LEAVE THE DATA, TAKE THE MONEY? HARD CHOICES IN PLATFORM REGULATION, UNDERSTOOD THROUGH AIRBNB

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Eleanor Wilking*

Firms play a central role in the study of tax enforcement, both as objects of taxation and for their vital role in the efficient collection of individual tax liabilities. In this latter capacity, firms assist the government in two primary ways: first, by supplying information on individuals' earnings, and second, by remitting individual tax liabilities to the government through withholding ("tax collection"). Though these functions are often coincident, they can exist independently. Much of the recent literature and policy making in tax enforcement has focused on the use of information reporting to combat tax evasion. But information alone is of limited value if the state's collection ability is limited.

This paper critically examines the consensus around information reporting in the context of taxing digital platform firms. Specifically, I focus on cities' efforts to collect hotel taxes on transactions facilitated by short-term rental firms like Airbnb. After conventional attempts to recoup lost hotel tax revenue stalled, many cities turned to an unusual tool: voluntary collection agreements (VCAs). These VCAs deputized firms like Airbnb to remit hotel taxes on behalf of hosts but did not require them to share data on individual taxable transactions with cities. In this way, VCAs decoupled the information reporting and collecting functions firms often perform to facilitate efficient tax collection.

While having firms both report information and collect taxes is likely the optimal policy in most contexts, I argue that there are circumstances in which collection without information reporting is the only realistic path to tax revenue collection in the medium run. However, this option may come at a high price for governments, as it is detrimental to their efforts to enforce non-tax regulations and potentially undermines revenue collection efforts in the long run.

* Assistant Professor, Cornell Law School. Comments addressed to ewilking@cornell.edu are most welcome; all mistakes are my own.

INTRODUCTION

Tax scholars and policy makers have long appreciated the centrality of firms to the functioning of nearly all tax systems. Firms are clearly indispensable to Value Added Tax (VAT) and retail sales tax systems. Yet firms are no less necessary for an effective income tax system. A firm can play multiple roles in enforcing individual tax liability: reporter and collector.[1]

These two roles are typically performed together by a firm. But they are separable, and this separability is understudied in both legal scholarship and in the public finance literature in economics. While a firm's reporter role is relatively well documented, its role as collector—particularly in the absence of information reporting—is not. However, the separate role of a firm as a tax collector is likely to become increasingly relevant as under-resourced state and local governments seek to collect taxes from digital platform firms with rapidly growing economic and political power.[2]

Platform firms such as Uber and Airbnb have rapidly changed how goods and services are purchased and how labor is sold. Much of these firms' value surely derives from the real economic surplus they help create, such as by facilitating mutually beneficial transactions that would not have occurred otherwise. However, these firms also derive significant value and market advantage over their non-platform competitors by engaging in regulatory arbitrage, such as the avoidance or evasion of taxes, consumer safety regulations, and labor laws.

Policy makers have struggled to eliminate regulatory arbitrage in the platform economy using conventional approaches. One unconventional approach gaining popularity is an arrangement under which platform firms collect a specific type of tax liability on a government's behalf, without reporting information on the individual taxpayers. The decoupling of the information reporting and collection roles for platform firms

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1 Note that, while the actions of withholding and remitting are distinct, in practice there is no withholding without remittance. Therefore, I use the term "collection" to refer to them jointly.

2 This argument also applies to tax collection in developing countries. Like many local governments in the U.S., governments in developing countries often have few enforcement resources and are more vulnerable to capture (see, e.g., India, where there is no income tax and the state is entirely reliant on VAT revenues).

creates truly novel regulatory challenges, particularly for local governments.

This Article studies this dynamic and presents evidence from one of the largest platform firms: Airbnb. In response to Airbnb's rapid expansion and the resulting loss of hotel tax revenue, over 250 U.S. cities have signed Voluntary Collection Agreements (VCAs) with the firm, obligating it to remit taxes on behalf of hosts on the platform.[3] I first discuss the structure and motivating logic of VCAs, which require city governments to make several concessions. The most important of these concessions, I later argue, is the inability to access transaction-level data for hosts on the platform.

Next, I ask what prompted so many American cities to negotiate with Airbnb in this way? Using data from Airbnb, the hotel industry, and city government budgets, I empirically explore the economic, legal, and political characteristics of Airbnb's business model—characteristics common to many platform firms—that make it harder to regulate than traditional hotels.

With a better understanding of why VCAs are adopted, I then turn to estimating their effects. I focus on both direct effects on tax revenue collection and indirect effects that may ultimately diminish tax collection efficacy, such as whether VCAs cause Airbnb hosts to switch platforms to evade taxation. Using a difference-in-differences design, I find that VCAs significantly increased cities' hotel tax revenues. However, I also find suggestive evidence that many hosts switched to VRBO, Airbnb's primary competitor.

After documenting the backlash to VCAs by some cities, I discuss the conditions under which signing a VCA may still be the best course. Finally, I suggest concrete strategies that municipal regulators should adopt to better meet future platform entry into new industries.

I. EMPIRICAL CONTEXT: AIRBNB VCAS

This section describes Airbnb VCAs, the empirical setting for the remainder of this Article. This section provides basic information about Airbnb VCAs, their adoption dynamics, and the

3 Andrew J. Bibler, Keith F. Teltser & Mark J. Tremblay, *Inferring Tax Compliance from Pass-Through: Evidence from Airbnb Tax Enforcement Agreements*, 103 REV. ECON. & STATISTICS 636 (2021).

various datasets that will be used to generate the descriptive and causal findings that follow.

A. POLICY

Hotel taxes, also referred to as "occupancy taxes" or "short-term occupancy taxes," are levied by many U.S. cities on hotel stays. They are structured and effectively operate as a special retail tax, imposed in addition to the local sales tax, and calculated as a percentage of the purchase price.[4] Each city defines what constitutes a short-term stay, but most restrict it to stays shorter than six weeks. Cities also set the rate of hotel taxes, which can range from 3% (Phoenix, AZ) to nearly 17% (Washington, DC). These taxes are nominally assessed on the consumer (the hotel guest) but in practice are collected by the hotel and sent monthly to the city's revenue department. Until the entry of digital platform firms, this system was straightforward; it was considered a relatively stable source of revenue for annual budgeting and enjoyed the support of local policymakers, likely because the tax was levied on tourists rather than city voters.

Airbnb is the largest firm facilitating short-term, peer-to-peer residential space rentals through an online platform. The firm was started in 2008 as an online marketplace to connect couch surfers and initially represented a negligible share of the aggregate hotel market. However, Airbnb has experienced remarkable growth in recent years, with listings expanding exponentially in popular tourism destinations around the globe.[5]

As Airbnb grew, so did city administrators' frustration with Airbnb hosts' avoidance of hotel taxes. In cities with significant levels of tourism, the estimated loss of hotel tax revenue was substantial. Initially, Airbnb's position was that its rentals were not subject to hotel taxes because transactions were "peer-to-peer" rather than commercial in nature. In May 2014, the company officially retracted this view and announced that it believed its hosts were responsible for paying hotel taxes to local governments. It also amended its "Terms of Service" agreement to inform hosts of their obligation to research and comply with applicable local

4 In this regard, hotel taxes are like "sin taxes" levied by local government on products such as alcohol and cigarettes.

5 Paris is thought to have nearly 40,000 active Airbnb listings, the most of any city in the world.

taxes and regulations.[6] Predictably, few hosts complied, and Airbnb began to negotiate.

