

# Effects of Short-Term Rentals on Local Housing Prices and Rents:

A Literature Survey

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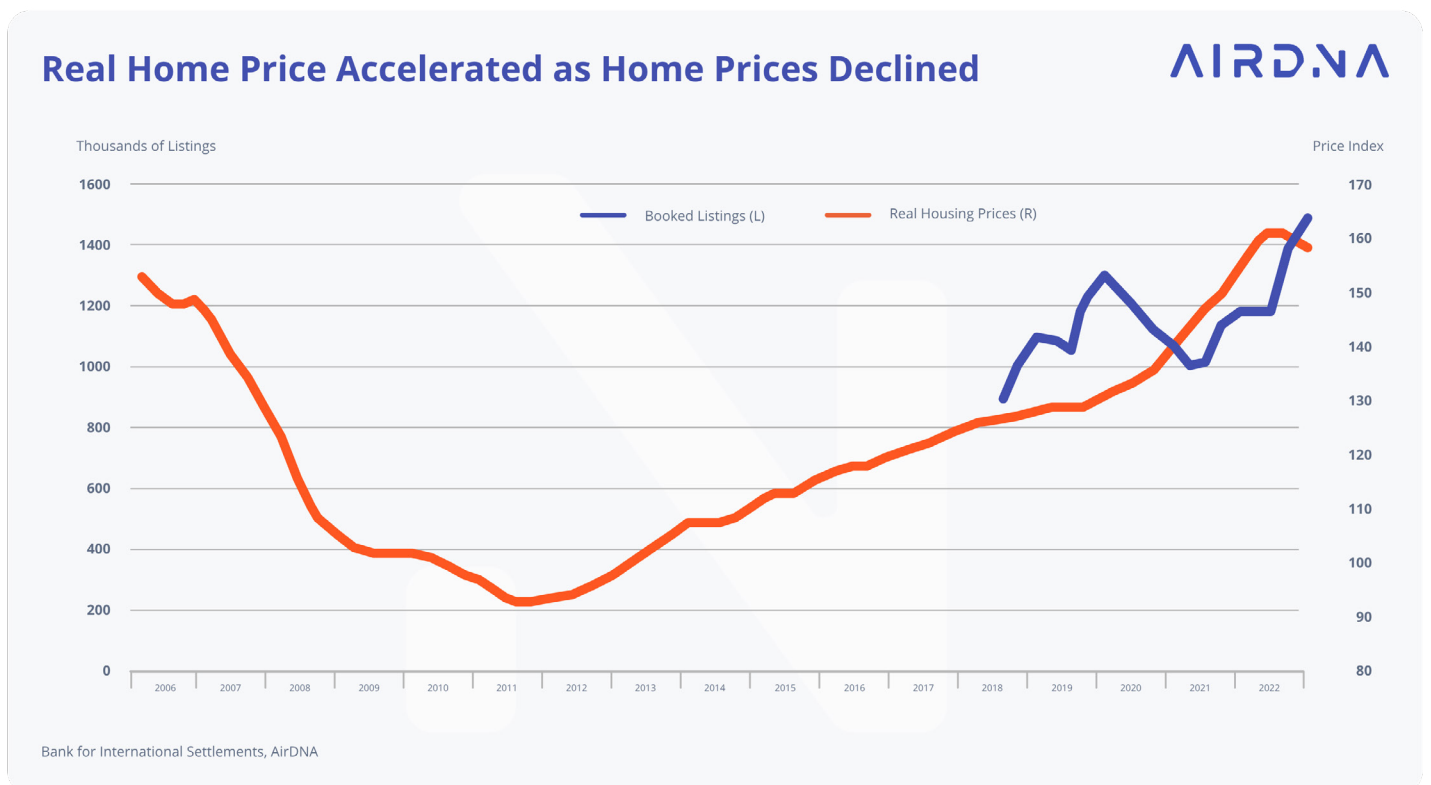
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## Executive Summary

- A concurrent increase in housing prices and short-term rental (STR) supply motivated a literature examining the relationship between the two.
- Initial literature that looked at New York and the entire U.S. found a large effect of 17% and 20% home appreciation due to STRs over a period of about a doubling of STR supply or about four years.
- Later studies that controlled for market popularity and other variables found a positive but much smaller effect of between 1–4% when looking at the entire market and concentrated in very specific touristic areas.
- Broad national studies find no detectable association between costs and STRs. In France, the relationship is only consistently found in Paris.
- STRs produce predominantly positive externalities, reflected in slightly higher home prices. The effect on crime is ambiguous, with entire home and private room rentals slightly decreasing crime and shared room rentals slightly increasing it.
- Other positives include additional tourist expenditure, tax receipts, and new business formation.

