Sharing economy and incumbents' pricing strategy: The impact of Airbnb on the hospitality industry

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Highlights (for review)

- We study how sharing economy (SE) influences incumbents' price responses.
- We study how these incumbents' price responses depend on the type of incumbents.
- We address these questions in the hospitality industry.
- Low/medium-end hotels set lower prices where SE is stronger only for weekend offer.
- High-end hotels set higher prices where SE is stronger.

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Abstract

In this paper, we examine how the emergence of sharing economy platforms influences incumbents' price responses. Grounding on the literature on price reactions to new entrants and on the unique characteristics of the sharing economy, we argue that the effect of the penetration of the sharing economy on incumbents' prices is not straightforward, and actually depends on the type of incumbents as well as certain product/service offer characteristics. Indeed, relying on a large sample of hotel price offerings from the Italian market, we find that the effect of the growing relevance of the sharing economy (exemplified by Airbnb) on incumbents' prices depends on the type of incumbents (low/medium-end versus high-end hotels) as well as on the accommodation period (weekend versus weekdays), and thus on the type of consumers looking for accommodation. Specifically, low/medium-end incumbents set lower prices in geographical areas where sharing economy has a higher penetration, but this occurs only for weekend accommodation search. In contrast, high-end incumbents tend to set higher prices in geographical areas where sharing economy has a higher penetration, irrespective of the accommodation period. We discuss the important implications of our findings for incumbents, sharing economy platforms, consumers, and policy makers.

Keywords: Sharing Economy, Pricing Strategy, Revenue Management, Hospitality Industry.

1. Introduction

The recent surge of peer-to-peer platforms has enabled people to collaboratively share and make use of underutilized resources on a massive scale upon payment, giving rise to a new phenomenon commonly referred to as *sharing economy* (Sundararajan, 2016; Zervas et al., 2017; Jiang and Tian et al., 2018; Tian and Jiang, 2018). This implies that under sharing economy each consumer can become a product/service provider by exploiting the ownership of certain underutilized resources. Important examples of platforms enabling the sharing economy include Airbnb and Couchsurf in the hospitality industry, Uber, Lyft, Blablacar in the car transportation industry, Mobypark in the parking sector, Borrow my doggy in the domestic animals' market, Lufax in the financial sector (Jiang and Tian, 2018). By activating product/service provision from underutilized resources owned by a plethora of geographically distributed individuals, sharing economy platforms have emerged as an alternative channel to access goods and services traditionally provided by long-established industries, such as car transportation service, hospitality, etc., (Sundararajan, 2016). In fact, this unique and novel characteristic of exploiting underutilized resources owned by a large multitude of geographically distributed individuals translates into very competitive prices offered in sharing economy platforms, thus making them extremely insidious threats to cope with for traditional incumbents operating in these industries (Zervas et al., 2017). The reason is twofold. First, the underutilized capacity relates to resources generally purchased by individuals for other scopes (e.g., private usage/consumption), thus implying that the related costs (e.g., costs such as property taxes, mortgage, maintenance, cleaning, etc., for hospitality providers on Airbnb) are almost entirely covered within those scopes and, at any time, any excess of this capacity can be made available by these individuals on sharing economy platforms with near-zero additional costs to the simple purpose of generating extra-income (Benkler, 2004; Zervas et al., 2017; Blal et al., 2018). Second, the sharing economy reduces barriers to entry as any resource owner can supply his/her resource by simply leveraging on platform services. In turn, very low entry barriers attract a plethora of geographically distributed resource-owners, thus naturally including also providers with very low opportunity cost (i.e., individuals accepting very low extra-income for their shareable resources), which further pushes prices downward. In contrast, incumbents of traditional businesses (e.g., hotels) cannot leverage on such a huge and geographically distributed underutilized resources, and, more importantly, their resources have been acquired for the specific business scope. Therefore, when pricing their product/services they have to take into account all costs involved in the business operations to ensure adequate profitability and maximize the returns of their investments (Einav et al., 2016). This different feature of the sharing economy is likely to impact especially on industries facing high variability in customers' demand, as the newcomers can scale to meet demand more dynamically, given it is easier to adapt the supply when relying on a multitude of small underutilized and geographically distributed resources (Blal et al., 2018).

In particular, the hospitality industry offers all the characteristics required to make peer-to-peer platforms successful, and thus a real threat for the business of traditional firms (e.g., hotels). Indeed, the resources (houses/rooms/beds) are largely available in many geographical areas and, in light of the above arguments, the cost (and thus the minimum affordable price) to offer them in the market is, in general, lower than that of incumbents. Moreover, the financial crisis has increased taxation on properties, unemployment and wealth erosion, which, on the one hand, have jointly induced resource owners (e.g., landlords) to look for additional economic returns from their properties, and, on the other hand, travelers to look for less expensive accommodation solutions. Finally, the transactions between resource providers and travelers can easily be managed online due to the rise of digital peer-to-peer platforms (Constantinides et al., 2018; Rolland et al., 2018), mimicking already consolidated online travel agents (e.g., Booking.com or Priceline.com).

While the issue of incumbents' reactions to new entries, especially those related to pricing, has been largely studied across many industries in the extant economics and management literature (Bain, 1951; Bresnahan and Reiss, 1991; Frank and Salkever, 1997; Thomas, 1999; Yamawaki, 2002; Ward et al., 2002; Simon, 2005; Goolsbee and Syverson, 2008; Prince and Simon, 2015), the novelty of the sharing economy players highlighted above makes them totally different from traditional new entrants (e.g., a new hotel company entering in the hospitality industry or a new taxi company entering in the car transportation service industry). Indeed, taking advantage of underutilized small resources owned by a multitude of geographically distributed individuals, sharing economy platforms enable the provision of a huge variety of product and/or service solutions differing in terms of hard and soft characteristics as price, geographic location, quality and ability to match a large customers' needs combination (Wang and Niculau, 2017; Zervas et al., 2017). As a result, the entrance of a sharing economy player is likely to generate a much more disruptive effect on incumbents than traditional new entrants would be able to do (Bower and Christensen, 1995), due to the fact that the latter can hardly count on the same massive capacity offered, the same capillary diffusion, the same offer variety and the same competitive prices enabled by the former. In turn, the greater competitive threat entailed by the growth of sharing economy players should in principle generate neater and more articulated strategic pricing responses of incumbents, which is important to unravel in order to advance theoretical understanding on the competitive strategic interactions determined by new unconventional and disruptive economy models as well as to support pricing decisions of different parties (incumbents, sharing economy players, consumers) facing the sharing economy wave.

Therefore, in this paper, we aim to contribute to the literature on incumbents' pricing reactions to new entries as well as to the nascent literature on the sharing economy by examining how the presence of sharing economy players influences incumbents' price responses and how these price responses depend on the type of incumbents as well as certain product/service offer characteristics. We address these important research questions in the context of the hospitality industry because pricing is one of the most important competitive weapons in this industry, given its intrinsic characteristics. Moreover, there is broad consensus on the fact that the hospitality industry can be considered as exemplificative of the disruptive effect of the sharing economy (Blal et al., 2018).

Specifically, given the absolute prominence of Airbnb as a sharing economy player in this industry, we examine how hotels' pricing strategy is influenced by the growing penetration of Airbnb. We advance that the manner in which the competitive threat exerted by this sharing economy player affects incumbents' pricing decisions is definitely not straightforward. Indeed, relying on data related to Airbnb as well as on a large sample of hotel price offerings (more than 35,000 price offerings from around 2,000 hotels) retrieved from the popular hotel booking platform Booking.com in the Italian market, we argue and find that incumbents' price reactions are not uniform. Rather, they vary according to the type of incumbent, the targeted market as well as some offer characteristics. Specifically, in line with classical literature on new entries (e.g., Thomas, 1999; Goolsbee and Syverson, 2008) as well as some initial studies on sharing economy (Hajibaba and Dolnicar, 2017; Zervas et al., 2017), hotels targeting low/medium consumer segments (i.e., 1-3 star hotels) tend to set lower prices in cities where sharing economy (i.e., Airbnb) has a higher penetration and thus represents a more relevant threat, as compared with cities where sharing economy (i.e., Airbnb) has lower penetration. However, in this case we add the novel evidence that this price-lowering effect occurs only for specific types of service offers, i.e., those related to weekend accommodation rather than those related to working days accommodation. This is because, by enabling very competitive prices, sharing economy players in the hospitality industry have emerged as an appealing alternative especially for price-sensitive consumers. Therefore, they tend to be competitors especially for consumers traveling for vacation purposes (leisure travelers), rather than for consumers who travel due to job/business reasons (business travelers) and thus are usually less price-sensitive. More interestingly, we argue and find a positive effect of sharing economy (Airbnb) penetration on prices of hotels serving high-end consumers (i.e., 4-5 star category hotels). That is, these hotels tend to set higher prices in cities where sharing economy attracts more demand and thus represents a more relevant threat to incumbents, and they do it irrespective of the type of service offer (weekend or weekdays accommodation). This apparently counter-intuitive result suggests that the high-end hotels prefer setting higher prices in geographical areas where there is a larger penetration of sharing economy. This is because the greater downward pressure on prices coming from Airbnb implies that high-end hotels should reduce the price of their best deals to the extent that it would be an inconsistent strategy with their higher service quality and thus would be negatively perceived by their core segment (i.e., high-end consumers). Therefore, high-end hotels tend to tilt away from any possible competition with a dangerous and unconventional competitor for more price-conscious consumers, and concentrate more on their core segment. As a consequence, they will try to signal more their higher service quality by limiting the practice of offering best deals (e.g., applying a lower discount on the standard rate or using it less frequently) in areas where Airbnb's penetration is stronger, thus resulting in higher prices in these areas. Overall, our findings suggest that the sharing economy has an impact on the pricing decisions of both types of incumbents, but in a different manner.