On June 28, 2014, Airbnb announced that it had reached an agreement with the city of Portland, OR to collect an 11.5% hotel tax on all reservations booked on its site, and to remit these taxes to the city at the end of each quarter. Crucially, the agreement explicitly prohibited Portland from requiring Airbnb to disclose information related to taxable transaction that could individually identify hosts. As part of the exchange, the Portland City Council agreed to pass a code revision that would legalize short-term home rentals if residents obtained a $180 permit and installed fire alarms.

Between August 2014 and August 2016, similar agreements to collect and remit hotel taxes were signed with San Francisco, CA (14.5%), San Jose, CA (10%), Chicago, IL (4.5%), Washington, DC (16.75%), Philadelphia, PA (8.5%), Durham, NC (6%), San Diego, CA (10.5%), and Phoenix, AZ (3%), as well as several smaller municipalities. Typically, an agreement was announced two weeks before the date when Airbnb began collecting taxes on all bookings in that jurisdiction. Airbnb notified affected hosts via email shortly after the announcement. To date, Airbnb has signed VCAs with over 275 jurisdictions across the U.S.

Though there are differences between individual VCAs, they share some features in common. Each VCA is a bilateral contract, agreement, or written understanding signed by Airbnb and a government that stipulates conditions under which the firm will pay or assist in the collection of hotel taxes from a third party (a host) despite having no *legal obligation* to do so. Several of these agreements have been made public, and most share four types of clauses[7]:

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6 Beginning May 1, 2014, Airbnb's Terms of Service includes the following paragraph:

YOU AS A HOST UNDERSTAND AND AGREE THAT YOU ARE SOLELY RESPONSIBLE FOR DETERMINING (I) YOUR APPLICABLE TAX REPORTING REQUIREMENTS, AND (II) THE TAXES THAT SHOULD BE INCLUDED, AND FOR INCLUDING TAXES TO BE COLLECTED OR OBLIGATIONS RELATING TO APPLICABLE TAXES IN LISTINGS. YOU ARE ALSO SOLELY RESPONSIBLE FOR REMITTING TO THE RELEVANT AUTHORITY ANY TAXES INCLUDED OR RECEIVED BY YOU. AIRBNB CANNOT AND DOES NOT OFFER TAX-RELATED ADVICE TO ANY MEMBERS.

7 *See, e.g.*, VCAs for Sonoma County, CA, Mariposa County, CA, and Union City, CA.

1. Tax liability. Airbnb will be held legally responsible for failure to report, collect, or remit hotel taxes.

2. Aggregate and/or anonymized auditing. The tax authority agrees to audit Airbnb based on its tax returns, rather than the individual hosts unless, and until an audit of Airbnb has been exhausted with the matter unresolved. Any host data reviewed by the tax authority will be anonymized.

3. Back taxes. The tax authority agrees not to pursues any action to recover unpaid taxes that had been due before the date the VCA went into effect.

4. Statute of limitations. Limits the amount of time in which Airbnb can be audited.

These agreements also frequently include concessions by the government entity for the assistance rendered, including but not limited to legalization of short-term rentals outside of designated areas and avowals not to solicit host-identifying information through Airbnb.

Airbnb implemented these collection agreements as follows. When a guest searches for a rental on Airbnb, she is presented with a set of search results that includes an image, location, and tax-exclusive estimate of the nightly fee for each listing (Figure 2.1).[8] After a guest clicks on a listing, she is shown a more detailed accounting of the rental cost, including Airbnb's service fee and any hotel tax. Figure 1.2 shows examples of listings from two jurisdictions: one that has a VCA with Airbnb (Chicago, IL), and one that does not (Evanston, IL). While not explicitly relevant for this Article, it is worth noting that Airbnb made no effort to make taxes salient to consumers—without clicking on a listing, it is not evident whether a hotel tax applies to it.

8 The price shown in the search results is the average cost per night of the room, excluding taxes and Airbnb's service fee. For example, if a listing's rental prices for Friday, Saturday, and Sunday are \$90, \$100, and \$110, respectively, and the listing has a \$30 cleaning fee, then the price displayed in the search results will be \$110 (90+100+110+30 / 3 = 110).

Figure 2.1 Airbnb search results

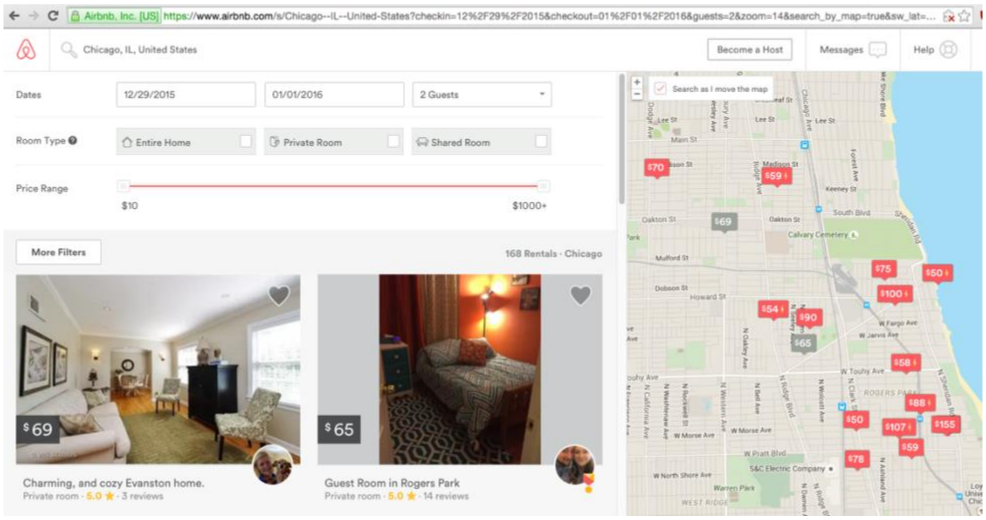
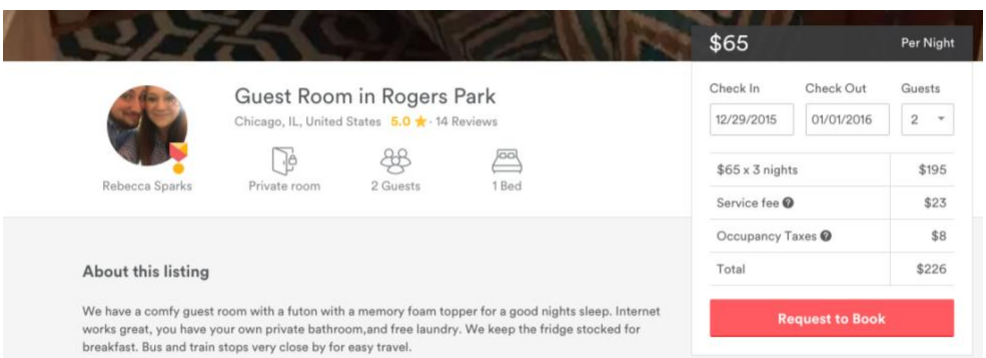
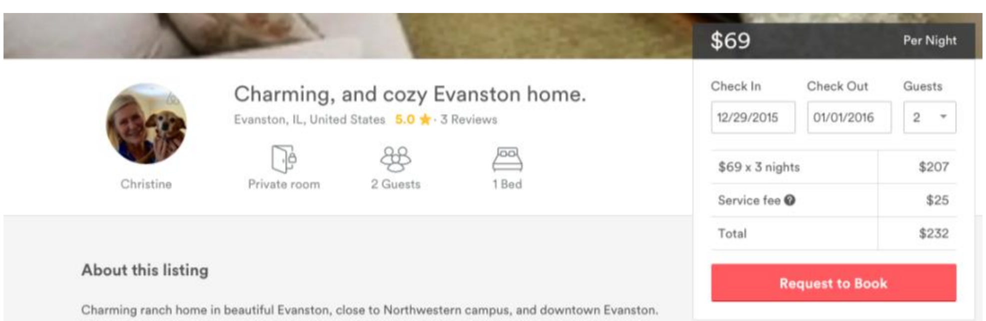


Figure 1.2 Airbnb listing details in Chicago and Evanston, IL



Chicago, IL



Evanston, IL

B. DATA

My analysis uses multiple datasets. Below, I describe each dataset's source and features, and then discuss descriptive analysis of hosts' price-setting behavior.