## I. Introduction

Housing affordability has re-emerged as a chief concern to both policymakers and ordinary households in the U.S. Rapid growth since the beginning of the COVID-19 pandemic has driven real housing prices to a new all-time high, handily surpassing the previous highs set in the real estate boom that preceded the Great Recession. Naturally, policymakers are searching for a remedy, and restricting short-term rentals (STRs) is one proposed solution that has garnered attention. Exhibit 1 illustrates the concurrent rise in the STR market and housing prices.





Although it is true that the general trend in both listings and prices has been upward, the relationship is not consistent. Since the Great Recession of 2007–2009, U.S. residential prices had been increasing moderately, or even increasing at a decreasing rate. This secular trend began well before the popularization of STRs, engendered by the introduction of digital tools such as Airbnb. Moreover, the period immediately following the introduction of the global COVID-19 pandemic has a sharp divergence in the two.

Although growth in housing prices slowed at a time when STR booked listings were growing most quickly and sped up as booked listings declined in 2020, the coincident occurrence of STR recovery in 2021 as well as the achievement of all-time high pricing in real terms of U.S. residential property has created a good deal of perceived association for prospective home buyers, media journals, and policymakers.

In an effort to provide some relief to potential homebuyers and renters in a market, many localities have resorted to regulations of short-term rentals. These often result in noticeable discontinuities, or breaks, in the data for supply, demand, and pricing. Notable cities that enacted relatively strong regulations include Atlanta, New York, Berlin, Sydney, Tokyo, and Amsterdam, among many others. There has also been a small and growing body of academic and business studies about the effects of these regulations, often taking advantage of the abrupt change in the data following the regulation to try to tease out the effect that STRs have on both housing prices and rental rates.

I will review the most recent findings from the literature to assess whether regulations are efficacious in limiting the growth of rent and housing prices in a meaningful

way. A large, significant effect may indicate that the regulatory approach might be able to address housing shortages, while a weak or small effect may indicate that STRs could be a red herring in the face of larger economic and structural issues affecting the availability of housing.

Distributional effects and equity effects are also important to discern, as regulations that specifically target housing for low-income people are most suited to address concerns about affordability. Even if regulations are effective in this regard, those regulations will exact a direct toll on some members of the regulated community. Not only do lower housing prices make homes more affordable to the potential buyer, but they also represent a loss of wealth for the homeowner. Lower housing prices also may discourage future development of the housing stock. In other words, if housing is prevented from being used most efficiently, the market will produce less of it than is optimal. This is a similar situation to what the regulation was originally formulated to address.

Lastly, although theoretically lower home prices may translate into lower long-term rental prices, this may not always or even usually be the case. For example, a second home only inhabited for part of the year by its owner: although removing the ability to let the home on the STR market would lower the value of the home, it is not likely to force the home into the long-term rental market. Rather, the home will simply be uninhabited for part of the year, representing a net loss of value to society.

## II. Case Studies of Cities

In the earliest stages of STR research, city case studies were essential, as STRs only had a significant presence in certain locations. Moreover, in these dense, urban areas, housing availability and affordability have been perennial concerns among residents. The first of these case studies, Sheppard and Udell (2016), captured attention by estimating a considerable effect, larger than generally found in subsequent studies.

In a highly influential paper, Sheppard and Udell lay out what may be the first statistically robust interrogation of the relationship between STR density and housing prices. The authors consider New York, one of the first markets to see extensive Airbnb visibility and still a large STR market today. They use a hedonic model, or a model that attempts to explain the effect of individual property characteristics on the eventual price of the house. An admitted problem in this approach is that unobserved changes that affect the price of housing and STRs simultaneously could cause the effect of STRs to be misstated.

