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Do digital platforms create entrepreneurial opportunities? Evidence from marginal areas

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Abstract

Research Summary: This article enters the debate on the effects of digital platforms on entrepreneurial opportunities by estimating whether the entry of a home-sharing platform shapes entrepreneurial decisions in marginal areas. We add a novel perspective to the literature, as we contend that when economic conditions are unfavorable, digital platforms, acting as External Enablers, stimulate entrepreneurship. We test these arguments on the unique setting of 270 Italian Borghi and the entry of Airbnb, employing a staggered difference-in-difference design. We show that, following the entry of Airbnb, the entrepreneurial activity of the surrounding area increases, with effects that are heterogeneous across sectors and stronger in more depressed areas. We also show qualitative–quantitative evidence of the mechanisms explaining these effects. Finally, we discuss theoretical contributions to digital-entrepreneurship literature and implications.

Managerial Summary: This study provides implications for both prospective entrepreneurs and policymakers willing to

incentivize the creation of new businesses in marginal and remote areas. First, we show that, in marginal locations, digital platforms act as facilitators for entrepreneurs facing a complex and risky decision to embark on new business activities, particularly, if these are along the scope of the platform. This happens because platforms create demand—if not existing—and reduce entry and operating costs by internalizing specific business processes. Second, we offer a clear recommendation to policymakers. We show that digital platforms represent an indirect and effective way of pursuing the development of entrepreneurship in marginal areas. This aspect is relevant as scholars have demonstrated that direct approaches are not always effective.

KEYWORDS
Airbnb, difference in differences, digital platforms, entrepreneurship, External Enablers

1 | INTRODUCTION

The recent phenomenon of digital platforms has captured the attention of scholars and policymakers, as a result of the notable impacts they have had on industries, economies, and social welfare (Barron et al., 2021; Burtch et al., 2018; Carrasco-Farré et al., 2022; Cennamo et al., 2022; Chen et al., 2022; Farronato & Fradkin, 2022; Parker & van Alstyne, 2005). The debate on the topic is dynamic and conflicting, as both positive (Farronato & Fradkin, 2022; Frenken & Schor, 2017; Kim et al., 2023) and negative aspects (Barron et al., 2021; Carrasco-Farré et al., 2022; Chen et al., 2022; Zervas et al., 2017) have emerged regarding the diffusion of digital platforms.

This article enters into—and extends—this field of literature as it offers a novel perspective on the effects of digital platforms by focusing on how they can shape entrepreneurial opportunities and entrepreneurs' decisions. Unlike previous studies, which mainly conducted empirical analyses on urban and economically developed markets (Burtch et al., 2018; Kim et al., 2023), we investigate locations that could benefit from the diffusion of digital platforms in different ways, namely marginal areas.

We define marginal areas, in comparison to urban locations which can exhibit multiple opportunities for entrepreneurs thanks to agglomeration mechanisms (Duranton & Puga, 2004), the possible presence of distinct specializations (Duranton & Puga, 2000), and the fact they can be internationally exposed, as those areas that (i) are characterized by an unfavorable economic outlook, (ii) do not present a clear vocation (even though they may have an unexploited potential), (iii) are often both geographically and economically remote, and (iv) present risky and complex entrepreneurial processes due to the presence of significant and potentially "sunk" entry investments (Dixit, 1989; Lofstrom et al., 2014).

We conjecture that spillovers that arise from digital platforms on entrepreneurship within marginal areas could be different from those of economically developed (urban) contexts. On the one hand, when the market outlook is favorable, and entrepreneurs choose from among various alternatives, digital platforms can enter into competition with these alternatives by offering viable methods to generate income (Burtch et al., 2018), hence raising opportunity costs and deterring entrepreneurship. On the other hand, when the market conditions are unfavorable—that is, in marginal areas—and the risk associated with "sunk" initial investments is present (Lofstrom et al., 2014), digital

platforms can stimulate entrepreneurship in a variety of ways. They can, through network effects (Parker et al., 2016), increase the visibility of the area, and also be subject to international exposure (Stallkamp & Schotter, 2021), thereby creating a contextual demand for business activities where no demand existed before. Likewise, they can lower the amount of resources, and the specificity of investments that are required by entrepreneurs to start and run a business activity (Kim et al., 2023), hence lowering the risk associated with the entrepreneurial decision through a more efficient use of the available underutilized resources (Amit & Han, 2017; Kretschmer et al., 2022). We theorize that when digital platforms enter marginal areas, and result in a technological shift of both the demand and supply sides, they can act as External Enablers (Davidsson, 2015; von Briel et al., 2018), thus creating novel opportunities (Foss & Klein, 2020; Gartner, 1988; Shane, 2000; Shane & Venkataraman, 2000) that can be perceived and exploited by both existing and prospective entrepreneurs.