Airbnb Listings Data. To measure the response of hosts to Airbnb VCAs, I collected information on listings for selected U.S. cities and their surrounding areas from December 2014 through August 2016. I focused my data collection on cities with large tourisms sectors and those that had announced, but had not yet implemented, Airbnb VCAs. In total, 20 cities enacted agreements during the period of data collection (see Table 2.1 for a list of enactment dates). I also collected listing data for five cities that did not enact VCAs during this period—these cities serve as pure controls. In addition to listings within each city itself, I also collected data on listings in the metro areas (MSAs) to which the implementing cities belong.

The data contain information on listings observed at multiple points in time. For each listing observation, the data include the listing's approximate geographic coordinates, price, unit type (e.g., shared, private room, entire home), number of reviews, and whether it can be booked instantly. Listings and hosts are each identified by a unique ID, facilitating the tracking of listings and hosts over time.

Table 2.1 Airbnb VCA Enactment Dates 2014-2016

City	Tax Rate	Announcement Date	Implementation Date	Metropolitan Statistical Area
Treatment				
Boulder, CO	7.5		October 1, 2016	Boulder, CO Metro Area
Chicago, IL	4.5	February 1, 2015	February 15, 2015	Chicago-Naperville-Elgin, IL-IN-WI Metro Area
Cleveland, OH	3	June 20, 2015	July 1, 2016	Cleveland-Elyria, OH Metro Area
Washington D.C.	14.5	February 1, 2015	February 15, 2015	Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area
Golden, CO	7.5		November 1, 2016	Denver-Aurora-Lakewood, CO Metro Area
Kill Devil Hills, NC	6.75	May 23, 2015	June 1, 1915	Kill Devil Hills, NC
Jersey City, NJ	6	October 12, 2015	February 1, 2016	New York-Newark-Edison, NY-NJ-PA Metropolitan Statistical Area
Los Angeles, CA	14	July 18, 2016	August 1, 2016	Los Angeles-Long Beach-Anaheim, CA Metro Area
Malibu, CA	12		April 20, 2015	Oxnard-Thousand Oaks-Ventura, CA Metro Area
Newark, NJ	14.5	April 12, 2016	May 1, 2016	New York-Newark-Jersey City, NY-NJ-PA Metro Area
Oaks Island/Myrtle Beach	6.75	May 23, 2015	June 1, 2015	Myrtle Beach-Conway-North Myrtle Beach, SC Metropolitan
Oakland, CA	14	July 5, 2015	July 15, 2015	San Francisco-Oakland-Hayward, CA Metro Area
Palo Alto, CA	14	November 30, 2014	January 1, 2015	San Jose-Sunnyvale-Santa Clara, CA Metro Area
Philadelphia, PA	8.5	July 1, 2015	July 15, 2015	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area
Portland, OR	11.5		July 1, 2014	Portland-Vancouver-Hillsboro, OR-WA Metro Area
Phoenix, AZ	5	July 1, 2015	July 1, 2015	Phoenix-Mesa-Scottsdale, AZ Metro Area
Santa Clara, CA	9.5		November 1, 2015	San Jose-Sunnyvale-Santa Clara, CA Metro Area
San Diego, CA	10.5	July 1, 2015	July 15, 2015	San Diego-Carlsbad, CA Metro Area
San Francisco, CA	16.5	August 1, 2014	October 1, 2014	San Francisco-Oakland-Hayward, CA Metro Area
San Jose, CA	10	January 1, 2015	February 1, 2015	San Jose-Sunnyvale-Santa Clara, CA Metro Area
Control				
Austin, TX	0	NA	NA	Austin-Round Rock, TX Metro Area
Dallas, TX	0	NA	NA	Dallas-Fort Worth-Arlington, TX Metro Area
Houston, TX	0	NA	NA	Houston-The Woodlands-Sugar Land, TX Metro Area
New Orleans, LA	0	NA	NA	New Orleans-Metairie, LA Metro Area
Savannah, GA	0	NA	NA	Savannah, GA Metro Area

Data were collected in multiple waves, based on the implementation dates of VCAs. To supplement these collection efforts, I purchased additional listing data from Airdna, a firm that collects Airbnb listing data.

Table 2.2 contains descriptive statistics for treatment and control cities. Column 1 provides the number of unique listings in the city's MSA, while Column 2 contains the number of listings located within the boundaries of the indicated city. The remaining columns describe the average characteristics of listings in the MSA.

Table 2.2. Summary Statistics of Airbnb Listings Data

City	N (Metro)	N (City)	N (Listing X Days)	Avg. Price	Avg. No. per Month per Host: Price Changes	Avg. No. per Month per Host: Reservations	Entire Apt. (%)
Treatment							
Boulder, CO	3,657	2,446	193,878	143	2.9	4.9	24.1%
Chicago, IL	21,453	18,786	682,957	139	3.6	4.6	54.0%
Cleveland, OH	4,065	1,926	128,975	467	1.8	2.4	34.3%
Washington D.C.	22,401	11,904	769,856	148	3.0	4.9	51.8%
Golden, CO	12,927	112	373,278	124	3.6	5.4	29.8%
Kill Devil Hills, NC	151,370	3,993	2,064,362	170	1.6	4.3	81.4%
Jersey City, NJ	2,967	850	125,898	207	3.3	4.5	16.6%
Los Angeles, CA	87,598	51,793	2,437,104	198	3.5	5.0	49.2%
Malibu, CA	89,913	685	510,603	711	3.5	4.1	31.7%
Newark, NJ	151,370	503	876,406	161	1.6	4.6	77.0%
Oak Island, NC	3,454	467	106,225	198	2.7	3.9	10.6%
Oakland, CA	21,669	4,815	1,849,500	178	1.8	5.2	34.4%
Palo Alto, CA	14,720	1,813	1,323,801	415	2.1	3.9	33.0%
Philadelphia, PA	17,664	13,979	1,847,512	491	1.1	2.6	35.3%
Portland, OR	10,727	7,810	437,326	123	4.0	6.2	24.0%
Phoenix, AZ	12,219	4,438	505,783	329	2.7	3.8	22.9%
Santa Clara, CA	7,696	1,729	711,486	467	2.0	3.6	33.4%
San Diego, CA	21,096	14,995	686,205	219	3.8	4.4	29.9%
San Francisco, CA	47,623	25,954	5,558,380	218	1.7	5.2	45.7%
San Jose, CA	12,907	5,211	1,056,904	454	2.0	3.6	33.3%
Control							
Austin, TX	21997	19,250	949,109	277	3.3	3.6	25.9%
Dallas, TX	7823	3,710	274,168	142	3.5	4.7	47.6%
Houston, TX	12726	8,497	409,408	239	2.8	3.0	37.1%
New Orleans, LA	10539	9,723	424,294	187	4.3	4.6	29.2%
Savannah, GA	1847	1,082	66,989	235	5.7	6.7	22.8%