Although advocates for housing affordability were mentioned in the study as raising concerns that house prices might rise in the notoriously expensive metro because of STRs, the authors approach the problem agnostic as to the direction of the effect. Other critics of STRs complained that what were viewed as unregulated hotels could bring crime, traffic, noise, and transiency to neighborhoods, diminishing values. These “negative externalities” of home sharing would be balanced against the positives of the extra income stream for residents and the usual economic impacts of tourism. These

economic impacts include additional money spent on restaurants, entertainment, retail, and transportation and the associated tax revenues.

Sheppard and Udell conclude that the positives overwhelmingly outweighed the negatives and that the doubling of STR listings in the sample led to as much as a 6–11% appreciation in home values. On the other hand, the authors caution that STR regulation may not be the ideal way to address affordability, likening trying to moderate home prices by regulating away STRs and their associated benefits to trying to help affordability by encouraging crime.

There are two additional notable studies that followed along in a similar vein in the Sheppard and Udell paper, albeit using additional or different control variables. Horn and Merante (2017) published an analysis of the effect of STRs on rents, also using a hedonic model. The paper looks at census tracts in Boston. It finds a significant but much more moderate effect of STRs on rents than Sheppard and Udell found for housing prices. Between the least and most dense STR tracts, they could attribute a 3% premium in asking rents to STRs.

A more recent paper by Todd, Musah, and Cheshire (2021) uses a socioeconomic index to control for otherwise unobserved confounding effects to estimate the effect of STRs on home prices. The authors find a small but significant effect. The totality of STRs in London could account for half of a percent of appreciation per month over the time period studied, although the effect varied considerably by geography.





## II.ii. Models that specify spatial instruments to account for unobserved effects

An important factor that could bias estimates of the effect of STR concentration is unobserved factors that influence STR location and house prices simultaneously. Some unobserved feature, whether it be urban renewal, local infrastructure investment, or merely changes in tastes, could make a neighborhood more fashionable to both live in and visit, creating an illusion of causality. This has motivated a second wave of literature that refines the estimates of Sheppard and Udell. The results from most of these are that STRs are a small but identifiable cause of higher rents and home prices. In addition, several of these studies are able to better pinpoint where and which times of housing are most affected.

García-Lopez et al. (2020) look at the housing market in Barcelona. Previous studies had mentioned confounding effects of unobserved variables, but this paper deals with it directly, naming “urban revival” as a potential source of error. The idea is that certain parts of dense metros are becoming more generally desirable in the process of urban revival, making home prices increase at the same time visits through STRs are becoming more in demand. The authors use several tactics to sidestep this problem, most importantly, an instrumental variables approach that uses proximity to tourist amenities and predicts Airbnb listings but, by itself, not changes to rent or housing price growth.

The result is that in Barcelona, the city with the sixth highest Airbnb penetration, rents typically increased by 1.9% as a result of STR activity, while posted home prices

increased by 3.9%. The authors find that most of the rent increases actually seen in Barcelona over the time period cannot be attributed to STRs, although the STR effect is more pronounced in specific touristic areas, increasing rent by 7% and posted prices by 14% in these areas.

Koster, Ommeron, and Volkhausen (2021), nearly contemporaneously with García-Lopez et al., developed a study of STRs in Los Angeles that also took specific measures to address unobserved confounders. The instrument used in their paper was also geographic, specifically looking at regulations that affected only certain areas and transactions that occurred on either side of the boundaries of these areas. They named the approach “quasi-experimental” in that it used the regulations as a natural experimental treatment of certain groups, while others unaffected by the regulation could act as controls. This approach proved effective, and literature that followed this paper commonly used regulation as a “quasi-experimental” instrument.

The analysis finds that regulation is quite effective at reducing the number of listings, which, in turn, reduces home values and rents by an approximately equal percentage. The total effect of STRs on home values for Los Angeles in aggregate is a modest 3.6%, but this is because STRs are not popular in many areas. The effect is much more pronounced in popular tourist areas. This paper points out that there are distributional effects of restricting STRs, as owners lose substantial value.