In essence, this article investigates the following research question: "Do digital platforms foster the creation of new entrepreneurial opportunities and, consequently, entrepreneurial activities in marginal areas?". In other words, we study how digital platforms shape new entrepreneurial decisions by studying the effects—and the mechanisms—through which digital platforms enable and trigger new entrepreneurial opportunities when the market where entrepreneurs operate is characterized by unfavorable and adverse conditions.

To answer this research question, we have studied the world-known Airbnb platform—which has been largely debated because of the negative externalities it can create (Barron et al., 2021; Carrasco-Farré et al., 2022; Chen et al., 2022; Farronato & Fradkin, 2022; Zervas et al., 2017)—and we have estimated the spillovers that derive from the intensity and diffusion of the platform on the entrepreneurial activity of the surrounding area[1] within the unique empirical setting of Italian Borghi.[2] The combination of this empirical setting and the chosen platform offers a unique opportunity to answer our research question for different reasons. First, Airbnb is widely diffused, and it is thus possible to observe it working in marginal destinations. Indeed, it is not possible to study transportation platforms, such as Uber (as in Burtch et al., 2018) in these settings, since the company only rolls out in urban markets.[3] Second, unlike "traditional platforms" that operate on a pure global de-localized market (Stallkamp & Schotter, 2021), Airbnb offers spatially localized services that can trigger local spillovers that can spread beyond the boundaries of the platform (Barron et al., 2021; Chen et al., 2022; Garcia-Lopez et al., 2020). Third, Airbnb qualifies as a candidate External Enabler (Davidsson, 2015), as it can create, that is, attract or aggregate, customers' demands (Parker et al., 2016), or can lower entrepreneurs' entry investments (Kim et al., 2023). Hence, it generates opportunities, according to the idea that opportunities may arise from technological shifts (Kirzner, 1997). Complementarily, Italian Borghi have unique features: they are currently facing the threat of depopulation and declining economic conditions,[4] and they are therefore clear examples of marginal areas with conditions that are averse to entrepreneurship. Moreover, they are characterized by the presence of a large idle capacity (i.e., unoccupied dwellings) which, combined with the scope of Airbnb, easily enables its local diffusion. Considering this empirical setting, it is important to note that we have studied whether Airbnb spurs significant effects on the entrepreneurs who run small/lifestyle businesses, such as food and entertainment services (Alekseev et al., 2022), outside the platform.[5]

We conducted our empirical analyses on a panel database that united yearly Borgo-level information (from 2009 to 2019) with multiple data sources on the entrepreneurial activity of Borghi, and we merged it with the respective yearly operations of Airbnb. According to the nature of our setting, where we observed a staggered entry of Airbnb[6] across different subsets of Borghi at different points in time, we exploited the recent Callaway and Sant'Anna (2021) estimator to identify the effects of Airbnb's entry on local entrepreneurship. In a nutshell, we find that those Borghi that had witnessed the entry of Airbnb experienced a positive and significant increase in their entrepreneurial activities (+5.9% to 6.3% of the total income from entrepreneurial activity and +3.5% to 3.6% per capita income from entrepreneurial activity). Furthermore, in line with the aim of the study, we find that these effects are heterogeneous, as they are mainly present in *low-income* Borghi (i.e., the subset of Borghi with particularly unfavorable economic conditions) and typically affect entrepreneurs in segments that are close to the key operations of Airbnb (i.e., transportation, hospitality, and entertainment). Finally, through a complementary multimodal analysis (Shrestha & He, 2022), we also explored the mechanisms through which Airbnb creates these effects and found,

among others: "wider visibility"—that is, demand creation—online and offline word-of-mouth and, in specific cases, scope sharing between the entrepreneurial act and the platform business.

This article makes three notable contributions. First, we add to the literature that investigates the effects of digital platforms on the creation of entrepreneurial opportunities (Davidsson, 2015; Foss & Klein, 2020; Gartner, 1988; Shane, 2000; Shane & Venkataraman, 2000; von Briel et al., 2018) and empirically point out that in specific situations—that is, marginal areas—the platform acts as an External Enabler (Davidsson, 2015) as it triggers novel opportunities. We also discuss and test the mechanisms through which this happens, and we indicate the presence of (i) demand-side effects (e.g., demand creation and global exposure as a result of shifting from the global marketplace of the platform to a local area), (ii) supply-side effects (e.g., reduction of entry and operating costs) and, at the intersection of the two, (iii) scope-sharing, as we show that, rather than only creating new spaces for entrepreneurs, platforms can also shape entirely new business ecosystems around their core activities. Second, we augment the literature on platform-enabled entrepreneurship (Srinivasan & Venkatraman, 2018) by showing that specific opportunities may arise for entrepreneurs *outside* the boundaries of the platform rather than opportunities for complementors active on the digital platform (Srinivasan & Venkatraman, 2018). Third, we provide specific policy implications. We, in fact, show how policymakers can indirectly incentivize entrepreneurship in marginal areas, thus suggesting that an endogenous way of favoring entrepreneurial activities in such areas is that of embracing the entry of digital platforms.