II. WHY TAX AIRBNB?

Underlying much of the debate around whether and how to regulate Airbnb and similar short-term rental (STR) platforms are disagreements about surplus: how much is created, how it is created, and to whom it accrues. Airbnb undeniably facilitates transactions that otherwise would not have occurred, benefiting consumers and owners of under-utilized capital—"real economic surplus." But some of the surplus resulting from Airbnb transactions is a direct result of "regulatory arbitrage"—surplus created by Airbnb providing a close or even perfect substitute for hotel rooms without having to abide by the extensive regulations to which hotels are subject. In this section, I discuss the sources of both types of surplus, the problems associated with regulatory arbitrage, and the vexing difficulty policymakers face in distinguishing between the two.

A. Real Economic Surplus

Here, I present the strongest arguments for cities to limit taxation and generally encourage use of the platform.

More choice generally increases consumer welfare. One intuitive way in which Airbnb generates real surplus is by expanding the choice set of short-term lodgings available to consumers. Airbnb does this not just by increasing the supply of such lodgings beyond that provided by hotels; it also expands the product space by offering materially different alternatives to standard hotel rooms. This increase in both the quantity and diversity of options available to consumers increases their welfare.

This point can be illustrated concretely with descriptive evidence from scraped Airbnb listings data. There are numerous ways in which the average hotel room and the average Airbnb rental differ, but one of the most salient is the amount of privacy afforded. In a hotel, the level of privacy is relatively homogenous. A guest interacts on a limited basis with hotel staff and is entitled to a space with a bed and a bathroom to which they have exclusive access. In contrast, Airbnb allows users to search for listings that offer three distinct levels of privacy: an entire dwelling, an entire room, or a shared room. This additional choice might benefit consumers along distinct margins. A guest who finds a standard hotel room isolating and prefers more opportunities to interact with other people, or a guest who is willing to trade privacy for a lower price, might opt for a shared room or a private room within a shared dwelling. There is little scope for such a guest to have their preferences satisfied by a standard hotel—one cannot ask to be assigned a hotel room that is already occupied for a discount. But Airbnb reliably offers this arrangement. Airbnb also arguably offers a product with higher privacy than a traditional hotel room. Many “entire dwelling” properties are stand-alone, and some are in remote locations. However, this is more difficult to quantify in the data.

Table 3.1 Types of Airbnb listings, by city

City	Entire Dwelling	Private Room	Shared Room	Percent Hotel Al
NewOrleans	7,143	3,116	287	32.3%
Savannah	1,339	492	16	27.5%
Houston	8,602	3,797	334	32.4%
Dallas	4,405	3,096	334	43.8%
Austin	14,670	6,707	629	33.3%
Phoenix	8,609	3,428	190	29.6%
Cleveland	2,777	1,203	87	31.7%
Philadelphia	11,077	6,154	437	37.3%
Oakland	25,498	19,478	2,659	46.5%
SanFrancisco	25,498	19,478	2,659	46.5%
SanDiego	13,246	7,190	668	37.2%
Washington	12,316	9,286	930	45.3%
Chicago	11,012	6,325	952	39.8%
Boulder	2,124	1,463	71	41.9%
SanJose	6,563	6,778	1,380	55.4%
SantaClara	6,563	6,778	1,380	55.4%
Golden	6,661	4,541	526	43.2%
Malibu	51,709	31,884	4,718	41.4%
LosAngeles	51,709	31,884	4,718	41.4%
Newark	80,917	64,928	5,564	46.6%
JerseyCity	80,917	64,928	5,564	46.6%

Notes. Table 3.1 contains counts of Airbnb listings by type in each market (defined as the city and its surrounding MSA). The last column, Percent Hotel Alternative, is the share of listings with a type other than "Entire Dwelling," which affords the most similar level of privacy to that of a traditional hotel room.

Another illustration of product space expansion is the number of unique dwelling types. A consumer looking for a truly bespoke experience might consider booking a tipi, a recreational vehicle (RV), or a tree house. While the lack of standardization in dwellings might be problematic from a consumer safety perspective, the sheer variety of dwelling types available on Airbnb almost certainly enhances consumer preference satisfaction.

Table 3.2 Unique dwelling types on Airbnb: New York City

Apartment	Dorm	Nature lodge
Bed & Breakfast	Earth House	Parking Space
Boat	Entire Floor	Plane
Boutique hotel	Guesthouse	Serviced apartment
Bungalow	Hostel	Tent
Cabin	House	Timeshare
Camper/RV	Hut	Tipi
Castle	Igloo	Townhouse
Cave	Island	Train
Chalet	Lighthouse	Treehouse
Condominium	Loft	Villa

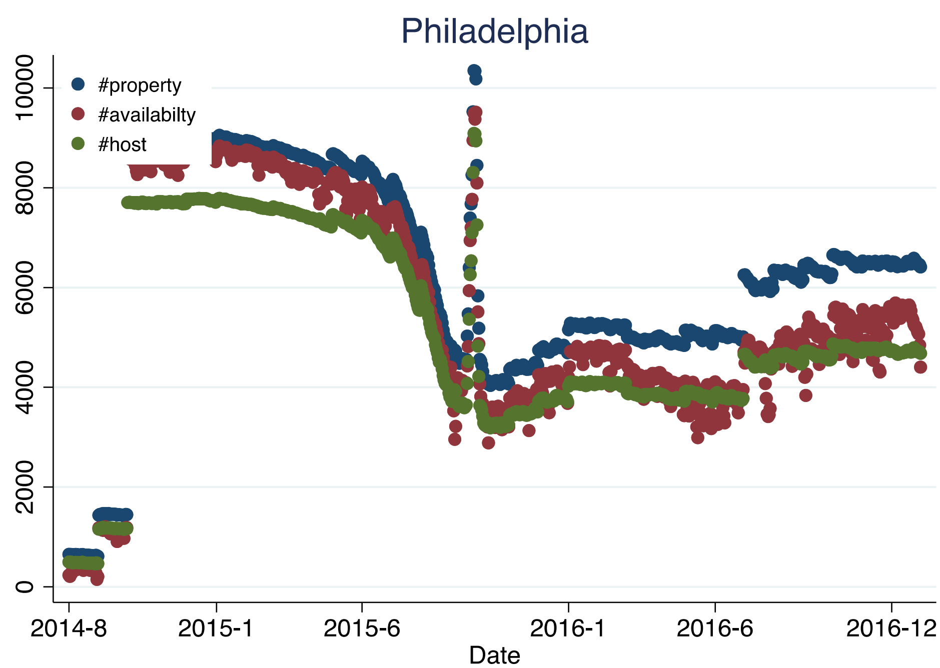
Notes. Table 3.2 contains a unique list of property types on Airbnb available in the New York City market. While the vast majority are apartments, some bespoke options would be hard or impossible to find in the traditional hotel market.