The remainder of the paper unfolds as follows. In Section 2 we provide the background of the sharing economy in the hospitality industry. In Section 3 we develop our theoretical arguments and formulate our hypotheses grounding on the relevant literature on incumbents' pricing reactions to new entries, fine-tuned to the sharing economy context. In Section 4 we discuss data and variables employed in this study. In Section 5 we present and discuss our findings and a robustness check. Finally, in Section 6 we conclude providing important implications and tracing avenues for future research.

2. The background of the sharing economy in the hospitality industry

The hospitality industry is recognized by many sources as the industry where the sharing economy is having the biggest impact, with Airbnb being by far the major sharing economy player in this industry (Blal et al., 2018; Guttentag, 2015; Guttentag and Smith, 2017). In particular, this peer-to-peer platform, founded less than 10 years ago, allows people across the globe to lease or rent short-term lodging and provide travel experiences, especially for consumers who travel for vacation purposes (Fang et al., 2016).

However, initially, the entry of Airbnb and similar platforms has been downplayed by incumbents in the hospitality industry, with major hotel chains claiming that Airbnb would not threaten their business as they target different segments (Tsang, 2017). In the meanwhile, Airbnb has experienced very rapid growth reaching, in less than ten years, more than 150 million users in 191 countries and in more than 65,000 cities, and a current valuation ($31 billions) higher than established hotel chains such as Hyatt, and comparable to market capitalization of giant companies such as Marriott and Hilton (Tsang, 2017). Moreover, a recent report shows that Airbnb currently owns around 9% of the market share in terms of supply, i.e., homes/apartments/rooms made available by geographically distributed owners on Airbnb platform, (Haywood et al., 2017). Because of the discussed intrinsic characteristic of the sharing economy, the capillary and relatively cheap supply capacity enabled by Airbnb may create a substantial threat to the hospitality industry (Haywood et al., 2017). As a matter of fact, although Airbnb has often argued that their business brings new visitors to destinations and that 70% of their listings are outside of hotel districts, a report by Morgan Stanley indicates that about 42% and 36% of Airbnb guests switched from hotels and bed & breakfasts, respectively (Business Insider, 2017). Guttentag and Smith (2017) provide evidence that even nearly two thirds of guests use Airbnb as hotel substitute. As a result, the hospitality industry has started considering Airbnb as a serious competitor to cope with. For instance, the American Hotel and Lodging Association has set up a plan to induce more stringent regulation on the business of Airbnb (Tsang, 2017).

Airbnb may indeed impact hotels in at least two ways. First, for existing hotels, it may curtail the growth of average daily rates (ADRs). Indeed, the sharing economy nature of Airbnb supply suggests that historic price premiums realized especially during peak demand periods are likely to be eroded (Griswold, 2016). Second, it may negatively influence new hotel property development. That is, Airbnb may become an impediment to traditional hotel construction and reduce traditional hotel supply growth in many markets. In either case, the rapid growth of Airbnb represents a clear danger for incumbents' profitability in both short and long terms. As a matter of fact, most of the initial empirical studies provide support to this view (Hajibaba and Dolnicar, 2017; Zervas et al., 2017; Blal et al., 2018). In contrast, there are some studies suggesting that the explosive growth for Airbnb has not damaged the hotel industry as it has only brought additional travelers to the market or customers who would otherwise have chosen alternate accommodations, such as the couch of a friend or family member (Dogru et al., 2017). We advance the current understanding of the impact of the sharing economy on the hospitality industry by elucidating whether and how incumbents articulate their price decisions to respond to the unconventional and disruptive threat coming from Airbnb, based on important product and market characteristics.

3. Theory and hypotheses

3.1. Theory on incumbents' pricing reactions to new entries

A large body of literature in economics and management has traditionally investigated how incumbents react to entry threats and actual entries into a market, with considerable emphasis on pricing decisions. As intuition may suggest, most of these studies have demonstrated that prices generally fall in the face of increased competition due to new entries (Bain, 1951; Bresnahan and Reiss, 1991; Goolsbee and Syverson, 2008; Prince and Simon, 2015; Thomas, 1999; Yamawaki, 2002; Windle and Dresner, 1999). In some cases, the documented price reduction can be due to cut on service or product quality (Prince and Simon, 2015). This is possible since, in some settings, customers are more responsive to price changes than to changes in service or product quality. For example, in the airline industry, many websites allow travelers to compare ticket prices across airlines, whereas information on on-time performance data is more difficult to retrieve, thus making easier to reduce quality in order to cut costs, and thus be able to offer lower prices (Prince and Simon, 2015). In contrast, other studies have demonstrated that incumbents do not cut prices after entry (Thomas, 1999), and actually their pricing responses may vary within the same industry (Frank and Salkever, 1997; Yamawaki, 2002; Simon, 2005; McCann and Vroom, 2010). For example, Yamawaki (2002) has found that, following the entrance of Lexus in the US market, German car manufacturers lowered prices, whereas US car manufacturers raised them. Frank and Salkever (1997) have found that branded drugs' prices tend to increase after entry, while prices decrease for generic drugs. Similarly, Ward et al. (2002) have shown that branded food companies raised their prices after private-label invaded the US market, extracting more surplus from loyal and less price-sensitive consumers, while leaving more price-sensitive consumers to buy private label products. This evidence is in line with recent theoretical predictions of the positive impact of increased competition on prices (Perloff et al., 2005; Chen and Riordan, 2008). In fact, in industries with differentiated products, firms can leverage on a variety of tools for responding to new entries (Simon, 2005). It has been documented that in some cases incumbents differentiate away from the new entrant (Semadeni, 2006; Prince and Simon, 2015), whereas in other cases they result in closer positioning to the new entrant (Thomas and Wiegelt, 2000). In this regard, some works have attempted to discern conditions under which an incumbent maintains its distance from or stay close to the new entrant (de Figueiredo and Silverman, 2007; Wang and Shaver, 2014). For example, de Figueiredo and Silverman (2007) have suggested that incumbent fringe firms move away from a new entrant dominant firm lowering their prices, but, at the same time, new entrant fringe firms move close to the new entrant dominant firm. Similarly, Wang and Shaver (2014) have shown that weaker incumbents move away from a new entrant to a greater extent than stronger incumbents. More broadly speaking, size and dominant position (Gaskins, 1971), cost (Milgrom and Roberts, 1982), production capacity (Spence, 1977; Dixit, 1980), advertising and product differentiation (Schmalensee, 1982; Fudenberg and Tirole, 1984), quality (McCann and Vroom, 2010), and product variety (Ren et al., 2011) have been all highlighted as important factors that can influence the type of incumbent's pricing response to new entry.

While the above literature has documented a variety of incumbents' pricing reactions to new entries across different industries, the new entrants considered in this literature usually display similar characteristics to the incumbents (e.g., a new car manufacturer in the car industry) in the sense that they utilize similar business models and/or share similar cost structure. However, as explained in greater detail in the next section, sharing economy players, as new entrants, display a very unique characteristic that significantly distinguishes them from traditional new entrants and thus may give rise to neater and more articulated incumbents' pricing responses. Therefore, we contribute to the extant knowledge on incumbents' pricing reactions by studying these incumbents' reactions when the competitive threats derive from the sharing economy.

3.2. Theory on incumbents' pricing reactions to sharing economy entry

The nascent literature on the sharing economy has identified an important characteristic of sharing economy players, which neatly distinguishes them from incumbents in traditional industries and thus may significantly influence the competition between the two types of actors (Cusumano, 2015; Sundararajan, 2016). As mentioned earlier, indeed, sharing economy firms are platforms that match supply and demand relying on underutilized resources, which are not owned by them, but are geographically distributed among a multitude of resource owners, e.g., landlords, car owners, tools owners (Sundararajan, 2016; Zervas et al., 2017; Jiang and Tian, 2018). In particular, it has been suggested that sharing economy players facilitate a plethora of micro-suppliers (e.g., micro-enterprises and even single individuals and families) to bring their products to market, thus lowering the barriers to entry for these resource providers (Zervas et al., 2017). In contrast, firms operating in traditional industries usually rely on proprietary resources (e.g., new hotels have their own buildings and rooms, taxi companies have their own cars, hardware shops resell their purchased tools). This difference between sharing economy players and traditional players is crucial because, by relying on a multitude of geographically distributed resource owners who provide their small underutilized supply, the former can naturally offer larger variety of products/services and, more importantly, be more capillary in the market at much lower prices than the latter ones, thus potentially covering more heterogeneous needs in multiple geographic markets (Guttentag, 2015; Tussyadiah and Pesonen, 2015; Zervas et al., 2017). In addition, some studies have demonstrated that sharing economy firms can reduce price variability in the market by flexibly scaling supply to accommodate increased demand (Einav et al., 2016; Zervas et al., 2017). Overall, the lower prices for consumers make sharing economy platforms extremely attractive especially to price-conscious consumers (Mohlmann, 2015).