2 | LITERATURE REVIEW

This study merges two strands of literature, that is, (i) the literature that focuses on the relationship between digital platforms and entrepreneurial opportunities (Burtch et al., 2018; Davidsson, 2015; von Briel et al., 2018), and (ii) the literature that pertains to the investigation of the externalities generated by the diffusion of digital home-sharing platforms (Barron et al., 2021; Basuroy et al., 2020; Chen et al., 2022; Garcia-Lopez et al., 2020).

In this vein, this section first discusses the state of the art regarding why and how digital platforms can affect entrepreneurial activities and then discusses the externalities of the diffusion of home-sharing platforms to provide a baseline for our analyses.

2.1 | Digital platforms as enablers or deterrents of entrepreneurial opportunities

The extant literature identifies different mechanisms through which digital platforms can affect entrepreneurs' acts and depicts them as either facilitators (Agrawal et al., 2018; Davidsson, 2015; Kim et al., 2023; von Briel et al., 2018) or deterrents (Acs & Armington, 2006; Burtch et al., 2018).

The literature on entrepreneurial opportunities (Alvarez et al., 2013; Davidsson, 2015; Dutta & Crossan, 2005; Gartner, 1988; Shane, 2000; Shane & Venkataraman, 2000; Srinivasan & Venkatraman, 2018) provides suitable argumentations to derive theoretical explanations on whether the entry of a digital platform (in marginal areas) stimulates entrepreneurs to start new activities. Grounding on the definition of opportunities provided by Casson (1982)—according to which "new goods or services can be introduced and sold at a greater cost than their cost of production"—we contend that the diffusion of digital platforms, which allows for a more efficient and cost-effective deployment and acquisition of resources and customers (Kim et al., 2023; Kretschmer et al., 2022), can positively affect entrepreneurs' activities, on condition that new services can be introduced with lower entry barriers. Accordingly, the External Enabler theoretical framework put forward by Davidsson (2015) provides an appropriate theoretical argumentation in this context. Indeed, since an External Enabler is "an external circumstance which – by affecting supply, demand, costs, prices or payoff structures – can play an essential role in eliciting and/or enabling a variety of venture development attempts by several actors" (Davidsson, 2015, p. 684), the entry of a digital platform can

constitute an enabler that acts through both supply side mechanisms (e.g., lowering resource acquisition costs and entry barriers in general, Kim et al., 2023) and demand side ones (e.g., broadening the audience and the possible demand; Gawer & Cusumano, 2002; Parker et al., 2016). These theoretical arguments claim that digital platforms play a relevant role in determining the opportunity creation processes, as pointed out by von Briel et al. (2018) and by Srinivasan and Venkatraman (2018), who first mentioned the concept of "platform-enabled" entrepreneurship.

The contributions of Agrawal et al. (2018) and Kim et al. (2023) support the theoretical testbed of the External Enablement concept (Davidsson, 2015), or more generally, the positive spillover effects of the diffusion of digital platforms on contextual entrepreneurial activities. Agrawal et al. (2018) mentioned a supply-side mechanism, as they found that the roll-out of digital service providers enhances entrepreneurial activities since prospective entrepreneurs can strategically reallocate slack resources—such as time. Kim et al. (2023) depicted two main mechanisms, one on the supply side and one on the demand side, and they found that the diffusion of Craigslist in US cities stimulated entrepreneurial activities by reducing resources and customers' acquisition costs.

Other empirical studies have proposed a different perspective. Some have, indeed, indicated platforms as deterrents to entrepreneurship, therefore pointing out negative effects that are different from the theorized positive ones. Burtch et al. (2018) examined the effects of Uber's entry on the entrepreneurial activities in the main cities of the USA and showed that a decrease in entrepreneurial activities, which were mainly concentrated in low-quality segments, was caused by the roll-out of Uber in the city. According to Burtch et al. (2018), this can be explained by considering that the diffusion of gig-economy (digital) platforms increases the opportunity costs faced by prospective entrepreneurs as it offers a viable and remunerable activity (Acs & Armington, 2006; Block & Koellinger, 2009). According to Block & Koellinger (2009), such an effect is felt more by underemployed people (Burtch et al., 2018).