There are many other qualitative differences between Airbnb listings and hotel rooms, but it is clear that at least some listings facilitated by the platform do not have a counterpart in the traditional hotel market, and that the search and transaction costs for a consumer looking to book such an alternative space would be prohibitive in the absence of the platform.

Higher Returns to and Efficient Use of Capital. Airbnb almost certainly increases real surplus for producers, or "hosts," as well as guests. Airbnb's original insight was to create a market for residential properties that are partially or fully unoccupied, ranging from unused spaces in residences, to entire dwellings left temporarily vacant while their occupants are traveling, to empty vacation homes. To the extent that Airbnb achieves this vision and provides a market for capital that would otherwise have been unproductive, it would seem to increase real economic surplus. Table X presents the average earnings of hosts with shared spaces by city. While surplus was surely also created by entire dwellings left temporarily vacant being rented, it is also likely the case that properties were rented or purchased exclusively for use on Airbnb, an issue discussed further in Section 6, *infra*.

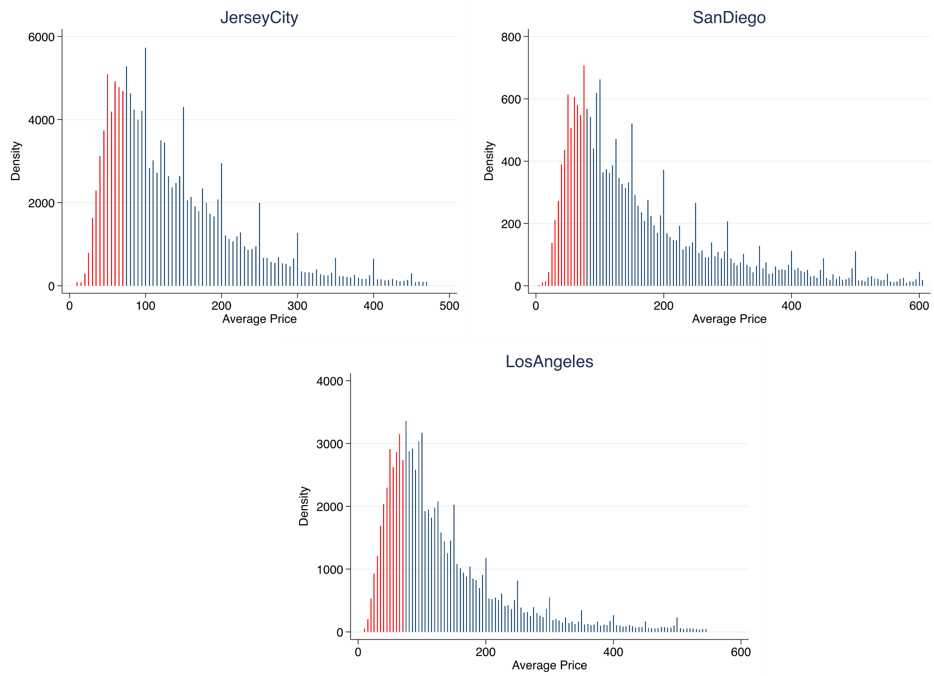
Another feature of Airbnb that likely creates real economic surplus is that, on any given date, residential space can be allocated to the party that places the highest value on it. In other words, this creates the potential for flexible capacity, unlike the static supply of hotel rooms. For example, on September 26 and 27, 2015, Pope Francis visited Philadelphia. The number of available listings on Airbnb increased sharply in the days leading up to his visit (Figure 3.1). Similar phenomena likely occur ahead of other high-demand events, such as the Super Bowl or a Presidential Inauguration.

Figure 3.1 Airbnb listings in Philadelphia around Pope Francis's visit



Increasing accessibility by expanding the low-cost market. Finally, just as Airbnb likely increased consumer welfare by expanding the product space to include STRs with varying levels of privacy, it also greatly expanded and diversified the set of low-cost STRs available to consumers. Figure 3.2 shows histograms of prices for both Airbnb listings and hotel rooms in three cities.

Figure 3.2 Histograms of Airbnb listing prices and hotel room prices in three cities



Notes. Jersey City includes listings in Jersey City, NJ and New York, NY.

These histograms strongly support the claim that Airbnb introduced options beneath the price floor offered by even popular budget hotel chains. For example, in 2018, rooms at the budget hotel Extended Stay America in New York City averaged $145/night at their Manhattan location and $115/night at their Jersey City, NJ location. In contrast, Airbnb made available thousands of options below both of those price points.

B. Surplus from Regulatory Arbitrage

While there are clearly arguments in favor of supporting responsible use of Airbnb's platform, these behaviors appear to violate the intent of various regulations and produce externalities for permanent residents.

Avoidance of hotel taxes. Many cities, particularly those with large tourism industries, rely on hotel tax revenues. These tax revenues can form a significant part of the cities' overall sales tax budgets. Hotel taxes are used to fund, among other things, infrastructure that directly supports the tourism industry: operating museums, maintaining beaches, and so on. They are also used to build or repair infrastructure used by both tourists and residents alike, such as transportation, to limit the crowding out of public goods for residents.

Historically, hosts on Airbnb have generally been unaware of their hotel tax liability and, as a byproduct, of their obligation to remit tax payments to the local government. This lack of awareness of, and preparedness to comply with, hotel taxes was mutual on the part of cities. Most cities' systems for accepting hotel tax payments were not built for or prepared to accept payments from a flood of amateur STR operators. The forms that taxpayers are required to complete are overly complicated, and the methods used to make payment are generally not user-friendly.

An end run around residential zoning. Most cities have separate zones for residential and commercial activity, with the latter sometimes including zones specifically for hotels and entertainment. In some cities, STRs are permitted in owner-occupied housing if they do not exceed a certain number of days per year (usually 14). If an Airbnb host does not comply with these regulations, then they effectively perform an end run around residential zoning. In doing so, the host derives an advantage that is unavailable to traditional hotels—the ability to offer STRs in residential locations where consumers may prefer to stay. Yet such non-compliant residential STRs likely create several externalities as well, including higher housing and rental costs, noise complaints, and security issues.

A prominent example of this phenomenon is San Francisco. The city has designated zones for "non-residential visitors" (hotels) in and around the downtown area. Yet, as Figure 3.3 shows, thousands of Airbnb listings in the city span across its residential neighborhoods.

Figure 3.3 Airbnb listings in San Francisco's residential zones

Notes. Airbnb listings are represented by black dots. Plots exclusively zoned for residential use are blue, plots for 'visitor lodging and entertainment' are red. White space represents mixed-use zoning.

Consumer Safety Regulations. Hotels are regulated to protect the guests who stay in them. Because hotel guests are often not local, they may face asymmetric information that would make it difficult to ascertain the quality of a hotel before choosing to stay in it. Hotel regulations are meant to address this potential market failure by establishing a floor for hotel quality: cleanliness, security, building codes (including fire alarms), accessibility for the disabled, and insurance.

In contrast, as with hotel taxes, hosts on Airbnb have generally been unaware of their need to comply with consumer safety regulations that pertain to STRs. Airbnb has also taken steps to stymie efforts by local governments to bring hosts' STRs into compliance. For example, in 2014, Portland, OR asked Airbnb to register each host with the city so that the city could ensure that each STR had a fire extinguisher in or near the kitchen. Airbnb declined to provide hosts' addresses to the city, fearing that inspectors would be perceived as invasive and would hamper Airbnb's growth in the city.