We explain that the lower prices implied by the sharing economy are due to two main reasons. First, underutilized resources can be offered by many individuals on sharing economy platforms with near-zero additional costs to the simple purpose of generating extra-income (Benkler, 2004; Zervas et al., 2017; Blal et al., 2018). Indeed, these underutilized resources are usually acquired for other scopes (e.g., private usage/consumption), which implies that the related costs (e.g., costs such as property taxes, mortgage, maintenance, cleaning, etc., for hospitality providers on Airbnb) are considered almost entirely covered when making pricing decisions. Second, the sharing economy reduces barriers to entry as any resource provider can supply his/her resources by simply leveraging on platform services. In turn, this opens the doors to a plethora of geographically distributed resource-owners, thus naturally including also providers accepting very low payments for their shareable resources, which further puts downward pressure on prices. In contrast, given that their resources have been acquired for the specific business purpose, incumbents of traditional businesses need to take into account all costs involved in the business operations, when pricing their product/services, to ensure adequate profitability and maximize the returns of their investments (Einav et al., 2016). This naturally leads to higher prices in traditional businesses.

We argue that the above unique characteristic of sharing economy players makes them potentially more dangerous than traditional new entrants for incumbents, to the extent that many have even suggested that sharing economy can revolutionize the capitalism, giving rise to powerful platforms and crowd-based economy able to put aside traditional players (Sundararajan, 2016). In support of these arguments, Zervas et al. (2017) have empirically shown that hotel revenues in Texas have decreased significantly due to the growth of Airbnb. Similarly, Blal et al. (2018) have found negative relationship between the growth of Airbnb and hotels' sales in San Francisco. Hajibaba and Dolnicar (2017) have found that low/medium-end accommodation providers are more in danger of being replaced by peer-to-peer accommodation alternatives as opposed to top-end hotels. Fang et al. (2016) have, instead, provided evidence that in Idaho the growth of Airbnb has reduced the number of employees in low-end hotels.

Grounding on some studies in the cited literature on pricing reactions to new entries (Frank and Salkever, 1997; Ward et al., 2002; Yamawaki, 2002; Perloff et al., 2005 Simon, 2005; Chen and Riordan, 2008; McCann and Vroom, 2010), we theorize that, in highly differentiated industries, the incumbents' pricing reactions to the growth of sharing economy players should be quite articulated in the sense that they should hinge upon the characteristics of the incumbents, the type of consumers they serve as well as some product/service offer features. As explained in greater detail in the next section, we address our arguments in the hospitality industry since, in this industry, price decisions are intrinsically important weapons for incumbents to react to the growing presence of the sharing economy, which on its side can leverage on lower prices to disrupt the business of traditional firms.

3.3. Hypotheses on incumbents' pricing reactions to sharing economy entry in the hospitality industry

The hospitality industry is generally characterized by high consumer segmentation and price discrimination, as well as by highly perishable products (e.g., rooms), which make hard to match short-term fixed supply and variable demand (Gallego and Van Ryzin, 1994; Koide and Ishii, 2005; Abrate et al., 2012; Chen et al., 2014; Georgiadis and Tang, 2014; Kim and Randhawa, 2017; Zervas et al., 2017). As such, this industry encompasses incumbents of different characteristics, which offer differentiated product/services at different price levels dynamically changing over time, and thus may respond to new entrants differently depending on the opportunities and threats they face upon a new entry (Caves and Porter, 1977; Yamawaki, 2002). In particular, on a general level, the type of consumers targeted by the incumbents and the characteristics of the product/service searched by consumers are two interconnected elements that may play a role in shaping the incumbents' price responses to new entries. Transferring these general elements to the specific context of the hospitality industry, we can indeed distinguish between incumbents (e.g., 4-5 star hotels) typically targeting highly valuable consumers who are willing to pay high prices for high-end, if not luxury, services, and incumbents (e.g., 1-3 star hotels) targeting more price-conscious consumers who do not look much for sophisticated ancillary services and simply need to satisfy their accommodation need.[1] Moreover, some consumers search hotel accommodation due to vacation purposes (e.g., leisure travelers), whereas other consumers in their accommodation search are driven by job- or business-related reasons (e.g., business travelers),

[1] We follow both literature and common practice in identifying and distinguishing 4-5 star hotels as high-end hotels, and 1-3 star hotels as low/medium-end hotels (Unterschulz et al., 1998; Torres, 2003; Baloglu and Pekcan, 2006; Tsang and Yip, 2009; Zervas et al., 2017).

and because the latter often do not pay directly for the service they tend to be less price sensitive than the former, everything else being equal. The existence of different segments and needs results in exacerbated product differentiation among incumbents based on their distinctive features (targeted segment, location, buildings, personnel, services, etc…). Even within each incumbent, product differentiation, consumer segmentation, and price discrimination will be practiced based on services specifically offered to match certain consumers' characteristics, e.g., room type, cancellation policies, etc., (Abrate et al., 2012; Chen et al., 2014; Roma et al., 2014).

The above considerations are particularly relevant to understand the alleged impact of the sharing economy on incumbents' price decisions. As discussed earlier, sharing economy players' key feature is their unique ability to rely on geographically distributed small resources, which are owned by a multitude of people for other scopes (e.g., private usage) and thus can be made available at lower prices for users than those offered by traditional incumbents. The fact that sharing economy platforms enable a multitude of heterogeneous resource providers to offer very competitive prices confers a strong competitive advantage of cost leadership and a capillary diffusion to these new entrants, which may threaten incumbents' profitability by attracting especially price-conscious consumers (Griswold, 2016; Zervas et al., 2017). In turn, this should provide incumbents with a strong incentive to maneuver their prices to respond to the growth of this player.

In general, we argue that the sharing economy has an impact on the pricing decisions of both low/medium-end and high-end hotels, but these incumbents respond differently by virtue of their different characteristics. Moreover, we also advance that even within the same type of incumbents, the response may change depending on the product/service offering and the type of accommodation search. Specifically, as sharing economy players (i.e., Airbnb) naturally tend to attract more price-conscious consumers due to their highlighted intrinsic characteristic (Haijbaba and Dolnicar, 2017; Zervas et al., 2017), they are direct competitors more for hotels targeting this type of consumers (typically, 1-3 star hotels), than for hotels targeting high-end segments. However, we also add that this direct competition really emerges depending on the service offer searched by consumers, and specifically on whether consumers look for accommodation stay for vacation or for business/job reasons. That is, this direct competition should be relevant only for price-conscious consumers who travel for vacation or other recreational purposes (i.e., price-conscious leisure travelers) because the business of sharing economy players in the hospitality industry such as Airbnb has been traditionally conceived for short-term vacation rentals, and as such has focused mostly on this type of consumers rather than on business travelers (Fang et al., 2016). Based on these arguments we advance that, as a result of the increased competition determined by sharing economy players, low/medium-end hotels (i.e., 1-3 star hotels) should naturally set lower average price (i.e., the average price across of all price offerings of the given hotel for a given accommodation search) and lower best deal (i.e., the minimum price of the given hotel for a given accommodation search) in a geographical areas (e.g., cities) where sharing economy's penetration is more intense, as compared with areas where this penetration is milder. That is, we expect a classical negative effect on a new entry on incumbents' prices (Goolsbee and Syverson, 2008). However, given that sharing economy players mostly focus on leisure travelers, this effect should be likely observed in periods of the week typically characterized by the presence of demand from this type of travelers (i.e., weekends), rather than in those periods characterized by the presence of demand from business travelers (working days). Therefore, for low/medium-end incumbents we formulate the following hypothesis:

H1: Low/medium-end incumbents (i.e., 1-3 star hotels) set lower average prices and best deals in geographical areas (i.e., cities) where sharing economy players' penetration is higher than in areas where sharing economy players' penetration is milder, ceteris paribus. However, these lower prices occur only for weekend accommodation searches, and not for weekdays accommodation searches.

Regarding hotels targeting high-end consumers, i.e., typically 4-5 star hotels, it is known that they occasionally offer low-price deals to attract demand from segments usually targeted by low/medium-end hotels (e.g., deal-seekers) in order to dispose possible excess capacity (O'Connor, 2003). In this case, high-end hotels end up profitably competing with low/medium-end hotels for more price-conscious consumers by offering basic services, but with the advantage that these consumers perceive high-end hotels as of higher quality. However, we contend that the growing presence of a new entrant adopting a 'sharing economy' business model (e.g., Airbnb), which favors extremely competitive prices, puts much stronger pressure on 4-5 star hotels to reduce the prices for occasionally attracting deal-seekers to clear up capacity, which, at the end, may not be a suitable strategy for these high-end hotels to follow. Indeed, competing against Airbnb for more price-conscious consumers would require 4-5 hotels to reduce prices significantly for their best deals, which in turn would be perceived as inconsistent with their higher service quality, thus distracting them too much from their core business, i.e., consumers who are willing to pay high prices for their more sophisticated services, with clearly negative consequences on profitability. As a result, we argue that they should have incentive to tilt away from any possible head-to-head price-based competition against this dangerous and unconventional competitor. Accordingly, they should signal their higher product/service quality by limiting the practice of offering best deals, for instance applying a lower discount on the standard rate or using it less frequently. In other words, the presence of an insidious and unconventional player should provide them with a greater incentive to concentrate on their core segment, extracting surplus from their target to a greater extent, while leaving more price-sensitive consumers to the sharing economy entrant and the lower-end incumbents (Frank and Salkever, 1997; Ward et al., 2002). Therefore, in line with some previous results available in the literature on pricing reactions to new entries (Frank and Salkever, 1997; Ward et al., 2002; Perloff et al., 2005; Chen and Riordan, 2008), we advance that in this case the effect of a higher sharing economy's penetration should be quite surprisingly opposite to that suggested for the case of low/medium-end hotels. That is, we should observe that, in geographical areas where sharing economy's penetration is stronger and thus represents a more insidious threat, high-end hotels (i.e., 4-5 star hotels) tend to set higher best deals and thus also higher average prices, as compared with areas where sharing economy's penetration is milder. Higher prices should therefore be interpreted as a clear intention to emphasize a different service positioning as compared with Airbnb and 1-3 star hotels to avoid being entangled into the increasingly fierce price competition for more price-conscious consumers determined by the entrance of Airbnb. Moreover, we argue that because marketing theory urges the price-quality positioning to be consistent (Kotler and Keller, 2012), this positive effect on prices should emerge irrespective of whether the hotel room reservation refers to a period of the week typically characterized by the presence of demand from leisure travelers (weekend) or to one characterized by the presence of demand from business travelers (weekdays). Combining all together, we formulate the following hypothesis on the effect of the sharing economy on high-end incumbents' pricing decisions:

H2: High-end incumbents (i.e., 4-5 star hotels) set higher best deals and average prices in geographical areas (i.e., cities) where sharing economy players' penetration is higher than in areas where sharing economy players' penetration is milder, ceteris paribus. Moreover, these higher prices occur irrespective of the period of the accommodation search (weekends or weekdays).

4. Data & Variables

To study how sharing economy affects hotel pricing decisions depending on the type of hotel (i.e., the star category) and the period of the accommodation search (weekend or working days), we considered two scenarios: 1) a couple of users looking for an accommodation in Italy during the first weekend of June 2018 (June 1st-June 3rd), which also includes the Italian Republic celebration (June 2nd); 2) a traveler in search of a two-nights accommodation in working days period, and specifically from June 4th (Monday) to June 6th (Wednesday), 2018, in an Italian city. In either case, we assume that the travelers plan the trip in advance and, specifically, intend to book their hotel rooms on March 2nd, 2018. Both types of travelers consider hotel offerings displayed on Booking.com, one of the most popular hotel website worldwide and by far the major hotel website in Italy (SiteMinder, 2018). We considered the same period of the year to travel (beginning of June) and the same booking period (beginning of March) for both scenarios to favor comparison of results. Moreover, considering booking period at the beginning of March, i.e., quite earlier in advance than the dates for which accommodation is needed, allows us to capture Airbnb's consumers in action given their tendency of being more price-conscious leisure consumers, as well as concentrate on the spatial effect of the sharing economy (i.e., its effect across different geographical areas), without being much influenced by shortage or excess capacity situations when approaching the accommodation dates.

The destinations considered for the above scenarios are drawn from the top 50 municipalities visited in Italy, i.e., those displaying the highest number of registered presences (in terms of booked nights) in Italian traditional accommodation facilities (specifically, hotels and other professional accommodation providers not enabled by the sharing economy), according to ISTAT (the Italian Institute of Statistics, www.istat.it). Because of the large number of municipalities and driven by the need of considering destinations suitable for both vacation and professional/business trips, we restricted to those having the status of city. It turns out that only 13 municipalities possess the status of city. Therefore, we considered the following 13 cities: Bologna, Florence, Genoa, Milan, Naples, Padua, Palermo, Pisa, Ravenna, Rome, Turin, Venice, and Verona. These cities well represent destinations suitable for both holidays and professional/business trips, as well as very different geographical areas in the Italian peninsula.

Table 1 reports some statistics regarding variables at the city level that we use in our regression models, namely the number of inhabitants (variable name *City Population*), the per-capita income in euros (*City Per-capita Income*), the estimated tourist flow (in terms of booked nights) in traditional accommodation facilities for the considered dates June 1-3 and June 4-6, respectively (*City Touristic Flow June 1-3* and *City Touristic Flow June 4-6*), the penetration of Airbnb in the given city regarding the specific dates (our variable of interest *City Airbnb Penetration*), the number of hotels available for booking at the moment of reservation on Booking.com in the given city for the specific dates (*Number of Available Hotels in the City June 1-3* and *Number of Available Hotels in the City June 4-6*, respectively). The data regarding the first three variables are retrieved from ISTAT database, whereas the variable *City Airbnb Penetration* is computed for each city by accessing the database of AirDNA, a business analytics platform partner of Airbnb, and the number of hotels available for booking on Booking.com in the given city for the specific dates is, of course, retrieved from Booking.com. While the number of inhabitants and the per-capita income are intuitive, the other variables at the city level require additional explanation. Specifically, we obtained estimates for the tourist flow (in terms of booked nights) in traditional accommodation facilities for the considered dates June 1-3 and June 4-6, respectively, in each city in our sample, by taking advantage of the fact that the extensive ISTAT database allows to derive detailed tourist flow information for specific periods and geographic areas. This variable is used to control for the level of attractiveness of each city in the considered periods, which in turn is very likely to affect hotel prices. To compute our variable of interest, i.e., *City Airbnb Penetration*, we have accessed Airbnb data provided by AirDNA and retrieved the estimated number of booked nights (related to two-nights periods, as considered in our study) in active properties listed on Airbnb, as the product between the Airbnb occupancy rate and the total number of nights available for two-nights period considering the properties available for booking on Airbnb in the given city in the considered periods.[2] This measure is essentially the estimated demand for a two-nights period in properties listed on Airbnb in the given city regarding the considered dates. Afterwards, for each specific period considered in our study (June 1-3 and June 4-6, respectively), we divided this measure by the above described tourist flow in the given city to obtain the variable *City Airbnb Penetration*. As this tourist flow is based on data of tourists registered in hotels and other traditional providers, the computed ratio is essentially a ratio between demand of Airbnb and demand in hotels and similar traditional players in the given city for the considered dates. As such, it is a direct measure of the competition generated by the presence of Airbnb given that it captures the strength of Airbnb's hosts in attracting demand relative to that of the traditional hospitality industry (hotels and similar traditional providers) across different geographical areas.[3] Note that from Table 1 the values for this variable approximately range from 0.015 to 0.519 for the considered dates, which suggests quite large variability across different cities in the ability of Airbnb's hosts to attract demand relative to the traditional industry. Moreover, although at first blush the values of this ratio in Table 1 may seem small, they actually reveal that, at least in some cities, Airbnb has gained very large relevance. For instance, a value of 0.3 suggests that Airbnb alone has been able to capture one third of the demand captured by the entire traditional hospitality system. Viewing Airbnb as one distributed accommodation provider in a given city, this is certainly a relevant number, which suggests that Airbnb is actually able to cover a significant portion of the demand in certain cities. In addition, as we are interested in examining how the differences in terms of Airbnb's competitive strength across cities

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[2] Note that, according AirDNA, the occupancy rate is computed as the percentage of nights actually booked over the total offered nights taking into account all active facilities listed on Airbnb in the considered period. Facilities are considered active by AirDNA if they are made available for booking by owners. Therefore, multiplying the occupancy rate by the number of active nights (referred to a two-nights period) considering the properties available for booking on Airbnb in the given city in the considered periods, we obtain the number of booked nights (related to a two-nights period) in active properties listed on Airbnb.

[3] Despite the above measure, i.e., *City Airbnb Penetration*, is probably the most accurate manner to capture Airbnb's competitive threat in the eyes of incumbents (based on available data), we have also shown robustness of our results simply using the Airbnb's occupancy rate, which captures the effectiveness of Airbnb's hosts in selling off their capacity. The results of these additional analyses can be made available by the authors.

influence incumbents' pricing decisions, it is mostly the emergence of large variability in this ratio across cities, rather than the absolute values in each city, that matters to our scopes. The number of hotels available for booking at the moment of reservation on Booking.com in the given city for the specific dates (namely, *Number of Available Hotels in the City June 1-3* and *Number of Available Hotels in the City June 4-6*, respectively) is particularly important as it allows us to disentangle the effect of the competition induced by Airbnb (measured by the variable *City Airbnb Penetration*) from the effect of the competition coming from the other hotels in the given city that are available for booking in the considered dates (at the moment of reservation). As this variable varies depending on the considered dates (i.e., June 1-3 or June 4-6) because of the changes in the hotel room availability for certain dates is certainly a more accurate measure of the actual hotel competition at the moment of reservation than simply considering the total number of hotels located in the given city (irrespective of their room availability).

From Table 1, it can be observed that Rome is by far the largest and most visited city but ranks fourth regarding the variable *City Airbnb Penetration*. More interestingly, Venice ranks third with regard to the number of visitors, but ranks penultimate in terms of Airbnb penetration. Milan is the second largest and most visited city and also ranks second in terms of Airbnb penetration, whereas Bologna have intermediate levels of tourist flow but rank particularly high in terms of Airbnb penetration. In contrast, Ravenna displays very low levels of Airbnb penetration, while still having intermediate level of touristic presence. It is also shown that cities in Southern Italy (Naples and Palermo) suffer from an economic gap as compared with cities in Northern and Central Italy displaying the lowest per-capita income but, at the same time, considerably high Airbnb penetration. Particularly, Palermo ranks first in this variable. It is, instead, a Northern Italy city (Ravenna) that shows the lowest Airbnb penetration. Overall, these statistics suggest that the role of the different competitive strength of Airbnb in different cities is not straightforward, as there seems to be no clear relationship with the other main cities features. This is further confirmed by the correlation matrix (in the interest of length correlation statistics are omitted and can be made available by the authors).