2.2 | The role and externalities of home-sharing platforms

Digital home-sharing platforms, and Airbnb in particular (Guttentag, 2015), have been studied extensively by researchers in the last few years, given the relevant externalities that they have generated within and beyond the touristic sector. However, although Airbnb has been recognized as a valid testbed for prospective entrepreneurs (Davidsson, 2022; Dogru, Mody, et al., 2020; McBride & Wuebker, 2022), most of the conducted research has placed emphasis on the negative effects that arise from its diffusion.

Two main bodies of research have emerged, one that has focused on the disrupting effects of Airbnb on traditional service providers (Farronato & Fradkin, 2022; Li & Srinivasan, 2019; Zervas et al., 2017), and another that has focused on the externalities of Airbnb diffusion within cities (Barron et al., 2021; Chen et al., 2022; Garcia-Lopez et al., 2020). Zervas et al. (2017) and Farronato and Fradkin (2022) have shown different perspectives. The former pointed out home-sharing services and incumbents (hotels) as substitutes, and they estimated negative effects on hotel revenues as a result of the local penetration of Airbnb. Farronato and Fradkin (2022) instead showed that Airbnb and hotels can act as complementors, especially in periods when touristic peaks are likely to be reached. Moreover, they indicated that the flexible supply offered by Airbnb leads to a decrease in prices and, consequently, to an increase in the welfare of the consumers. On the other hand, a growing body of literature on the effects of the diffusion of home-sharing on residents has consistently shown that Airbnb produces negative externalities in cities. Garcia-Lopez et al. (2020) Barron et al. (2021) and Chen et al. (2022) confirmed the positive causal effect of the penetration of home-sharing on the rental/purchase sales of housing, which is mainly caused by a decline in the long-term rental supply because of the owners switching to the short-term rental market (Chen et al., 2022). In the same manner, the literature on urban geography has recognized these effects in the city context and highlighted how Airbnb is enhancing the displacement processes of residents (i.e., gentrification) (Wachsmuth & Weisler, 2018).

Hidalgo et al. (2023) and Basuroy et al. (2020) focused on the effects of Airbnb diffusion on contextual business activities, mainly restaurants, an aspect that is closely connected to our paper. By analyzing the causal nexus between Airbnb penetration in specific neighborhoods and the supply and revenues of restaurants (in Madrid and

Texas, respectively), they showed that Airbnb diffusion expands the demand for amenities in areas where the local penetration of the platform increases. This translates into either the growth of restaurant revenues, or new opportunities for prospective entrants in the sector, that is, the opening of new restaurants in the corresponding neighborhood (Basuroy et al., 2020; Hidalgo et al., 2023). However, although these findings depict positive spillovers for a subset of entrepreneurs, they also point out that Airbnb is a major cause of the touristification phenomena (Cheung & Yiu, 2022), and thus increases inequality and over-tourism issues (Carrasco-Farré et al., 2022).

These competing positive and negative externalities highlight the complexity of the phenomenon of home-sharing. Even though multiple studies have been conducted, the contexts under analysis were always homogeneous, since the empirical applications mainly focused on urban and economically developed contexts. However, the phenomenon can be more complex, since different effects may emerge across different areas, particularly in the presence of a large idle capacity in the housing market.

3 | EMPIRICAL AND THEORETICAL SETTING: ITALIAN BORGHI AND THE EFFECTS OF AIRBNB

3.1 | Empirical setting: Italian Borghi

Our analysis is confined to a specific context, that is, Italian Borghi. According to the Italian Ministry of Culture, a Borgo is defined as "a small town, or an aggregation of small municipalities, with a small population in which a historical borgo should be clearly identifiable and visible. In the case of very small Borghi, the historical part can constitute the whole municipality."

In line with this definition, Italian Borghi are small towns (a Borgo has an average surface area of about 51 km^2) with few inhabitants (on average, fewer than 4000 inhabitants per Borgo), and are typically located within rural areas (in 77% of the cases, i.e., areas with a very low population density) or in areas with an intermediate population density (in 23% of the cases).[7] Appendix A1 in Supporting Information shows the distribution of the Borghi throughout the entire Italian territory together with descriptive evidence on their sizes and populations. Italian Borghi hosts small business and lifestyle entrepreneurs, as almost all the enterprises active within a Borgo have the legal form of simple associations or partnerships. The main businesses carried out in these areas are mainly related to the potential—as yet not fully exploited—touristic vocation, such as food services, primary sector activities (e.g., agriculture or fishing), trade, and transportation.

