casos de Mallorca y Menorca para valorar *qué impactos tiene el mercado p2p en destinos con distintos grados de desarrollo*. En términos generales, se observa que, en ambos casos, algunas características propias de ese mercado se manifiestan con especial intensidad como, por ejemplo, el protagonismo que tiene la oferta de viviendas completas o la concentración de la demanda en unos pocos alojamientos. También es destacable la desigual distribución espacial de la oferta en función de la estructura urbana existente, y la agudización de los problemas relacionados con la estacionalidad turística. No obstante, las diferencias en el grado de desarrollo del mercado permiten apreciar ciertas peculiaridades en cada caso. Así en Mallorca, con una mayor implantación del alquiler a corto plazo de viviendas turísticas, la ocupación hotelera parece haberse resentido, con independencia de la categoría del establecimiento, del aumento de la demanda en el mercado p2p, mientras que el empleo turístico ha aumentado. En cambio, el menor

desarrollo alcanzado en Menorca, quizás explique que esas afirmaciones no encuentren un respaldo estadísticamente significativo. Estos resultados sugieren que, al margen de la morfología o los condicionantes urbanos de cada isla, deben sobrepasarse ciertos umbrales para que los impactos de hagan evidentes.

Por su parte, el Capítulo XII proporciona evidencia empírica sobre el *funcionamiento del mercado p2p para alojamientos turísticos en América Latina* comparando los resultados y destacando sus peculiaridades respecto a destinos turísticos consolidados, como los mercados europeos o norteamericanos, donde las investigaciones han centrado sus esfuerzos analíticos. Los datos proceden de *scrapings* realizados a mediados de marzo de 2019 de los anuncios que aparecen en la plataforma Airbnb para las ciudades de Buenos Aires (Argentina), Ciudad de México (México), Río de Janeiro (Brasil) y Santiago de Chile que se encuentran entre las más visitadas del mundo. El enfoque teórico proviene, una vez más, del análisis económico y se implementa con técnicas estadísticas, econométricas y un modelo de regresión hedónico para identificar las variables que determinan la oferta, la demanda y los precios de los alojamientos. Los resultados demostraron que el mercado p2p en Latinoamérica tiene un amplio margen para seguir creciendo y configurarse como un mercado profesionalizado de alquiler de viviendas completas a corto plazo, que existe una elevada concentración de la demanda en unos pocos alojamientos, y que los anfitriones no están explotando toda la capacidad que existe para gestionar eficientemente los precios de sus alojamientos. Todo ello sugiere que, en los mercados emergentes, a diferencia de los destinos turísticos más maduros, es pertinente la incorporación de elementos específicos, como los relacionados con la equidad y con el reparto del valor añadido, en un marco global de valoración del bienestar social que generan los intercambios realizados a través de Airbnb. A lo que se nos alcanza esta aproximación constituye el primer análisis del mercado p2p de alojamientos turísticos que toma como referencia varias ciudades latinoamericanas con implicaciones teóricas y prácticas que podrían extenderse a otros mercados emergentes.

Entre las limitaciones más relevantes de la investigación realizada a propósito de esta tesis que, por otra parte, son muy frecuentes en economía aplicada, se encuentran la relativa a la información estadística disponible. El mercado p2p de alojamientos turísticos es un fenómeno relativamente reciente sobre el que no existen estadísticas oficiales. Reconocemos que la accesibilidad a los datos ha condicionado los casos que hemos

tomado como referencia para determinar tendencias, contrastar hipótesis, cuantificar impactos, etc. Así, buena parte de la información proviene de la plataforma Airbnb que, si bien es la más importante en el mercado p2p, no es la única que empareja la oferta de los anfitriones con la demanda de los huéspedes. Además, los *scrapings* se refieren a ciudades y periodos temporales concretos que no siempre se han ajustado a los que, desde el punto de vista del objeto de la investigación, hubieran sido deseables. Por ejemplo, hubiéramos preferido disponer, en determinadas ocasiones, de muestras longitudinales más amplias, pero no ha sido posible porque, entre otras razones, la propia dinámica del mercado y su crecimiento exponencial implica que retroceder demasiado en el tiempo hubiera introducido sesgos y nuevas limitaciones. De forma similar, las variables control que hemos manejado en las estimaciones de los modelos econométricos han sido definidas en función de los datos disponibles.

En términos generales, la información de la oferta en el mercado ha sido más completa y precisa que la de la demanda. Debemos recordar que los *scrapings* recogen la información visible a través de Internet de las características de los alojamientos, de los anfitriones, y de la política de reserva que establecen los oferentes. En particular, los precios que aparecen en los anuncios son el reflejo de la disposición a ofrecer de los anfitriones, pero no son precios de equilibrio ya que no hemos dispuesto de las características de las transacciones que, efectivamente, se han producido en el mercado. La ausencia de información sobre la demanda para cada alojamiento se ha superado aproximándola al número de evaluaciones pero, en cualquier caso, sigue siendo una simple señal de la ocupación efectiva. Para superar las limitaciones anteriores existen dos alternativas. Una sería la recopilación de información primaria a través, por ejemplo, de entrevistas directas tanto a propietarios como a turistas. Esta opción ha sido relativamente frecuente en las investigaciones sobre el mercado p2p aunque obliga a trabajar con muestras reducidas referidas a entornos locales muy concretos. Otra posibilidad, que también ha sido utilizada en otras investigaciones, hubiera sido contratar los servicios de empresas que, a través del *big data*, ofrecen aproximaciones más precisas a variables como la ocupación o la rentabilidad efectiva de cada alojamiento. Ahora bien, el coste de esta opción sobrepasaba con mucho los recursos de los que disponíamos.