After the above 13 cities were selected, we created a crawler simulating the behavior of travelers in the two considered scenarios (scenario 1 and scenario 2) on Booking.com. Note that we chose the simplest search on this website where destination, check-in and check-out dates, number of cameras, and number of adults were the only requested information. We only restricted the search to hotels because they are our focus, implying that other facilities listed on Booking.com such as apartments or bed & breakfast, were automatically excluded from the search. The destination was in turn one of the 13 selected cities, check-in date was June 1st (June 4th), 2018, check-out date was June 3rd (June 6th), 2018, respectively for the two scenarios of weekend and weekdays trips identified above. We automatically retrieved all offerings and their characteristics displayed to consumers on Booking.com after each search. In particular, for the first scenario (weekend trip) we retrieved 13,906 different price offerings from 1,998 different available hotels located in the selected cities, whereas for the second scenario (weekdays trip) we retrieved 22,866 different price offerings from 2,232 different available hotels located in the selected cities. However, as we need to include hotel star category (the variable *Star Category*) and the average vote provided by customers to hotels on Booking.com (*Hotel Vote on Booking.com*) as independent variables in our regression models to control for quality and satisfaction levels, we removed hotels that did not display any star category as well as those that did not display any vote from consumers on Booking.com. This small restriction reduced the sample for the first scenario to 13,470 different available price offerings from 1,921 different available hotels located in the selected cities, whereas for the second scenario to 22,102 different price offerings from 2,039 different available hotels located in the selected cities. Afterwards, as our study focuses on the effect of sharing economy on incumbents' pricing decisions at the hotel level, we computed for each hotel the average price (*Average Hotel Price*) and the best deal (*Minimum Hotel Price*) using these price offerings displayed on Booking.com. These two variables are the dependent variables in our regression models. Therefore, our final sample includes 1,921 hotel observations (of which 768 related to 4-5 star hotels and 1,153 related to 1-3 star hotels) for the weekend trip scenario, and 2,039 hotel observations (of which 819 related to 4-5 star hotels and 1,220 related to 1-3 star hotels) for the weekdays trip scenario. In addition to the mentioned variables, we also introduce as control variables the number of rooms of each hotel (*Hotel Room Number*), which represents the supply of each hotel, a dummy indicating whether the hotel belongs to a hotel chain or is independent (*Chain*), and a set of dummies indicating whether the hotel displays certain important service characteristics such as the presence of a spa and wellness center (*Spa & Wellness Center*), the presence of a swimming pool (*Swimming Pool*), the presence of a restaurant (*Restaurant*), the presence of a parking space (*Parking*), as well as whether it offers free Wi-Fi connection (*Free Wi-Fi*). Finally, we also control for a dummy variable indicating whether the hotel is located in a city by the seaside (*Seaside Place*).

All variables are reported in Tables 2 and 3 for the two scenarios, respectively, together with the relative descriptive statistics. In both tables we also separate each sample (weekend trip and weekdays trip) in two different subsamples: one considering only four and five star hotels and the other one encompassing hotels from one to three stars. This is because, according to our hypotheses, we aim to investigate whether and how the hotel pricing strategy as a response to a different level of penetration of Airbnb in different cities changes based on the star category. As the descriptive statistics of the two scenarios are similar, we briefly comment only those related to the weekend trip (Table 2), pointing out that average prices and best price deals offered for weekend trips tend to be higher than those offered for weekdays trips. From Table 2, it is noteworthy that average price and best price deals for a two-night period are on average quite higher in 4-5 star hotels (the means are approximately 640 and

412 dollars, respectively) than in 1-3 star hotels (283 and 208 dollars, respectively).[4] Furthermore, as expected, 4-5 star hotels are more likely to be part of hotel chains as compared with their 1-3 star counterparts (about 15% versus 2% of the observations, respectively), to offer spa and wellness center (14.8% versus 1.5%), swimming pool (11.7% versus 1%), restaurant (54.9% versus 10.9%), parking (62.8% versus 46.1%) and free Wi-Fi connection (99% versus 97.5%) services as well as they receive better votes from customers, although the difference is not particularly high (about 8.4 versus 7.9, respectively).

5. Empirical Analysis

5.1 Main results

Due to the cross-sectional nature of our full sample, for each scenario (weekend and weekdays trips) we performed robust OLS regression models for the two subsamples of 1-3 star hotels and 4-5 star hotels, respectively, as well as for the full sample. In Table 4 we report the results of the regression models for the weekend trip scenario (which mainly captures the case of accommodation search for short vacation purposes), whereas Table 5 presents the same results for the weekdays trip scenario (which mainly captures the case of accommodation search for short job/business-related purposes).

In the first two columns of Table 4 and 5 we report the results under the sample of only 1-3 star hotels, with average and minimum hotel price as a dependent variable, respectively. In these two columns of each table, the hotel-level characteristics have mostly the expected sign, with star category and customers' vote on Booking.com positively and significantly influencing hotel prices. In contrast, the effect of hotel ownership (chain vs. independent hotel) is mostly insignificant, thus suggesting that belonging to a chain does not necessarily result in a lower price as implied by economies of scale. This is possibly because this "economies of

[4] Note that we have compared the average prices available on Airbnb with those offered by hotels, across the cities included in the sample for the considered periods and found that the former are in general considerably lower than those of both 1-3 and 4-5 star hotels, largely confirming the common belief that Airbnb puts downward pressure on prices. In the interest of length, this comparison is available upon request.

scale" effect is already captured by the presence of number of hotel rooms, which has indeed a negative and significant impact on prices for 1-3 star hotels. The effect of services offered by the hotel tends to be mostly significant and negative for the presence of swimming pool, restaurant, and parking space. This is possibly because these services are offered upon additional payments in 1-3 star hotels, thus decreasing the price of the basic service (i.e., the price for the room) under a logic of add-on pricing (Geng et al., 2018). In contrast, the presence of the spa and wellness center is positive and significant as the presence of this particular service is probably an element of differentiation also for low-medium end hotels (specifically for 3-star hotels), which contributes to raise the hotel prices. Regarding the city-level variables, *ceteris paribus*, both average prices and best deals (i.e., minimum prices) of 1-3 star hotels tend to be higher in cities attracting more tourists, having lower population, located in a seaside area, and having lower number of hotels available for booking at the moment of accommodation search. The latter effect is important because it captures the inter-hotel competition suggesting, as expected, lower prices when the number of hotels available for booking increases. The effect of the city per-capita income is instead ambiguous being significant and positive for weekdays stay, and significant and negative for weekend stay on both average prices and best deals, possibly suggesting different dynamics between the two types of accommodation offers, and thus the two types of consumers looking for these types of accommodation. Moving to our variable of interest, in developing our hypothesis *H1* we have argued that 1-3 star hotels tend to be naturally direct competitors of Airbnb for the segment of price-conscious consumers in search of accommodation for vacation purposes (e.g., weekend scenario). Competition between 1-3 star hotels and Airbnb is instead more limited for consumers looking for accommodation due to job/business purposes (e.g., weekdays scenario) as sharing economy in the hospitality industry has emerged as a suitable alternative especially for leisure travelers rather than consumers travelling for job/business purposes, given that the former tend to be much more price-sensitive and have higher flexibility in planning their travel. Therefore, for 1-3 hotels, the effect of a higher penetration of Airbnb in certain cities should be a straightforward competition effect for weekend accommodation offers (for consumers traveling due to vacation purposes), thus unavoidably leading them to set lower average prices and best deals to better compete and reduce the loss of demand due to the new entrant. In contrast, this downward pressure on prices in cities where Airbnb represents a more relevant threat should not be observed during weekdays as Airbnb does not target consumers travelling for job/business purposes, thus leaving 1-3 hotels more room to maneuver their prices. In turn this should lead to an insignificant competition effect induced by the sharing economy in this case. The results reported in the first two columns of Tables 4 and 5 fully support these arguments as the coefficient of the variable *City Airbnb Penetration* is significant and negative for both average prices and best deals for the weekend scenario (Table 4), whereas it is not significant for both average prices and best deals for the weekdays scenario (Table 5). Overall, the results on 1-3 star hotels confirm our hypothesis *H1* suggesting that the response of these hotels to the higher penetration of Airbnb in certain cities is an intuitive and natural price reduction for the consumer segment the two types of players tend to capture (i.e., the segment of more price-conscious consumers who travel for vacation purposes). In contrast, as the sharing economy in the hospitality industry has not emerged as a strong alternative for business travelers given their less sensitivity to price, 1-3 star hotels do not set lower prices in cities where Airbnb is more effective in attracting demand as compared with cities where Airbnb is less effective, when the accommodation search is related to working days.