C. DIFFICULTY IN DISTINGUISHING SOURCES OF SURPLUS

It is difficult to disentangle or quantify the real economic surplus and surplus from regulatory arbitrage created by Airbnb. The types and magnitudes of surplus generated by specific hosts and listings are likely to differ substantially.

Consider a single host who manages a set of dedicated, interchangeable properties concentrated in a commercial area and who does not remit hotel taxes or comply with hotel regulations. Such a host is functionally operating an off-the-books hotel. He generates no economic surplus above and beyond what a similarly situated hotel would provide. But he engages in regulatory arbitrage by not complying with hotel taxes and regulations.

In contrast, consider a host who rents out her house in a residential neighborhood five times a year when she travels to visit her elderly mother, and who remits hotel taxes and complies with all hotel regulations. The guests to whom she rents her house respect the neighborhood and generate no negative externalities. The host uses her after-tax earnings from Airbnb to subsidize her mother's care. This host is very likely generating real economic surplus by providing a STR option that would not otherwise exist, without engaging in any regulatory arbitrage.

Even when an Airbnb listing is priced lower than the approximately equivalent hotel room—which is the case, on average, for 1 bedroom, 1 bathroom listings—it is not clear whether this is due to regulatory arbitrage. Such a pricing differential may arise because the host is not remitting hotel taxes and is passing some or all of the savings on to the consumer. It could be because Airbnb hosts are able to clean units themselves or hire non-unionized cleaning staff. Or it could be because an Airbnb rental and a hotel room are not substitutes, but highly differentiated products facing different demand curves.

Similarly, it is possible that Airbnb guests prefer residential neighborhoods to the downtown areas where many hotels are located. It is unclear how much such guests would value a room in a hotel that successfully petitioned the city for an exception to zoning rules and was located in the same neighborhood as an Airbnb.

II. Structural Factors That Make Taxing Airbnb Challenging

Despite the numerous problems posed by regulatory arbitrage, Airbnb and similar platforms have proven remarkably difficult for cities to tax and regulate. Some of this is an old story of innovation running ahead of regulatory capacity. But there are also structural features of platforms that pose truly novel regulatory challenges. In this section, I identify inter-related economic, legal, and political characteristics of Airbnb that make tax and regulatory enforcement difficult. While identified in the context of a digital rental platform, the concerns pertain broadly to most other platform firms.

A. Economic

There are several features of Airbnb's business model that present distinct challenges, particularly for regulators accustomed to the traditional hotel industry.

Points of collection and economies of enforcement. A key finding in the public finance literature is that there is less tax evasion the higher up the supply chain collection occurs.[9] The mechanisms driving this phenomenon are applicable to Airbnb. First, because enforcement resources are scarce, they can be used far more efficiently to collect tax revenues from a few large firms than many small ones. Second, larger firms are more likely to create a paper trail for transactions than smaller firms, easing the task of the tax collector. Finally, larger firms are typically more risk averse about outright evasion than smaller firms, usually because they have more to lose.

Because the hotel tax is levied at the host level, prior to VCAs, cities had to rely on thousands of individual hosts being both aware of, and willing to fulfill, their obligation to collect hotel taxes. This represented exponentially more points of collection for hotel taxes than cities were used to and made cost effective auditing

9 Kopczuk et al. 2016.

impossible. For example, in Chicago's central loop district, there are approximately 140 registered hotels but more than two thousand Airbnb listings. Though Airbnb's position was that hosts were supposed to "factor in local taxes" in setting their initial price and remit out of their "share" of the transaction, very few hosts did. It did not help that city collection systems were designed for large hotel accountants, rather than small businesses. For example, Chicago had no digital portal for paying hotel taxes—hosts were expected to fill out a five-page form and send a hard copy, along with a check, to the appropriate city agency.

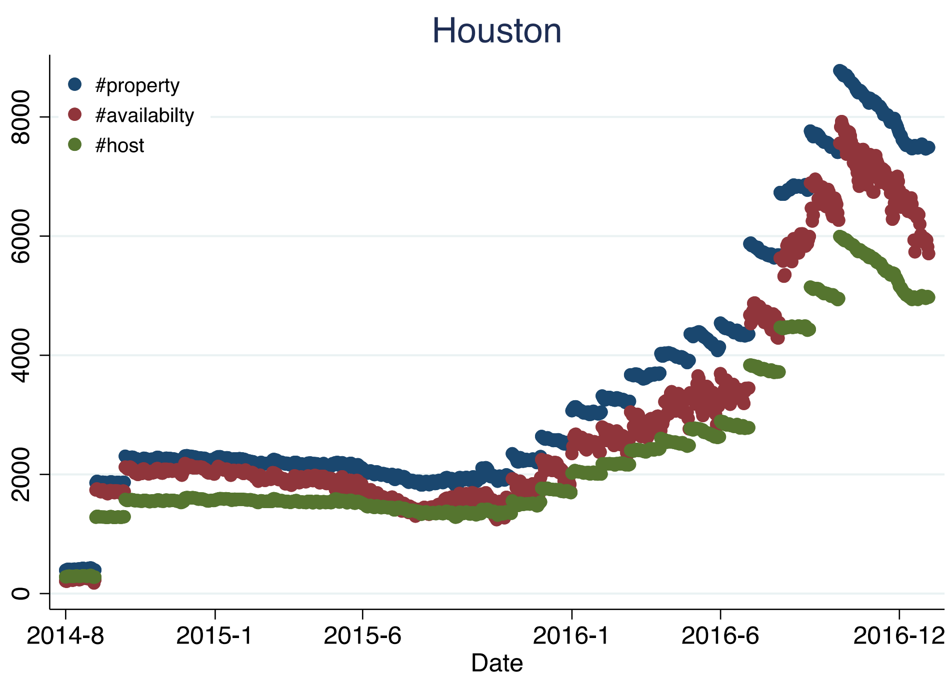
Some cities experimented with host registration systems, but without access to host contact information, it was challenging to communicate this to hosts, much less assess how many hosts complied with registration. I discuss these initiatives in further detail in Section VI, *infra*.

Limited physical capital requirements. Another difference between Airbnb and traditional hotels concerns the upfront capital required for operation. Hotels require large capital investments in the construction of new property or the renovation of an existing space, and require city permits at almost every stage. Even without permitting, property construction is almost by definition highly visible: standing up a new hotel in the center of a city is a multi-year process that would be almost impossible to hide.

In contrast, Airbnb leverages the existing capital (i.e., properties) of individual owners. The conversion of an individual owner-occupied unit into a full-time, short-term rental takes days or months, not years. In addition, this process largely occurs without the public indicators that accompany hotel construction. Because the barriers to adding new property listings to Airbnb are so low, it can also be difficult for regulators to accurately estimate the size or growth of the market in real time. In effect, Airbnb's business model allowed for a "ask forgiveness" model in what had always been an "ask permission" industry.

Exponential Growth. A related but distinct feature of Airbnb relative to traditional hotels is the nearly exponential growth rate in Airbnb listings that occurred in a relatively short period of time (Figure 4.1). This phenomenon meant that many cities, accustomed to several years of slow Airbnb growth upon its arrival, were blindsided when the platform's popularity exploded, leaving them little time to respond.