The unique combination of the characteristics of the Borghi and the digital platform chosen for the analyses (i.e., Airbnb) makes our empirical setting rather relevant to answer our research question. First, Italian Borghi clearly represents the concept of a "marginal" area.[8] Indeed, despite the relevant touristic potential[9] embodied in their unique historical amenities (e.g., the historical centers, museums) or attractive natural locations, the current and prospective socio-economic landscape of Italian Borghi is not flourishing (they witnessed a −9% decline of the young population, compared to urban centers, from 2009 to 2019, and a −20% trend in the local income in the same time window). Although this decline can be attributed to a multitude of general causes, such as increasing urbanization trends and declining employment in agriculture, as opposed to the pauperization of marginal areas, many of the declining economic conditions of Borghi are due to supply-side inefficiencies, because, for instance, the traditional hospitality offering, which can serve as a stimulus for the local economy, is not sufficient to attract an adequate number of visitors (on average, a Borgo has 0.08 hotel beds per inhabitant). This inefficiency, combined with the geographical remoteness of Borghi, makes these areas economically marginal: they have touristic potential, but (international) tourists are either unaware of them or are not able to reserve a stay due to a lack of accommodation capacity.

Second, and coherently with the previous point, the entrepreneurial activity within the Borghi is stagnant, because of the presence of high entry and exit barriers (Lofstrom et al., 2014). The entry process of local

entrepreneurs requires high costs to overcome both structural barriers (e.g., the acquisition of the resources necessary to be productive and competitive on the market), and strategic barriers (e.g., the costs necessary to attract enough customers to locations that have scarce visibility—for instance through advertising—to make the business sustainable over the long-term) (Bain, 1956). Compared to other settings, where the cost of starting a new business is still present (e.g., in urban areas, where entrepreneurs need to invest in resources and customers' acquisition), Italian Borghi presents a more complex condition, since the entry barriers are significantly larger due to the presence of constraints on both the demand side (e.g., the need to create market demand, rather than capturing it) and on the supply side (e.g., obstacles to the renovation of the local real-estate heritage, difficulty in procurement activities, difficulty in obtaining financial support). Complementarily, the potential "sunk" nature of the required entry investments (which are difficult to recover for businesses that are not successful) raises the exit barriers, thereby delaying the decision of pursuing entrepreneurial opportunities (Dixit, 1989), or, generally, increasing its risk.[10]

Finally, the nature of Borghi combines with the core business of Airbnb for two main reasons. First, there is a large idle capacity (Frenken & Schor, 2017), which can be exploited by the platform (i.e., Airbnb) to pave the way toward its local diffusion. On average, there are three available dwellings per household in a Borgo, which means that there are several residential dwellings that are not utilized by the residents and that could easily be used for short-term rentals. Second, the intrinsic—and yet unexplored—touristic potential of Borghi is in line with the capabilities and scope of Airbnb.[11]

3.2 | Theoretical background: How Airbnb affects entrepreneurship in Italian Borghi

Various features make Airbnb a suitable candidate platform to trigger local entrepreneurial dynamics. Compared to "traditional platforms" (e.g., search engines, e-commerce platforms, or social media), platforms like Airbnb or Uber have, in fact, certain distinct characteristics. In "traditional platforms" supply and demand are matched on a single de-localized and fictitious marketplace, without any geographical border (Kim et al., 2022; Stallkamp & Schotter, 2021), while Airbnb, although still matching supply and demand on a digital marketplace, offers "spatially localized" services that are consumed on a clearly physical and geographically segmented market. According to the scientific literature, these platforms are characterized by local network effects, as they operate on both international and local, regional, networks (Stallkamp & Schotter, 2021). This close interconnection between the digital and the local levels, where the business of the platform actually operates (which is also present on other platforms that offer *spatially localized services*, such as Uber), is, therefore, the reason why spillover effects—on entrepreneurship or on other socioeconomic processes, as shown in Section 2.2—are expected to spread across the surrounding area in which the platform is diffusing.

Accordingly, the External Enabler framework (Davidsson, 2015) proposes a valid theoretical baseline to help understand how, and through what channels, Airbnb can affect entrepreneurial opportunities in Borghi. Compared to economically favorable markets, where the entry of a platform can increase the opportunity costs to pursue entrepreneurial activities (Burtch et al., 2018), the entry of Airbnb into Borghi can influence entrepreneurs' decisions by acting through demand-side and supply-side mechanisms.

On the demand side, Airbnb can act in multiple ways. Given the flexible nature of the short-term accommodation capacity (Farronato & Fradkin, 2022), Airbnb provides Borgo with an easy way of extending its accommodation capacity by taking advantage of the ample idle capacity of the residential supply. Hence, as the Borgo is sponsored on Airbnb, the platform, by exploiting the benefits of network effects (Parker et al., 2016), creates a novel demand (i.e., which did not exist before) for local businesses as it shifts the exposure of the Borgo from a local to a global audience by integrating its local and global network effects (Stallkamp & Schotter, 2021).[12] In this sense, while in the urban settings of Hidalgo et al. (2023) or Basuroy et al. (2020) Airbnb may primarily relocate and concentrate an existing city-level demand in specific neighborhoods (and, eventually, generate new demand), in the case of Borghi Airbnb needs to create from scratch "novel" demand where it did not exist before.