### II.iii. Models that use both space and time dimensions in instruments

Building on the Koster, Ommeron, and Volkhausen spatial approach, Valentin (2021) attempts to disentangle the externality effect from the value of the option to rent in New Orleans by combining spatial discontinuities (within and without the French Quarter) and temporal discontinuities (before and after regulation).

Valentin finds a large effect, a 30% drop, on housing prices for properties located on the border of the most touristic area regulated. Further, it was found that regulating one part of a city displaces STRs to another. Partial regulation might, therefore, only be effective in introducing additional frictions. Total bans reduce housing prices in densely populated cities and tourist destinations. They speculate that this may eventually lead to lower rental rates as well. Valentin finds no negative externality associated with STRs as well, although the author concedes properties on the edge of the French Quarter may have already had negative externalities of tourism priced in.

Duso et al. (2020) examined the Berlin rental market and STRs after two different regulations took effect. Their approach to estimating STRs' effect on rent consisted of using the short time periods before and after policy enactments as instrumental variables, that is, variables that predict STR supply but not price and rental growth.

They find that STRs in Berlin are contributing \$0.07 per square meter of the rent, about 4% of the total rent increase between the different time periods. The effect of restrictions was most noticeable in marginal areas without a large base of existing STR units.

Finally, Gonçalves, Peralta, and Pereira dos Santos (2022) looked at a regulation in Lisbon that froze the number of new STRs in an effort to restrict the growth in house prices. The rules had an effect of decreasing overall house listing prices by 8%, but this effect was very highly concentrated in two-bedroom properties in the top quintile of homes. Moreover, house prices still increased nearly 70% over the sample period.





### III. Broad Observational Studies dimensions in instruments mensions in instruments account for unobserved effects

Although individual city studies using various instruments have the most compelling evidence so far published, a few attempts have been made to draw observational inferences from entire countries. An early (although officially published later than its findings were released) and influential study by Barron, Kung, and Proserpio (2021) found a similarly sized effect to the Sheppard and Udell paper. According to their study of the entire U.S., STRs could account for perhaps 20% of rent growth and 14% of home price appreciation from 2012–2015. The share of owner-occupier hosts also matters, with larger shares dulling the effect. A conclusion is that owner-occupied properties may not be a good target for effective regulation.

As in the literature focused on cities, subsequent national studies found smaller effects. A study by Tourism Economics (2019) attempting to decompose the growth in housing prices by various drivers found that, when accounting for earnings and unemployment, STR growth could only account for about 1% of home price appreciation between 2015–2018. Rent driven by STR growth also only accounted for a \$2.00 growth in monthly rent over the same period.

The authors of the Tourism Economics study note that Barron, Kung, and Proserpio did not try to control for unobserved popularity factors, biasing estimates upward. This is a similar argument made by the second line of city research that motivated various instruments. Tourism Economics used tourism-specific expenditures in an attempt to control for “popularity”. The conclusion is

that structural factors in place limiting housing supply for a period starting decades prior to the advent of Airbnb have contributed much more strongly to housing inequity.

Ayoub et al. (2020) attempt to characterize the effects of STRs on 15 French cities. Among them, STRs only consistently affect rent in Paris. The effect is increased and greater when looking exclusively at “professional hosts” that have three or more rentals and let at least 120 nights a year. In Paris, the share of rentals as second homes blunts the effect of STRs on rents. In any case, the effects of STRs are varied from city to city, and the authors conclude that regulations should be tailored locally. Although national in scope, this study also helps contextualize the studies of individual cities as well. Many of the city studies take data from highly urbanized areas with significant tourism draw. Ayoub et al. suggest that these types of locations likely have the strongest STR effect on home values and rents.

The Guardian’s data blog sponsored an observational study of Australian home prices (2022), and it is the only broad study that looks at the quick acceleration of housing costs contemporaneous with the effects of the COVID-19 pandemic. The study notes migration patterns, remote work driving interest in less urban areas, and faltering pandemic construction as causes for the increase. Meanwhile, STR density had no observed correlation. The study also concludes that many STR units in Australia would be vacant for much of the year if renting them was outlawed.

## IV. Distributional Effects

Several of the city studies noted that the effect of STRs on housing prices, particularly in the case of the studies where regulation reducing STRs was used as an instrumental variable, stems from the option value of being able to let the property. In some cases, this was also found to translate into rental rates, where the second-best option is to let the property on the long-term rental market if STRs are prohibited.