Figure 4.1 Airbnb listings in Houston, 2014-2016



Low barriers to entry for platforms and hosts. The last key economic feature of Airbnb and similar platform firms concerns their creation. Platforms themselves are relatively easy to stand up; they do not require a large physical capital investment, as a traditional hotel does. The start-up cost of a new platform is the creation of a website and payment system. As a result of these relatively low entry costs, if one platform is regulated or taxed, then a nearly identical one could quickly enter and take its place, leading to a regulatory game of 'whack-a-mole.' A side-by-side comparison of the Airbnb and VRBO interfaces suggests this inherent substitutability.[10] Similarly, host profiles can be

10 Note that the counterargument to this assertion is the importance of network effects—if all customers want to book on Airbnb, demand for that specific platform may be sticky. While acknowledging this, it seems that in the long run, consumers will likely respond to substantial price differences. Further, the real effect of platform substitutability may be in the inhibition of regulators, who are reluctant to invest in regulating a single firm when another could take its place.

recreated on a new platform in minutes, and many hosts already list on multiple platforms.

B. LEGAL

Airbnb used the novelty of its business model vis-à-vis existing hotel regulation to its advantage. In addition to the inherent difficulty of regulating thousands of new rental spaces without location rentals in a short amount of time, cities also faced significant legal barriers. Airbnb used the novelty of its business model vis-à-vis existing hotel regulation to its advantage, first in disputing the applicability of STR regulations and then by aggressively pushing back on various attempts by local government to limit or exercise control over listings. This later strategy bore much in common with Amazon's scorched earth legal battles over state sales taxation authority pre-Wayfair.

Characterization of Transactions. First, Airbnb took the position that its' hosts were not subject to hotel tax under existing city regulations because host-guest transactions were "not commercial" in nature.[11] This position had almost no basis in existing regulations, and quickly became politically untenable as Airbnb market share dramatically increased.

Legal Uncertainty over City Regulatory Powers. The real legal issue quickly became to what extent Airbnb could be compelled to assist cities in collecting taxes or enforcing regulation. While New York was successful in obtaining basic retrospective listing data in Airbnb, Inc. v. Schneiderman,[12] cities struggled to obtain useable information (e.g. by maintaining a database of hosts, listings, and bookings that the city could access in real time). And even when local governments prevailed in court, the litigation process could span years. In New York, Airbnb sued to block a city ordinance requiring it to turn over more detailed information on listings in 2019—the law will not take effect until mid 2024.[13]

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11 CEO Chesky blog "Would you tax your former roommate like a hotel?"

12 989 N.Y.S.2d 786 (2014). The court ruled that the attorney general was allowed to subpoena Airbnb to investigate taxes paid by hosts. It also appears to be a pretty low standard; the AG just needs to show that the request has a "reasonable relation" to the subject matter.

13 Alexander Lycoyannis, *NY Court: Short-Term Rental Services Must Register Dwellings to Comply with Local Law* (Aug. 17, 2023), https://www.hklaw.com/en/insights/publications/2023/08/ny-court-short-term-rental-services-must.

Cities were even less successful in persuading courts that Airbnb should be required to directly collect taxes on behalf of hosts at the point of transaction. In Gannon v. Airbnb, Inc.,[14] a judge found that an attempt by Florida to make Airbnb (and other platforms) directly collect taxes was impermissible because "companies were not in the business of renting, leasing, or letting transient accommodations," and were therefore not responsible for collecting the hotel tax.[15]

These efforts were taking place in parallel with litigation on when *state* governments have the authority to compel sales tax collection from out of state online retailers. While the Supreme Court eventually affirmed state powers to tax online purchases (Wayfair vs. South Dakota), extending the same logic to city hotel tax enforcement has been rebuffed by multiple courts. While appearing inconsistent on the surface, Airbnb has successfully argued that cities are so varied in their regulations on STR, it would be ludicrous to require a corporation to separately remit to thousands of municipalities (i.e. complying with fifty state sales tax regulations is a reasonable burden to place on retailers). [Expand on issue of non-uniformity].

Airbnb also fought to override or pre-empt municipal STR restrictions by petitioning state legislators to intervene. For example, both Austin and Nashville attempted to pass legislation regulating short-term rental properties. In both cases, Airbnb waged aggressive, well-funded lobbying campaigns and successfully persuaded state lawmakers in Texas and Tennessee to pass legislation heavily restricting local governments' powers to regulate short-term rentals.[16]

IV. DID AIRBNB VCAS WORK?

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14 295 So.3d 779 (2020).

15 There is also a discussion of whether Airbnb could be considered a "dealer," which the judge also answered in the negative. A few months later, Florida state passed a Marketplace Facilitator Law that expressly excluded property rentals from liability.

16 Phil Williams, *REVEALED: Airbnb Legislation Shows How Capitol Hill Culture Affects Tennessee Communities* (Jan. 10, 2024, 11:16 AM), https://www.newschannel5.com/news/newschannel-5-investigates/revealed-airbnb-legislation-shows-how-capitol-hill-culture-affects-tennessee-communities; Mariana Alfaro, *Texas Proposal Would Keep Cities From Restricting Short-term Home Rentals* (Feb. 27, 2017, 12:00 AM), https://www.texastribune.org/2017/02/25/bill-would-overrule-local-legislation-over-short-term-rentals/.

Armed with the context of VCA adoptions and their characterization as an imperfect but arguably necessary last resort by frustrated and ossified city regulators, the next logical question is to ask if they achieved their intended objective—did they actually increase city hotel tax revenues?

A. Measuring Policy Effects Using Difference and Differences

In this section, I evaluate the effects of the policy on a city's hotel market and hotel tax receipts, using monthly data from STR, a market research firm, and tax collection data obtained from municipal governments via Freedom of Information Act requests. By re-assigning the duty to remit hotel taxes from hosts to Airbnb, and therefore making it more difficult for hosts to evade the tax, the policy could be expected to have at least two effects on a city's hotel market and its hotel tax receipts. First, it effectively increases the price of Airbnb listings, and may therefore increase demand for hotel rooms to the degree that those are seen as substitutes for short-term rentals. Second, even if demand for Airbnb rentals declines somewhat following the policy, it will likely increase a city's hotel tax receipts as the opportunities for evasion dwindle.

Using monthly hotel market and hotel tax receipt data from 2010 through October 2016 for eight cities that enacted these policies and three that did not,[17] I estimate the following difference-in-differences specification:

$$y_{mt} = \gamma_m + \gamma_t + \pi Treat_m POST_{mt} + \varepsilon_{mt} \tag{1}$$

where y_{mt} is the outcome of interest for municipality m in month t. Characteristics invariant to municipality or time period are captured by municipality and time fixed effects, respectively. The coefficient of interest, π, captures the difference in the outcome between municipalities that adopted the policy and those that did not, both before and after its enactment.

17 Complete hotel market data (from STR) and hotel tax receipt data (from FOIA requests) were assembled for eight cities that enacted the policy (San Diego, Palo Alto, Phoenix, Philadelphia, Santa Clara, DC, Chicago, San Francisco) and three that did not (Houston, Austin, Dallas).

B. RESULTS

Tax Revenues. Table 5.1 reports results from equation (1) for log hotel tax receipts. Enactment of the policy increased hotel tax receipts by an average of 10 percent. Taken together, these estimates suggest that enactment of the policy bolstered cities' hotel tax collection efforts, as evidenced by the increase in their tax receipts, and the lack of conclusive evidence that it raised traditional hotel contributions.