In the second two columns of each table, we report the results under the sample of only 4-5 star hotels, with average and minimum hotel price as a dependent variable, respectively. The effect of control variables is similar as before, with some exceptions. Indeed, also for 4-5 star hotels, star category, customers’ vote on Booking.com, the presence of a spa and wellness center, city touristic flow, and seaside location positively and significantly influence both hotel average prices and best deals, whereas city population, the number of hotels available for booking in the given city at the moment of reservation, and to some extent the presence of parking space exert a negative and significant effect on them, with the role of hotel ownership being mostly insignificant. There exist differences as compared with the sample of 1-3 star hotels regarding the effect of the hotel room number, which is largely insignificant for the 4-5 star hotels, as these types of hotels mostly pursue product differentiation rather than cost advantage, and thus the impact of size-related economies on prices is limited. Partially similar to the case of 1-3 star hotels, the effect of the city per-capita income for 4-5 star hotels tends to be significant and negative on hotel prices. The effect of services such as restaurant (free Wi-Fi) is instead positive (negative) but significant only in a few cases, while the effect of presence of a swimming pool is largely insignificant for 4-5 star hotels. With regard to our variable of interest, i.e., *City Airbnb Penetration*, we have advanced in *H2* that 4-5 star category hotels should set higher best deals, and thus also higher average prices, in cities where Airbnb is a more relevant competitive threat. This is because the strong downward pressure on prices induced by Airbnb's disruptive competition would require this type of hotels to reduce the price of their best deals (i.e., Minimum Hotel Price) considerably, which would be negatively perceived by their core target, i.e. high-end consumers. Therefore, these hotels should instead choose to concentrate more on their core segment and tilt away from the game of head-to-head price-based competition against this new player to capture slices from deal-seekers demand (normally useful for disposing excess capacity), by actually setting higher prices for their best deals (and thus their average prices). Higher prices should be therefore interpreted as a clear intention to signal their higher quality positioning as compared with Airbnb and 1-3 star hotels to avoid being trapped into the increasingly fierce price competition determined by the entrance of Airbnb. Because product positioning must be coherent we also argued that this effect on prices of 4-5 star hotels should emerge irrespective of whether the hotel room reservation is related to a weekend trip (i.e., accommodation due to vacation reasons) or weekdays trip (i.e., accommodation due to job/business reasons). The results in Tables 4 and 5 largely confirm these intuitions as the coefficient of the variable *City Airbnb Penetration* is shown to be positive and significant with regard to best deals (minimum prices) and average prices in both tables. Overall, our results on 4-5 star hotels confirm our hypothesis *H2*, suggesting that these hotels respond to the higher penetration of Airbnb by moving far from the new entrant for deal-seekers and signaling with greater emphasis that they target a different segment, i.e. high-end consumers. This pricing strategy is naturally coherent in the sense that it does not change along the days of the week (weekend or weekdays). By setting higher prices, 4-5 star hotels indeed know they lose some demand from more price-conscious consumers, but at the same time can extract more surplus from consumers who are willing to recognize their higher quality.

Finally, in the last two columns of Table 4 and 5 we report the results under the full sample including both 1-3 and 4-5 star hotels. While the effects of control variables are mostly confirmed given their large consistency across the two subsamples, it is clear that the considerations on the variable *City Airbnb Penetration* for the full sample hinge upon the different effects we have discussed for the two separate subsamples. Indeed, as the effect of a higher penetration of Airbnb is mostly a price increase for 4-5 star hotels and mostly a price decrease or insignificance for 1-3 star hotels, the overall effect depends on which of these contrasting effects is dominant. As expected, given these contrasting effects, it turns out that, for the full sample, the coefficients of our variable of interest tend to be largely insignificant, with the only exception of a slightly significant and positive coefficient for the subsample of weekdays stay and average price as a dependent variable.

Summing up, our results suggest that hotels actually react adjusting their pricing strategies in different cities according to the different degree of competitive strength of Airbnb in these cities. Interestingly, these adjustments differ depending on whether hotels target high-end consumer segments or not as well as on the type service offer. Specifically, in cities where

Airbnb tends to be a more dangerous threat, 4-5 star hotels set higher prices to signal higher product differentiation and concentrate more on their targeted segment, whereas 1-3 star hotels set lower prices in order to maintain market shares in the segment of price-conscious consumers who travel due to vacation purposes (consumers typically searching for weekend accommodation).

5.2 Robustness check

In this sub-section we show robustness of our results for the weekend accommodation search by considering another two-nights stay weekend in the same month. The reason of this robustness check is due to the fact that the weekend sample used in the main analysis considers accommodation search related to the specific weekend June 1-3, 2018. As mentioned, this weekend included the Italian Republic celebration (June 2nd). While, falling on Saturday in 2018, the presence of this holiday in the sample does not increase the number of nights travelers may search an accommodation for, it might still influence the pricing decisions of hotels because certain events related to the celebration may occur in the main touristic cities in the country, thus increasing their attractiveness during this specific weekend. As result, the effect of Airbnb's penetration on hotels' pricing decisions, as measured using this specific sample, may end up being not representative of a generic weekend. We demonstrate that this is not a concern, using a sample related to a different weekend for which price data refer to the same booking date as that of the main samples (i.e., March 2nd, 2018). In particular, we consider the subsequent weekend (June 8-10) in order to have an appropriate results comparison with the sample related to the weekdays (recall this sample is related to working days June 4-6). Descriptive statistics regarding this additional sample are similar to those obtained for the main samples, and therefore are omitted in the interest of length. In Table 6, we report the results of the OLS regression models organized, as usual, for 1-3 star hotels, 4-5 star hotels, and full sample. As it can be observed, in all columns the results largely confirm those obtained for the sample related to the weekend June 1-3 (i.e., Table 4).

That is, 1-3 (4-5) star hotels set lower (higher) prices in areas where Airbnb's penetration is stronger, thus further strengthening our main message on the different price response of different types of incumbents.

6. Discussion and Conclusion

In this paper, we have investigated incumbents' pricing reactions to the growing presence of a novel and disruptive phenomenon, namely the sharing economy. We have discussed the importance to investigate the impact of sharing economy players (e.g., Airbnb, Uber, etc…) on incumbents' business, in light of the fact that, as compared with traditional new entrants, these new players can enable extremely competitive prices and ensure a more capillary diffusion of products/services by relying on geographically distributed and underutilized resources which are owned by a multitude of individuals (Sundararajan, 2016; Guttentag and Smith, 2017; Zervas et al., 2017). We have explained how incumbents react in terms of pricing to the unprecedented threat entailed by sharing economy players. Moreover, we have shed light on how these price reactions depend on certain characteristics of the incumbents, the segments they target and the type of product/service offer. We have addressed these important research questions in the context of the hospitality industry since there is broad consensus on the fact that it can be considered as exemplificative of the disruptive effect of the sharing economy (Blal et al., 2018), and more importantly, because pricing strategies are particularly important in this industry given its intrinsic characteristics. Specifically, relying on a large sample of hotel price offerings in the Italian market, we have examined how hotels' price reactions to Airbnb's different penetration in different geographical areas change depending on the hotel star category as well as on whether the service offer relates to weekend or weekdays accommodation, and thus reasonably on the motives behind the accommodation search (vacation or business purposes).

Our major findings are as follows. With regard to low/medium-end incumbents (i.e., 1-3 star category hotels), consistently with prior studies we have found that these incumbents tend to set lower prices in cities where sharing economy players (exemplified by Airbnb in the hospitality context) have higher penetration and thus represent a more relevant threat to incumbents. However, we add to extant knowledge that this price-cutting effect is likely to occur for service offers related to weekend accommodation, rather than to weekdays accommodation. This is because sharing economy players in the hospitality industry (e.g., Airbnb) have emerged as suitable alternatives mostly for consumers traveling for vacation or other recreational purposes rather than due to job/business reasons, given that the former usually display much higher price sensitivity. This implies a reduced competitive threat in the latter case with no pressure to reduce prices, which indeed remain, *ceteris paribus*, unchanged across cities irrespective of the sharing economy's penetration.

Interestingly, with regard to incumbents targeting high-end consumers (i.e., 4-5 star hotels) we have found a positive effect of sharing economy's penetration on prices practiced by these incumbents in the sense that they tend to set higher prices in cities where sharing economy players (i.e., Airbnb) are more effective in capturing demand. The rationale of this apparently counter-intuitive result is that the sharing economy puts strong pressure on high-end incumbents to reduce the prices for occasionally attracting deal-seekers to clear up capacity, which would be a strategy too inconsistent with their higher service quality, and would probably distance them away from their core business, i.e., high-end consumers. Therefore, in areas where the sharing economy has become particularly strong in attracting demand, these incumbents tend to signal the higher product/service quality by reducing the price discount on the standard rate, and concentrate more on extracting surplus from their core target rather than engaging in head-to-head price competition for price-conscious consumers. Moreover, in line with marketing theories on product positioning consistency, we have found that incumbents targeting high-end consumers maintain this pricing strategy irrespective of the accommodation period (weekend or weekdays).