On the other hand, homes that do not move to the long-term rental market may sit empty, representing a loss of economic value being produced. This could especially be true of homes in vacation resorts or highly touristic areas where there is strong seasonal interest and demand for short-term stays makes up a significant portion of the total housing market.

In either case, regulations prohibiting STRs result in a loss of value for homeowners if the option value to let on the STR market is present. If not, the regulations will not have a binding effect, as the home will not be let anyway.

The justification for regulation can either be to provide housing justice and equity or, as in the spirit of the original Sheppard and Udell paper, to reduce negatives associated with STRs. Aside from Sheppard and Udell's finding that negative effects were outweighed by positives, Valentin's finding of no negative STR externality, and the general consensus in the literature that, while small, the effect of STRs on prices is positive, suggests that negative externalities on home values must be smaller than the positive.

Investigation specifically into STRs' negative effects is still somewhat nascent, but crime is an effect that has received some attention. Two recent studies provide

an interesting, if ambiguous, finding on STRs' effect on crime. Xu, Pennington-Gray, and Kim (2019) examined Florida STR markets and crime and found that while high densities of shared-room units were positively related to crime, private room and entire home unit density actually was associated with lower crime. This finding was reproduced in Austin two years later by Jeffrey Roth (2021). This suggests that regulations limiting STRs to reduce crime will give mixed results at best and more likely would be counter-productive. The former justification, equity, then remains as a possible candidate.

Higher home prices will only translate into higher rents in the case where there is substitutability between the STR and long-term rental markets. To put it more simply, if regulating away STRs only results in former STR properties being vacant, there will be no appreciable impact on rental rates, and the regulation will only result in a destruction of some economic value. However, the previous studies already mentioned have found increases to rents in some cases. The proposed policy should then examine to what degree a market is likely to have STR long-term substitutability. One potential way of doing so is to examine the types of markets that are more likely to have homes that are vacant for some part of the year.

The U.S. Census collects data on vacant homes through the American Community Survey. The 2020 5Y American Community Survey pertaining to vacancy status conducted at the census tract level provides the estimated number of housing units that are designated as seasonal, recreational, or occasional use (SRO). Using these estimates, we were able to associate the estimated census tract values of the vacant units and SRO units







to the zip code level across the United States using the weighted value of residential addresses that reside within a census tract per zip code.

The SRO ratio per zip code was then developed by dividing the number of seasonal, recreational, and occasional use residences by the total number of vacant units within a zip code. Mapping the SRO ratio across the United States yields a rather insightful image. Hot spots, where the SRO ratio is highest, can be seen predominantly in the nation's most popular vacation rental markets. Though for context, on average across all U.S. zip codes, the occupancy rate is estimated to be 86.2%, while 30.7% of vacant units are designated as SRO.

U.S. mountain/lake and coastal vacation destinations tend to have the greatest number of vacant housing units relative to total residences, in addition to the greatest number of SRO units. For instance, 80424, the zip code for Breckenridge, CO, is estimated to have roughly 7,512 housing units, 5,004 of which are considered vacant, and 4,668 of the vacant units are designated as SRO. This indicates that two-thirds of the units in 80424 are vacant, and 93.3% of the vacant units are SRO. Historically known as a tourist hub, if Breckenridge were to totally ban STRs, it would effectively eliminate over \$200M of the revenue brought into the community annually through STRs. Further ramifications of an outright ban include an adverse impact on the value of long-term investments, a reduction of employment opportunities, and a majority of residential real estate left vacant.

Not to be remiss, the housing pressures in many mountain tourist communities have grown. Though, it's more plausible that a lack of infrastructure for local workforce

housing is to blame over short-term rentals. This was well-documented by HR&A (2022) in the Colorado Short Term Rental Impact Study (2022), which conducted an analysis of the impacts of short-term rentals on five mountain counties in Colorado. The study focused on included Eagle, Grand, Pitkin, Summit, and Routt counties, which encompass popular ski destinations such as Aspen, Breckenridge, Steamboat Springs, Vail, and Winter Park. HR&A found that across the five counties, the housing inventory (including units left vacant for seasons and recreational use) grew by 8% from 2010 to 2019, compared to 17% overall job growth in the same period.