Table 5.1. Effects of VCAs on City Tax Revenues

	Diff-in-Diff	Event Study
	(1)	(2)
Treat * Post* Airbnb Market Ratio	2.656*	
	(1.09)	
Pre Month 4		-0.973
		(2.32)
Pre Month 3		-2.328
		(2.53)
Pre Month 2		-1.769
		(2.59)
Post Month 0		0.599
		(3.19)
Post Month 1		-0.498
		(3.11)
Post Month 2		0.736
		(3.18)
Post Month 3		0.244
		(3.35)
Post Month 5		0.240
		(3.43)
Post Month 6		0.892
		(3.06)
Post Month 7		2.770
		(3.33)
Post Month 8		1.463
		(3.27)
Post Month 9		1.810
		(3.39)
Post Month 10		1.717
		(3.36)
Post Month 11		2.090
		(3.65)
Post Month 12		3.951
		(3.58)
Post Month>12		8.946***
		(2.40)
N	659	659

Notes. Dependent variable is log of city's monthly hotel tax revenues. Treatment is defined as the interaction between Ever Treated City*Post* Relative Airbnb Market Size at the time of treatment. Col. 1 reports difference and difference estimates, Col (2) reports event study estimates for the equivalent

Platform Jumping. The long-term viability of revenue collections may be impacted if a large enough share of hosts switch to an alternative platform that is not subject to a VCA. VRBO, Airbnb's main competitor, is one such alternative (untaxed) platform. Platform jumping might be more prevalent between VRBO and Airbnb because the interfaces and requirements for the two sites are virtually identical. While creating an account for the first time on any platform takes a modest amount of effort (Airbnb advertises that it takes less than an hour), the marginal cost of creating an additional listing profile on a similar platform is likely even lower.

I test for a decline in Airbnb entries and reservations (and a corresponding increase in VRBO entrants and bookings) using a very similar approach to that used for testing the effect of hotel tax revenues explain above.[18]

Results are reported in Table 5.2. I find that Airbnb entry and reservations significantly decreased, while at the same point VRBO entry increased above entry prior to Airbnb's VCA. While Airbnb hosts may be dropping out of the market and not relisting on VRBO, I consider this suggestive evidence that platform jumping in response to taxation is cause for concern.

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18 Specifically, I estimate a difference-in-differences equation separately for each platform**:**

$$y_{mt} = \gamma_m + \gamma_t + \pi POST_{mt} + \varepsilon_{mt} \tag{2}$$

where the dependent variable measures entrants/bookings in metro m in month t. $POST_{mt}$ is equal to one in treated metros after the VCA implementation date. The identifying assumption is that parallel trends in entry exist between treated and untreated metros prior to implementation of the policy.

Table 5.2. Effect of VCA on Airbnb Exits, VRBO Entries

	Airbnb Entry	Airbnb Entry (logs)
	(1)	**(2)**
Platform* Treat* Post	-120.743	-1.743
	(55..68)	(1.68)
N	1647	1647

Notes. Col.1 reports average effect of the policy on Airbnb hosts (absolute measure). Col. 2 reports the effect of airbnb entry in logs. Both specifications estimated with seasonal effects. Treatment is defined as the interaction between Platform*Ever Treated City*Post. Platform is equal to 1 if Platform is Airbnb. Standard errors are reported under coefficients.

V. Buyer's Remorse

Despite anecdotal and quantitative evidence (discussed in Section V) that Airbnb VCAs were effective in their primary objective of collecting taxes, some cities with VCAs are now seeking to nullify or withdraw from them in favor of more restrictive legislation. In this section, I argue that many, though not all, of the ongoing problems and disillusionment with VCAs stem from provisions limiting cities' access to individual host information.

A. Difficulty of Auditing Transactions

Despite their wide adoption, and preliminary evidence that they are effective at increasing revenue collections, some cities are reconsidering their VCS. For example, San Diego City Council is attempting to pass ordinances that would override its VCA,[19] citing stonewalling by Airbnb in response to questions about irregularities in remittances.

19 Paris Martineau, *Inside Airbnb's 'Guerrilla War' Against Local Governments, Wired* (March 20, 2019, 7:00 AM), https://www.wired.com/story/inside-airbnbs-guerrilla-war-against-local-governments/.

B. FAILURE TO ADDRESS QUALITY OF LIFE CONCERNS: CONSEQUENCES OF FORFEITING DATA ACCESS

Although it is problematic to verify whether Airbnb is remitting all taxes to the city without individual transaction data, by far the most significant consequence of cities' forfeiture of host identifying and transaction data is the inability to enforce various *non-tax* regulations.

For example, New Orleans, despite being viewed as the "poster child" of the VCA effort in 2016,[20] claims that Airbnb reneged on a key part of their agreement, intended to set up a host registration system. After years of back and forth, the city claims that Airbnb failed to hand over any of the necessary data (including, for example, address or account owner name or contact information). New Orleans apparently abandoned the effort, passing one of the most restrictive regulations in the country that limit licenses to rent to one property per block and a requirement that the licensee live on the property.[21] Whether they can enforce these regulations without a registry is uncertain.

Lack of a functional registry also prevents local tax authorities from recouping taxes owed on previous transactions from hosts directly, and prevents them from monitoring their behavior on other platforms, including direct competitors to Airbnb, that have not signed VCAs. Put differently, VCAs can make local governments permanently dependent on the individual firm for significant revenues, and are signed when those firms have accrued sufficient market power to negotiate them on their terms.

VII. THE PROMISE AND THE PERIL OF VCAS

In the previous section, I argued that VCAs that leave cities without access to individual level transaction data are a flawed tool for tax collection. However, there are circumstances in which a VCA, despite its limitations, is still the best weapon in the government's arsenal. In this section, I discuss factors that cities

20 Katie Benner, *New Orleans Becomes New Model for Airbnb to Work With Cities* (Oct. 7, 2016), https://www.nytimes.com/2016/12/07/technology/new-orleans-airbnb-model.html.

21 Kevin McGill, *New Orleans Attempts Again to Regulate Vacation Rentals* (March 24, 2023, 6:11 PM), https://apnews.com/article/new-orleans-short-term-rental-regulations-a53e5f391ed86cd475d4fe3b9f6f06e9.

should consider in determining whether to pursue a VCA with a platform firm and what proactive steps policy makers might take to improve leverage to secure more favorable terms than those common to Airbnb VCAs. Finally, I situate the lessons from Airbnb VCAs and the role of VCAs generally in the broader policy debate about the limits of information reporting without remittance.

A. WHEN IS A VCA STILL THE BEST (BAD) OPTION?

Cities must weigh the short-term revenue benefits against the long-term costs of a VCA. A VCA may still be the best policy option if some or all of the following conditions are met: (1) tourism sector is small and primary concern is revenue rather than residential welfare; (2) if institutions for tax collection are weak or generally over-stretched; (3) there is political disagreement between city and state about STR regulation; (4) there is a single dominant platform (i.e. little risk of market fracture that necessitate signing many agreements).

B. LEVERAGE

As cities look to the future and the likelihood of further innovation/disruption in traditional industries, it may be advantageous to try to increase their relative bargaining power to avoid VCAs which preclude non-tax regulations by one or several of the following actions: (1) bargaining collectively—if several large cities agreed to negotiate with Airbnb together, it is likely better terms could be extracted; (2) cooperative monitoring—institutionalized sharing of concerns between cities might allow earlier identification of platforms that may exist in regulatory gray space, before these platforms accrue political power; (3) standardized data sharing and greater uniformity and (4) delegate negotiating to state governments who agree with the need for regulation.