On the supply side, Airbnb can affect entrepreneurial activity through *conservation* and *compression* mechanisms a-là von Briel et al. (2018). According to Kim et al. (2023), Airbnb can reduce the resources that are required to start and run a local business, since the platform can directly perform specific activities, thereby lowering the investment costs required by entrepreneurs (i.e., the *conservation* concept of von Briel et al., 2018). For instance, entrepreneurs can lower the resources necessary for promotion and customer acquisition (Kim et al., 2023), since the platform sponsors the location and the services offered by local entrepreneurs either at a digital level (i.e., the destination appears in an Airbnb search ranking, and customers' reviews specifically mention and recommend local businesses) or at a physical one (e.g., social interaction and word-of-mouth between hosts and guests; Farmaki & Stergiou, 2019). On the other hand, Airbnb can also allow specific entrepreneurs with complementary resources to integrate their business activities with those performed by the platform, thereby lowering their costs through resource-sharing mechanisms. Coherently, by lowering and absorbing a part of the setup costs, hence limiting the risk associated with the initial "sunk" investments, Airbnb reduces the time-to-market of entrepreneurial activities (i.e., the *compression* concept à la von Briel et al., 2018).

We also argue that, at the intersection between demand and supply-side mechanisms, Airbnb is capable of aligning the scope of local entrepreneurial activities around its core business (i.e., in other words, it is able to translate the potential touristic vocation of a Borgo into a real touristic specialization). This mechanism is relevant because it creates convergence between platform customers and local business customers on the demand side, while it diminishes the specificity and the risks associated with the non-recoverability of entry investments on the supply side.[13]

4 | DATA AND METHODOLOGY

This section presents the data we used in the analyses, as well as information on both methodologies we employed to estimate the causal effects of Airbnb entry and diffusion on entrepreneurial activities within Italian Borghi.

4.1 | Data description

We based our analysis on a database that we had built by merging information from different sources. The data were organized in a panel structure to contain yearly information, from 2009 to 2019, on 270 Italian Borghi (those "officially" recognized by the "I Borghi più Belli d'Italia" association https://borghipiubelliditalia.it/borghi/, a definition that is compatible with the definition of the Italian Ministry of Culture). The following variables, from each specific data source, were measured for each Borgo.

4.1.1 | Airbnb data

We counted the number of active Airbnb's, gathered from AirDNA (https://www.airdna.co), in a Borgo for each year from 2009 to 2019,[14] so that we were then able to identify the Borghi that had experienced the diffusion of the platform (i.e., those registering at least one Airbnb) and the time at which the diffusion of the platform started within the Borgo (i.e., the year in which the first Airbnb opened in a given Borgo), namely the "entry" of Airbnb.

4.1.2 | Entrepreneurial activity data

We retrieved information about the entrepreneurial activity of each Borgo, which we considered as representative of the local entrepreneurial opportunities. We gathered this information from two alternative sources. First, in line

with Burtch et al. (2018), we used data from official income declarations (from the Italian Ministry of Finance) as an approximation of the entrepreneurial activity of a Borgo for a given year, thus measuring the total Borgo-level income (INCOME) and the per capita income (INCOMEpc)[15] generated by the entrepreneurial activity. We used the total income from the entrepreneurial activity of a Borgo to gain insights into the "quantity" of entrepreneurs who perceived the opportunities that could be derived from the diffusion of Airbnb, while we used the per capita income to gain insights into the entrepreneurs' unit income.[16] Then, to expand our analysis, we leveraged sector level data taken from Unioncamere[17] by gathering the number of active firms in a given Borgo in a specific year for each industrial sector (namely, the first letter of the Italian ATECO classification; see https://codiceateco.it). We analyzed the following industrial sectors: the primary sector (PR) (i.e., agriculture, fishing), the secondary sector (MFCG) (i.e., manufacturing, which, in the case of Italian Borghi, is mainly configured as artisanship), trade (TRD), transportation (TRSP), hospitality (HSP) (i.e., restaurants and traditional accommodation), financial services (FIN), real estate (RE), travel agencies and service supporting firms (TA-SUP), and entertainment (ENT). We chose these industrial sectors because they represent most of the sectors that could be active in such a market as a Borgo. As reported in Table A2.1 in Supporting Information, these sectors on average account for about 80% of the active firms within a Borgo, with the mean values being no different between the Borghi that witnessed the entry of Airbnb and those that did not. For the sake of completeness, Table A2.2 in Supporting Information reports the sub-sectors that work within each of the analyzed industries, and details the kind of specific activities that are likely to be undertaken in each case.[18]

4.1.3 | Additional (control) data

We gathered different controls and additional variables from multiple public sources. We sourced the main socioeconomic variables from the official Italian Center for Statistics, ISTAT (https://www.istat.it). These variables included: (i) the number of hotel beds (HOTELBEDS), (ii) the number of unoccupied residential dwellings, according to the National Census of 2011 (DWELL), all of which were considered at the Borgo level, and, finally, (iii) other sociodemographic indicators (e.g., population and share of working individuals at the Borgo level and the provincial GDP). Such variables were considered relevant since they are indicators of the socioeconomic and touristic status of each Borgo. Finally, we sourced information on the long-term rentals and transaction values for both business and housing amenities from the Real Estate Market Observatory (https://www.agenziaentrate.gov.it).