A common fallacy is that long-term housing is being converted to STRs, thereby detracting from existing housing inventory. However, evidence within HR&A's analysis indicates that approximately 3% of existing STR inventory was comparable to workforce housing between the five counties. The study found that the number of seasonal/recreational/occasion use units closely resembles the figures listed on STR platforms, indicating that the existing STR inventory has historically been used as tourism-related lodging or was occupied part-time. Additionally, the vacancy rate has actually decreased from 48% in 2010 to 44% in 2019. This further suggests that year-round housing units are not being converted to STRs at a high rate. Rather, long-term housing inventory growth has not kept pace with STR growth.

Furthermore, few long-term housing options exist on the market in these Colorado mountain communities that are available at a rate that is within the realm of affordability of the average tourism-related industry worker. The HR&A study found that only 3 of 267 total rental listings in the counties on Zillow were in the range affordable to low- to

moderate-wage workers.

Another consideration for whether regulation will affect housing affordability is whether the properties affected are those likely to be used marginal entrants to the housing market and low-income renters. Research specifically on the distribution of STR effects is more limited than those studies looking for an indiscriminate effect, but the existing studies are much in agreement. Calder-Wang (2021) examines New York rents to look at the distribution of changes and finds that the increases to rent due to STR increases fall mostly on higher-income and better-educated renters. This coincides with the findings of the previously mentioned study by García-Lopez et al. that shows rent increases predominantly in the wealthier, highly touristic areas and the Gonçalves, Peralta, and Pereira dos Santos study that saw the effect of STRs take place mainly in the top quintile of properties.

Besides negative externalities and housing price effects, there is evidence that STR presence also has positive externalities for the areas they locate in. In particular, new housing constructions motivated by the additional option value may expand long-term housing availability, even if they increase short-term rents. Bekkerman et al. (2022) look at Los Angeles before and after STR regulations and find the effect of the less restrictive STR market was to increase new unit construction permits by 9% and additions to existing unit permits by 17%. The authors state straightforwardly, “demand for STRs has been driving the creation of extra housing capacity in L.A., and it’s been especially driving growth for housing that is suitable for home-sharing.” In addition, the paper makes note of lost tax revenues attributable to lower home values, which ostensibly could have been spent on housing affordability initiatives.

More conventional tourism-related economic impacts can be attributed to the STR market as well, particularly in locations without considerable spare hotel capacity. Basuroy, Kim, and Proserpio (2020) estimate that 12% of median revenue growth for Texas restaurants is attributable to STR growth, for example. Their study found that the effects were even stronger for independent restaurants and restaurants without already existing heavy commercial activity, indicating that STRs helped fill a niche in smaller venues where there was no significant hotel presence.

Turning to larger-scale economic effects, a recent study by Tourism Economics (2021) for the Palm Springs DMO estimated 138,000 fewer visitors and over \$100 million in lost revenue annually. This reduction in direct spending, in turn, would incur additional business, job, and tax revenue losses. Examining the historical performance of 10 cities that already had enacted STR restrictions produced an estimate of a combined \$380 million loss over a 24-month period.



## V. Conclusions

Significant developments have occurred very recently in the literature examining the effect of the STR market on the corresponding long-term rental and housing market. Although home-sharing and STRs are not new concepts, digital tools such as Airbnb and Vrbo have made the practice much more widespread and convenient, spurring both enthusiasm and anxiety. A simultaneous increase in home prices that began in 2011 but greatly accelerated post-pandemic raised the question of whether this new technology might be an important cause of declining housing affordability.

Although initial research reported a moderately sized, general effect, later studies using more sophisticated approaches have found that the effect of STR on housing prices is smaller than the initial study would suggest, localized in highly touristic areas, and most likely to affect up-market assets and renters. These effects certainly merit attention in their own right, but it is difficult to conclude that restricting STRs is an effective policy tool to address housing affordability, particular for low-income households. Moreover, there is no strong evidence that restricting or banning STRs would lessen crime or make neighborhoods more desirable.