Although our findings are obtained for the specific context of the hospitality industry, they can still offer important implications with regard to the impact of the sharing economy on traditional industries at a more general level. This is because the industries affected by the sharing economy share similar features (e.g., product differentiation, market segmentation, the need of supply-demand matching) and the characteristics of the sharing economy are similar across various industries (the fact that this economy model grounds on the exploitation of underutilized small resources which are owned by a multitude of geographically distributed resource providers and can be made available at very competitive prices through Internet-enabled platforms). Specifically, our findings can be useful to incumbents in traditional industries, sharing economy firms, consumers, and policy makers. First, we inform incumbents on how the growing relevance of the sharing economy is actually shaping their pricing decisions, and thus their pricing power. We also inform them on how they tend to adjust their pricing strategy as a response to the penetration of sharing economy firms depending on variables such as the intrinsic quality offered and the consequent targeted consumer segments (i.e., low/medium-end versus high-end segments) as well as specific product/service offers' characteristics (e.g., offers for the weekend versus working days). Second, we increase sharing economy firms' understanding on their disruptive role in the traditional industries. In this respect, our study highlights that sharing economy players are serious competitors to cope with, as they are shown to significantly influence pricing decisions of incumbents. For instance, in the context of the hospitality industry, although Airbnb CEO Brian Chesky has often stated that Airbnb does not directly compete with the hotel industry because their users are not typical hotel customers (Business Insider, 2017), evidence from our study suggests that Airbnb has become a serious substitute of these incumbents leading them to react modifying their pricing strategy according to the higher or lower efficacy of this sharing economy player in capturing demand in different geographical areas. Finally, our findings have important implications for consumers and thus also for policy makers, as the presence of sharing economy firms does not only introduce very competitive prices *per se*, but also changes the pricing behavior of incumbents in a cumbersome manner. In particular, consumers who are willing to pay for high-end products/services provided by professional providers (e.g., 4-5 star hotels, luxury taxi companies) should be aware that incumbents' prices tend to increase in markets characterized by large presence of sharing economy firms. In contrast, consumers who look for low-medium budget products/services (e.g., 1-3 star hotels, shareable taxi services) should expect a price benefit from the higher penetration of sharing economy firms in certain geographical areas, as prices will tend to be lower in these areas. This is because the lower prices offered by the multitude of resource/service providers in sharing economy platforms will also be likely to induce lower prices for this type of products/services also in the traditional business of incumbents. Therefore, the consequences for consumer welfare is not straightforward, with certain consumer segments benefiting from the emergence of the sharing economy and other consumer segments possibly being negatively affected if the higher incumbents' prices are not adequately compensated by an increase in the quality of the products/services.

Being among the first works examining the impact of sharing economy on traditional industry, our study has some limitations, which, however, can offer room for future research. First, although we believe the findings (and the relative implications) derived in the context of the hospitality industry are quite general in light of the above considerations, the extension of our study to other industries "disrupted" by the sharing economy is desirable. Second, from an empirical viewpoint, our study could also be extended to other geographical markets (e.g., other countries) to make the sample more heterogeneous in terms of sharing economy's penetration in different areas. Third, in the present study we are interested in how sharing economy affects incumbents' pricing response across different geographical areas (e.g., cities) and different product/service offer characteristics (e.g., offers for weekend versus offers for weekdays), rather than in its temporal influence. As such, we focus on incumbents' price observations related to a few specific dates across different cities, and offered well in advance with respect to the dates when the accommodation is needed. Nevertheless, a future improvement could include multiple price observations over time for the same accommodation search in order to investigate whether certain price adjustments due to the sharing economy vary depending on whether booking is done in advance or very close to the date of departure. The presence of observations of multiple booking days would allow to shed light on the dynamics related to both incumbents' and newcomers' capacity utilization. Similarly, a higher number of dates for accommodation during the year could be considered to check the impact of seasonality. More in general, in this paper we have focused on the effect of sharing economy players on incumbents' pricing decisions and specifically on incumbents' price levels. In future studies, it would be worthwhile to investigate the effect of the sharing economy on the number and variability of incumbents' price offerings, which would shed light on whether the increasing power of sharing economy players reduces or enhances segmentation and price discrimination ability of incumbents. Finally, future research should certainly contribute to the understanding of the disruptive impact of the sharing economy on the traditional industries by investigating how the effect of sharing economy players' growth (e.g., Airbnb's growth) and the consequent incumbents' reactions (such as those identified in the present study) end up influencing profitability of both types of players as well as the consumer welfare.

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Table 1. City statistics.

	City Population	City Per-capita Income (Euros)	City Touristic Flow June 1-3 (number of booked nights)	City Touristic Flow June 4-6 (number of booked nights)	City Airbnb Penetration (ratio computed for June 1-3)	City Airbnb Penetration (ratio computed for June 4-6)	Number of Available Hotels in the City June 1-3	Number of Available Hotels in the City June 4-6
Bologna	388,367	20,571	16,459	7,912	0.169	0.352	79	81
Florence	382,258	18,559	56,811	29,478	0.120	0.231	230	263
Genoa	583,601	18,307	11,246	5,406	0.084	0.174	52	50
Milan	1,351,562	23,849	69,828	33,565	0.212	0.442	300	303
Naples	970,175	10,531	16,410	11,716	0.206	0.289	119	108
Padua	209,829	19,457	9,511	4,572	0.056	0.117	39	38
Palermo	673,735	10,844	5,937	4,239	0.371	0.519	39	40
Pisa	90,488	18,183	10,187	5,286	0.061	0.117	35	37
Ravenna	159,057	16,641	16,987	8,165	0.015	0.031	17	15
Rome	2,873,494	17,825	153,326	79,556	0.139	0.268	711	729
Turin	886,837	17,217	23,300	11,200	0.115	0.238	78	99
Venice	261,905	17,577	66,874	32,144	0.051	0.107	182	230
Verona	257,353	18,126	13,270	6,379	0.088	0.183	40	46

Table 2. Descriptive statistics by hotel star category for weekend accommodation sample.

	1-3 Star Hotels		4-5 Star Hotels		Full Sample	
	Mean	Std. Deviations	Mean	Std. Deviation	Mean	Std. Deviations
Star Category	2.577	0.673	4.125	0.331	3.196	0.944
Hotel Vote on Booking.com	7.933	0.727	8.399	0.592	8.120	0.713
Chain	0.020	0.140	0.150	0.357	0.072	0.258
Hotel Room Number	31.711	33.387	89.230	74.189	54.707	60.513
Swimming Pool	0.010	0.097	0.117	0.322	0.053	0.223
SPA & Wellness Center	0.015	0.121	0.148	0.356	0.068	0.252
Restaurant	0.109	0.312	0.549	0.498	0.285	0.452
Parking	0.461	0.499	0.628	0.484	0.529	0.499
Free Wi-Fi	0.975	0.157	0.990	0.102	0.981	0.137
City Touristic Flow June 1-3	83,967	57,417	85,703	54,624	84,661	56,309
City Per-capita Income (Euros)	18,247	2,992	18,563	3,442	18,373	3,183
City Population	1,486,916	1,128,349	1,518,193	1,085,956	1,499,420	1,111,415
Seaside Place	0.598	0.490	0.560	0.497	0.583	0.493
Number of Available Hotels in the City June 1-3	369.662	275.640	378.478	261.749	373.186	270.138
City Airbnb Penetration	13.8%	6.0%	14.9%	5.9%	14.2%	6.0%
Average Hotel Price (Dollars)	283.04	155.14	639.75	739.89	425.65	513.50

Minimum Hotel Price (Dollars)	207.63	125.37	411.88	334.35	289.29	253.19

Table 3. Descriptive statistics by hotel star category for weekdays accommodation sample.

	1-3 Star Hotels		4-5 Star Hotels		Full Sample	
	Mean	Std. Deviations	Mean	Std. Deviation	Mean	Std. Deviations
Star Category	2.580	0.676	4.133	0.340	3.204	0.949
Hotel Vote on Booking.com	7.977	0.719	8.418	0.590	8.154	0.704
Chain	0.020	0.142	0.142	0.349	0.069	0.254
Hotel Room Number	32.134	32.845	87.864	73.316	54.519	59.578
Swimming Pool	0.007	0.081	0.112	0.316	0.049	0.216
SPA & Wellness Center	0.014	0.117	0.144	0.351	0.066	0.249
Restaurant	0.101	0.301	0.553	0.497	0.282	0.450
Parking	0.455	0.498	0.617	0.487	0.520	0.500
Free Wi-Fi	0.975	0.157	0.989	0.104	0.980	0.139
City Touristic Flow June 4-6	43,100	29,231	42,699	28,398	42,939	28,893
City Per-capita Income (Euros)	18,286	2,846	18,545	3,332	18,390	3,052
City Population	1,452,143	1,131,545	1,464,186	1,089,017	1,456,980	1,111,404
Seaside Place	0.583	0.493	0.563	0.496	0.575	0.494
Number of Available Hotels in the City June 4-6	384.986	273.241	382.392	264.673	383.944	269.770
City Airbnb Penetration	0.260	0.102	0.279	0.107	0.267	0.104
Average Hotel Price (Dollars)	258.87	132.01	611.60	650.75	400.55	458.59
Minimum Hotel Price (Dollars)	186.32	105.06	387.74	318.52	267.26	238.91

Table 4. OLS regression models for weekend accommodation sample

	Sample of 1-3 star hotels		Sample of 4-5 star hotels		Full Sample	
	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable
Star Category	0.227***	0.249***	1.001***	0.801***	0.306***	0.305***
	(0.014)	(0.017)	(0.059)	(0.046)	(0.012)	(0.013)
Hotel Vote on Booking.com	0.201***	0.212***	0.416***	0.397***	0.268***	0.270***
	(0.015)	(0.017)	(0.027)	(0.024)	(0.014)	(0.014)
Chain	-0.049	-0.003	-0.078†	0.003	-0.117**	-0.042
	(0.078)	(0.086)	(0.041)	(0.036)	(0.040)	(0.036)
Hotel Room Number	-0.0005*	-0.0007*	-0.0000	-0.0003	-0.0005*	-0.0007***