Our dataset stopped in 2019, since we decided to exclude 2020 from the analyses (even though data from the income declarations and from Unioncamere were already available) because the aim of our analysis had been to estimate the impact of platform entry on the local entrepreneurial opportunities in a standard economic situation, and the shock caused by the Pandemic-19 outbreak would have invalidated our theoretical/empirical testbed. However, a study of the post-COVID tourist industry could generate important additional evidence, given the increasing importance of marginal destinations as relevant assets for the Italian tourism industry.

4.2 | Methodology

The aim of our analyses is to test whether the entry and the subsequent diffusion of Airbnb in Borgo fostered local entrepreneurial activities. We tested, and quantified, such effects in two (complementary) ways, namely referring to "extensive" and "intensive" margins. The former effect, that is, "extensive" margin, refers to the fact that once the first Airbnb is opened within a Borgo, which we call "entry," the Borgo becomes visible on the Airbnb platform, and it is thus exposed to the whole online community (regardless of the number of Airbnbs). This effect is partially related to the scale of diffusion, and it refers to the differences between the Borghi that witnessed the diffusion of Airbnb and the Borghi that did not. Such an "extensive" margin is capable of influencing entrepreneurs' decisions, since local

activities can, in fact, benefit from the wide market exposure provided by the presence of a Borgo on the platform (Parker et al., 2016). Complementarily, the latter effect, that is, the "intensive" margin, refers to the fact that we can expect larger effects where the penetration of Airbnb is stronger, namely, where the number of Airbnb is higher, relative to the size of the Borgo. We expected this effect to hold because the larger the presence of Airbnb is, the greater (i) the additional accommodation capacity and (ii) the probability of having touchpoints between hosts—experts of the local market—and guests (Farmaki & Stergiou, 2019), which, in turn, can sponsor local entrepreneurial activities.

To quantify the presence of both effects, we designed our analyses using two alternative estimation methods, namely (i) a staggered difference-in-difference (DID) design (Callaway & Sant'Anna, 2021)—to validate the "extensive" margin, and (ii) a continuous treatment approach (Callaway & Sant'Anna, 2021)—to test the "intensive" margin.

4.2.1 | DID with a staggered treatment design

To test the causal effect of Airbnb entry on local entrepreneurial activities, we first designed our empirical approach as a quasi-natural experiment, since we wanted to exploit the fact that Airbnb enters into different subsamples of Borghi at different points in time, and not all of the analyzed Borghi experienced the entry of the short-term rental platform during the sample period we considered.[19] The share of Airbnb entries into the 270 Italian Borghi for the considered period is shown in Table 1. Overall, 71 Italian Borghi (26.30%) had never witnessed the diffusion of Airbnb during the considered timespan. The majority of the Borghi that had experienced the diffusion of Airbnb had done so between 2011 and 2013 (about 56% of the total).

Compared to the standard DID setting, where treated units are treated simultaneously at a unique point in time, we configured our analysis as a staggered treatment design (Callaway & Sant'Anna, 2021), since the treated units were treated at different points in time. As pointed out by the recent advancements in the econometric literature on DID methods (Roth et al., 2023), standard econometric models could result in erroneous estimates in this design, because of the problem of negative weights (Goodman-Bacon, 2021; Roth et al., 2023).[20] We employed the Callaway and Sant'Anna (2021) estimator to deal with these problems. This estimator provides two

TABLE 1 The "entry" of Airbnb into Italian Borghi per year.

Entry year	# Borghi	% Borghi
n.a.	71	26.30%
2009	2	0.74%
2010	19	7.04%
2011	48	17.78%
2012	55	20.37%
2013	48	17.78%
2014	21	7.78%
2015	6	2.22%
2016	0	0.00%
2017	0	0.00%
2018	0	0.00%
2019	0	0.00%
TOTAL	270	100.00%

Note: The entry assignment refers to when the first Airbnb in a given Borgo subscribed to the platform.

advantages that are particularly suitable for our empirical setting: (i) first, it provides correct estimates of the average treatment effect of a staggered treatment, thereby avoiding the issue of negative weights; (ii) second, it allows the empirical model to specify what control group (never-treated or not-yet-treated Borghi) is being used in the analyses.