## Works Referenced

- Ayouba, Kassoum, Marie-Laure Breuillé, Camille Grivault, and Julie Le Gallo. "Does Airbnb disrupt the private rental market? An empirical analysis for French cities." *International Regional Science Review* 43, no. 1-2 (2020): 76-104.
- Barron, Kyle, Edward Kung, and Davide Proserpio. "The effect of home-sharing on house prices and rents: Evidence from Airbnb." *Marketing Science* 40, no. 1 (2021): 23-47.
- Basuroy, Suman, Yongseok Kim, and Davide Proserpio. "Estimating the impact of Airbnb on the local economy: Evidence from the restaurant industry." Available at SSRN 3516983 (2020).
- Bekkerman, Ron, Maxime C. Cohen, Edward Kung, John Maiden, and Davide Proserpio. "The effect of short-term rentals on residential investment." *Marketing Science* (2022).
- Calder-Wang, Sophie. "The distributional impact of the sharing economy on the housing market." Available at SSRN 3908062 (2021).
- Duso, Tomaso, Claus Michelsen, Maximilian Schäfer, and Kevin Ducbao Tran. "Airbnb and rents: Evidence from Berlin." DIW Berlin Discussion Paper No. 1890 (2020).
- Garcia-López, Miquel-Àngel, Jordi Jofre-Monseny, Rodrigo Martínez-Mazza, and Mariona Segú. "Do short-term rental platforms affect housing markets? Evidence from Airbnb in Barcelona." *Journal of Urban Economics* 119 (2020): 103278.
- Gonçalves, Duarte, Susana Peralta, and Joao Pereira dos Santos. "Short-term rental bans and housing prices: Quasi-experimental evidence from Lisbon." Working paper (2022).
- Horn, Keren and Mark Merante. "Is home sharing driving up rents? Evidence from Airbnb in Boston." *Journal of Housing Economics* 38 (2017): 14-24.
- HR&A Advisors. "Colorado Short Term Rental Impact Study." Report prepared for Airbnb. May 31, 2022. [https://news.airbnb.com/wp-content/uploads/sites/4/2022/06/STR-Colorado-Impact-Study\\_Final\\_05.25.2022.pdf](https://news.airbnb.com/wp-content/uploads/sites/4/2022/06/STR-Colorado-Impact-Study_Final_05.25.2022.pdf)
- Koster, Hans RA, Jos Van Ommeren, and Nicolas Volkhausen. "Short-term rentals and the housing market: Quasi-experimental evidence from Airbnb in Los Angeles." *Journal of Urban Economics* 124 (2021): 103356.
- Nicholas, Josh. "Rent is skyrocketing in Australia. Is Airbnb responsible for driving up prices?" *The Guardian*. September 11, 2022. <https://www.theguardian.com/news/datablog/2022/sep/12/australias-rental-prices-are-skyrocketing-so-why-were-1m-homes-empty-on-census-night>.
- Roth, Jeffrey J. "Home sharing and crime across neighborhoods: an analysis of Austin, Texas." *Criminal Justice Review* 46, no. 1 (2021): 40-52.
- Sheppard, Stephen, and Andrew Udell. "Do Airbnb properties affect house prices?" *Williams College Department of Economics Working Papers* 3, no. 1 (2016): 43.
- Todd, James, Anwar Musah, and James Cheshire. "Assessing the impacts of Airbnb listings on London house prices." *Environment and Planning B: Urban Analytics and City Science* 49, no. 1 (2022): 206-222.
- Tourism Economics. "The drivers of housing affordability: an assessment of the role of short-term rentals." September 20, 2019. <https://www.oxfordeconomics.com/resource/the-drivers-of-housing-affordability/>
- Tourism Economics. "Analysis of Policy Restrictions on Short Term Rentals." Report prepared for Visit Greater Palm Springs. September 2022. <https://www.visitgreaterpalmsprings.com/partnerportal/research-reports/>
- Valentin, Maxence. "Regulating short-term rental housing: Evidence from New Orleans." *Real Estate Economics* 49, no. 1 (2021): 152-186.
- Xu, Yu-Hua, Lori Pennington-Gray, and Jinwon Kim. "The sharing economy: A geographically weighted regression approach to examine crime and the shared lodging sector." *Journal of Travel Research* 58, no. 7 (2019): 1193-1208.

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