	(0.0002)	(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0002)
Swimming Pool	-0.200*	-0.227*	-0.039	-0.055	0.016	-0.025
	(0.095)	(0.114)	(0.051)	(0.043)	(0.060)	(0.049)
SPA & Wellness Center	0.265***	0.257***	0.144**	0.106*	0.385***	0.293***
	(0.078)	(0.079)	(0.051)	(0.043)	(0.054)	(0.045)
Restaurant	-0.060†	-0.085*	0.018	0.030	0.061*	0.037
	(0.033)	(0.036)	(0.032)	(0.031)	(0.025)	(0.025)
Parking	-0.033	-0.022	-0.040	-0.068*	-0.049*	-0.049*
	(0.022)	(0.024)	(0.031)	(0.030)	(0.020)	(0.020)
Free Wi-Fi	0.072	0.019	-0.257†	-0.242†	-0.080	-0.100
	(0.055)	(0.062)	(0.132)	(0.131)	(0.071)	(0.069)
City Touristic Flow 1-3 June	0.480***	0.481***	0.598***	0.618***	0.548***	0.544***
	(0.023)	(0.027)	(0.043)	(0.038)	(0.023)	(0.023)
City Per-capita Income	-0.351***	-0.355***	-0.796***	-0.742***	-0.495***	-0.471***
	(0.089)	(0.098)	(0.137)	(0.122)	(0.081)	(0.078)
City Population	-0.120***	-0.085**	-0.262***	-0.260***	-0.166***	-0.136***
	(0.028)	(0.030)	(0.041)	(0.037)	(0.025)	(0.026)
Seaside Place	0.069†	0.077*	0.087	0.130*	0.075*	0.099**
	(0.036)	(0.039)	(0.060)	(0.056)	(0.034)	(0.034)
Number of Available Hotels in the City June 1-3	-0.001***	-0.001***	-0.0009***	-0.0009***	-0.001***	-0.001***
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
City Airbnb Penetration	-0.715**	-0.917***	0.725*	1.049***	-0.243	-0.319
	(0.272)	(0.288)	(0.338)	(0.303)	(0.226)	(0.230)
Constant	3.586***	2.780**	3.803**	3.606**	4.240***	3.346***
	(0.866)	(0.954)	(1.376)	(1.218)	(0.789)	(0.748)
Number of observations	1,153	1,153	768	768	1,921	1,921
R^2	0.534	0.494	0.705	0.708	0.647	0.640

Robust standard errors in parentheses - † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5. OLS regression models for weekdays accommodation sample

	Sample of 1-3 star hotels		Sample of 4-5 star hotels		Full Sample	
	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable	Average Hotel Price as a dependent variable	Minimum Hotel Price as a dependent variable
Star Category	0.211***	0.238***	0.928***	0.719***	0.318***	0.313***
	(0.012)	(0.015)	(0.054)	(0.042)	(0.011)	(0.011)
Hotel Vote on Booking.com	0.216***	0.222***	0.420***	0.405***	0.291***	0.286***

	(0.013)	(0.015)	(0.026)	(0.023)	(0.013)	(0.013)
Chain	0.007	0.027	-0.030	0.042	-0.049	0.016
	(0.083)	(0.062)	(0.040)	(0.035)	(0.040)	(0.032)
Hotel Room Number	-0.0008***	-0.001***	-0.0002	-0.0003	-0.0006**	-0.0007***
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Swimming Pool	-0.188†	-0.225*	-0.046	-0.051	0.004	-0.026
	(0.105)	(0.109)	(0.048)	(0.041)	(0.054)	(0.044)
SPA & Wellness Center	0.215**	0.243***	0.118*	0.116**	0.331***	0.278***
	(0.077)	(0.071)	(0.048)	(0.043)	(0.049)	(0.041)
Restaurant	-0.026	-0.044	0.069*	0.052†	0.124***	0.080***
	(0.031)	(0.031)	(0.030)	(0.028)	(0.023)	(0.022)
Parking	-0.042*	-0.038†	-0.041	-0.056*	-0.070***	-0.066***
	(0.020)	(0.022)	(0.030)	(0.028)	(0.019)	(0.018)
Free Wi-Fi	0.008	-0.013	-0.176	-0.141	-0.127*	-0.116†
	(0.048)	(0.057)	(0.147)	(0.137)	(0.062)	(0.062)
City Touristic Flow 4-6 June	0.382***	0.401***	0.473***	0.489***	0.454***	0.464***
	(0.022)	(0.024)	(0.041)	(0.037)	(0.023)	(0.021)
City Per-capita Income	0.129†	0.181*	-0.175	-0.168†	0.022	0.048
	(0.073)	(0.079)	(0.112)	(0.097)	(0.067)	(0.063)
City Population	-0.203***	-0.179***	-0.283***	-0.260***	-0.237***	-0.208***
	(0.023)	(0.025)	(0.040)	(0.036)	(0.023)	(0.022)
Seaside Place	0.171***	0.194***	0.198***	0.223***	0.174***	0.195***
	(0.032)	(0.035)	(0.053)	(0.046)	(0.031)	(0.029)
Number of Available Hotels in the City June 4-6	-0.0005***	-0.0007***	-0.0005**	-0.0006***	-0.0006***	-0.0007***
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
City Airbnb Penetration	-0.027	-0.142	0.608**	0.586**	0.225†	0.115
	(0.141)	(0.154)	(0.212)	(0.200)	(0.129)	(0.126)
Constant	0.905	-0.476	-0.412	-0.334	0.901	-0.084
	(0.823)	(0.884)	(1.297)	(1.162)	(0.760)	(0.716)
Number of observations	1,220	1,220	819	819	2,039	2,039
R^2	0.553	0.528	0.705	0.704	0.680	0.682

Robust standard errors in parentheses - † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6. Robustness check using an additional weekend accommodation sample

	Sample of 1-3 star hotels		Sample of 4-5 star hotels		Full Sample	
	Average Hotel Price as a dependent	Minimum Hotel Price as a dependent	Average Hotel Price as a dependent	Minimum Hotel Price as a dependent	Average Hotel Price as a dependent	Minimum Hotel Price as a dependent

	variable	variable	variable	variable	variable	variable
Star Category	0.211***	0.240***	0.961***	0.767***	0.302***	0.301***
	(0.014)	(0.016)	(0.061)	(0.045)	(0.012)	(0.012)
Hotel Vote on Booking.com	0.204***	0.216***	0.461***	0.432***	0.290***	0.287***
	(0.015)	(0.016)	(0.028)	(0.023)	(0.015)	(0.014)
Chain	0.042	0.103†	-0.033	0.037	-0.047	-0.027
	(0.059)	(0.061)	(0.042)	(0.037)	(0.037)	(0.033)
Hotel Room Number	-0.0009***	-0.001***	-0.0001	-0.0005*	-0.0005*	-0.0008***
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Swimming Pool	-0.196**	-0.215*	0.033	-0.013	0.043	-0.014
	(0.076)	(0.091)	(0.057)	(0.044)	(0.062)	(0.049)
SPA & Wellness Center	0.357***	0.331***	0.132**	0.084*	0.393***	0.290***
	(0.066)	(0.074)	(0.051)	(0.043)	(0.054)	(0.043)
Restaurant	-0.037	-0.046	0.027	0.033	0.079**	0.054*
	(0.035)	(0.036)	(0.033)	(0.029)	(0.026)	(0.024)
Parking	-0.043*	-0.049*	-0.023	-0.039	-0.059**	-0.063***
	(0.022)	(0.022)	(0.031)	(0.029)	(0.019)	(0.019)
Free Wi-Fi	0.042	-0.004	-0.258†	-0.325*	-0.100	-0.133†
	(0.053)	(0.061)	(0.145)	(0.163)	(0.064)	(0.071)
City Touristic Flow 8-10 June	0.449***	0.446***	0.514***	0.503***	0.501***	0.486***
	(0.022)	(0.025)	(0.044)	(0.038)	(0.023)	(0.022)
City Per-capita Income	0.130	0.331†	-0.649**	-0.609**	-0.107	0.014
	(0.161)	(0.174)	(0.245)	(0.206)	(0.150)	(0.140)
City Population	-0.226***	-0.217***	-0.295***	-0.254***	-0.265***	-0.238***
	(0.026)	(0.025)	(0.044)	(0.036)	(0.025)	(0.023)
Seaside Place	0.208***	0.254***	0.248***	0.250***	0.238***	0.260***
	(0.038)	(0.040)	(0.059)	(0.050)	(0.036)	(0.033)
Number of Available Hotels in the City June 1-3	-0.0007***	-0.0008***	-0.0007***	-0.0007***	-0.0008***	-0.0008***
	(0.0001)	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0001)
City Airbnb Penetration	-0.797†	-1.149*	0.670**	0.553**	0.185	0.030
	(0.479)	(0.498)	(0.258)	(0.199)	(0.146)	(0.137)
Constant	0.643	-1.933	3.823	3.761†	2.174	0.501
	(1.661)	(1.798)	(2.517)	(2.056)	(1.546)	(1.437)
Number of observations	1,184	1,184	749	749	1,933	1,933
R^2	0.566	0.550	0.701	0.712	0.666	0.674

Robust standard errors in parentheses - † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$