En el contexto anterior, una posible línea futura de investigación consiste en mejorar de la calidad de la información estadística que permitiría, no sólo una valoración más precisa

de las condiciones en las que se efectúan los intercambios en el mercado p2p de alojamientos turísticos, sino también una ampliación del ámbito espacial y temporal de la investigación. Particularmente pertinentes serían las investigaciones que profundicen en los impactos sobre los hoteles y sobre el precio de alquiler y venta de las viviendas. En ambos casos la evidencia empírica disponible arroja resultados diversos. En este punto la aplicación de metodologías homogéneas, a partir de datos extraídos de fuentes similares, podría resolver hasta qué punto las discrepancias en los resultados se justifican, tal como se ha advertido, por diferencias en las técnicas econométricas empleadas o en los datos utilizados o, en cambio, pueden ser atribuidos a las peculiaridades económicas o institucionales en las que opera, en cada caso, el mercado p2p.

En cualquier caso, el mercado p2p de alojamientos turísticos aún no se ha configurado definitivamente y es previsible que siga experimentando transformaciones en el futuro impulsado por tres vectores. El primero se deriva de la experiencia que van acumulando, tanto oferentes como demandantes, al ensayar distintas estrategias para maximizar sus funciones de beneficio o de utilidad, según el caso. El segundo, se refiere a los cambios que las propias plataformas introduzcan para facilitar los emparejamientos y, de esta manera, elevar su rentabilidad o volumen de negocio. Por último, pero no menos importante, nos encontramos con la definición de nuevos marcos regulatorios que pueden alterar las reglas del juego establecidas hasta ahora. En este contexto, puede ser conveniente que las líneas de investigación que hemos abierto generen aportaciones destinadas a comprobar si las regularidades que hemos detectado se mantienen en el futuro.

La tesis que hemos elaborado constituye, básicamente, una investigación empírica que tiene un marco teórico de referencia. En algunos casos, se han elaborado modelos formales: en el capítulo IV se plantearon los fundamentos teóricos de la política de reserva que practican los anfitriones; en el capítulo V se modeló las consecuencias de la concentración de la oferta sobre los precios; el capítulo VII se basa en un modelo formalizado para la evaluación del impacto del mercado p2p de alojamientos turísticos sobre el mercado de la vivienda; y en el capítulo VIII se incluye un modelo para justificar la propuesta de regulación del mercado. Además, en todos los casos, se discutió su implementación empírica. Es decir, se ha realizado teoría con medición y medición con

teoría. La teoría proviene del análisis económico y la medición se ha implementado utilizando las técnicas econométricas que, en cada caso, se consideraron pertinentes.

En cualquier caso, el trabajo empírico ha sido constante y se refleja a lo largo de toda la tesis. En ciertas ocasiones se ha aportado nueva evidencia, utilizando diferentes conjuntos de datos, para contribuir a resolver las contradicciones que aún existen sobre los resultados de investigaciones previas y, en particular, en las consecuencias de la expansión del mercado p2p de alojamientos turísticos sobre el desempeño de los hoteles y sobre el mercado inmobiliario. En otros se han confirmado hallazgos ya descubiertos como, por ejemplo, cuando se determinó la influencia de ciertas variables sobre los precios o cuando se constató que el crecimiento del empleo turístico se asocia con la mayor implantación de Airbnb. Asimismo, se ha refutado la idea de que el mercado p2p de alojamientos turísticos no reacciona a los shocks externos al demostrarse que, al menos en el último trimestre de 2017 en Barcelona, los precios se redujeron rápida y apreciablemente como respuesta al crecimiento de la incertidumbre. Por último, se aportó evidencia sobre un tema que, hasta ahora, no había sido tratado: la relación entre precios y concentración de la oferta en el mercado p2p de alojamientos turísticos. Quizá sea conveniente destacar que todos los datos en los que hemos basado nuestra investigación están disponibles para que, si se estima oportuno, puedan verificarse los resultados obtenidos.

La última consideración que queremos realizar toca a cuestiones de política económica. Se han analizado las características e implicaciones del mercado p2p de alojamientos turísticos con el objetivo último, no sólo de ampliar el conocimiento sobre el tema, sino también con la intención de aportar instrumentos que faciliten las mejores decisiones públicas. Creemos que el propósito último de cualquier investigación económica es contribuir a la mejora del bienestar social. La tesis elaborada representa nuestro grano de arena al diseño de programas de acción política en un mercado que, desde distintos puntos de vista, necesita ser regulado.