We followed the practical suggestions of Roth et al. (2023) for the parallel trend assumption, that is, we imposed a "conditional" parallel trend assumption. Indeed, it is unlikely that Airbnb randomly enters Borghi, thus issuing problems on the validity of the parallel trend assumption in our setting. According to Roth et al. (2023), we assumed that the parallel trends in our empirical setting held true, yet conditional on covariates, X_i.[21] That is, we assumed that Airbnb randomly enters Borghi, conditional on the observed covariates, X_i. We used two exogenously defined covariates to apply such conditions to parallel trends, namely, the stock of residential dwellings in each Borgo before the diffusion of Airbnb ($DWELL_i$)[22] and the number of hotel beds in a Borgo before the diffusion of Airbnb ($HOTELBEDS_i$). We decided to use $DWELL_i$ from the work of Czernich et al. (2011) on broadband diffusion, since we assumed that Airbnb diffusion (the innovation) was likely to take place based on the local residential real estate heritage. In other words, in line with Chen et al. (2022), we argue that the diffusion of Airbnb supply takes place because of the existing (long-term rental or empty) units switching to the short-term rental market. Consistently, assuming that it is difficult to expand the housing supply in the context of Borghi, $DWELL_i$ discriminates Borghi with lower entry barriers to Airbnb from Borghi with higher ones. Similarly, assuming that the traditional hospitality supply is correlated with the touristic demand, we used the number of hotel beds in Borghi in 2009 (before the diffusion of Airbnb) to discriminate Borghi with a high and developed tourist potential from those with a low one. As proposed by Roth et al. (2023) and Callaway and Sant'Anna (2021), we used a doubly robust estimator which merges inverse probability weighting and regression adjustment to implement such conditions on the parallel trend assumption (Roth et al., 2023). The $DWELL_i$ and $HOTELBEDS_i$ variables were both log-transformed. To confirm their relevant explanatory power, Appendix A4 in Supporting Information shows the auxiliary logistic regression that was used to estimate the probability of a Borgo being treated according to these variables: both are strongly significant. Appendix A5 in Supporting Information provides several descriptive statistics following the propensity score matching procedure. Furthermore, we also adopted an event study approach in a second analysis to validate the presence of parallel trends, and we checked that the average treatment effect, before allocation of the treatment, was not statistically significant (Roth et al., 2023).

DID with the staggered treatment design:

$$Y_{i,t} = \alpha + \beta \text{Airbnb}_{i,t} + X_i + \mu + \tau + \varepsilon_{i,t}. \quad (1)$$

Based on the description of the estimator we implemented, we obtained the average treatment effect (ATE), identified by β, of Airbnb entry into local entrepreneurial opportunities by estimating Equation (1). As described above, the dependent variables ($Y_{i,t}$) are proxies of entrepreneurial opportunities, namely (i) the Total Income from Entrepreneurial Activity, $INCOME_{i,t}$, (ii) the Per Capita Income from Entrepreneurial Activity, $INCOMEpc_{i,t}$, and (iii) the number of active firms by industrial sector, in a Borgo i in year t. We used the first metric to provide insights into the "quantity" of the entrepreneurs who had perceived the opportunities that could be generated from the platform, while we used the second metric to gather insights into the growth of the entrepreneurs' unit income. We instead used the third metric to depict heterogeneous effects across industries[23]. All the variables were log-transformed, although we also resorted to Poisson models as robustness checks for count outcomes (i.e., the number of active firms). The main explanatory variable of interest was $Airbnb_{i,t}$, that is, the treatment indicator, a dummy variable that takes on the value of one when Airbnb entered a Borgo, and zero otherwise (where *entry* was defined as the opening of the first Airbnb[24]). μ and τ refer to the Borgo and year fixed effects, respectively.[25]

4.2.2 | The continuous treatment approach

We evaluated the elasticity of the entrepreneurial activity to the local diffusion of Airbnb in the second step of the analysis, taking advantage of the heterogeneous penetration of Airbnb within a Borgo, thereby estimating the "intensive" margin. To do so, we estimated Equation (2), which has the form of a continuous treatment (like that of Basuroy et al., 2020).

The continuous treatment approach:

$$Y_{i,t} = \alpha + \beta \text{AirbnbPenetration}_{i,t} + X_{i,t} + \mu_i + \tau_t + \varepsilon_{i,t}. \quad (2)$$

The dependent variable, $Y_{i,t}$, in the same way as for the case of Staggered DID, is a metric of entrepreneurial activity, namely $\text{INCOME}_{i,t}$, and $\text{INCOMEpc}_{i,t}$, both of which are log-transformed. The main explanatory variable, that is, the continuous treatment, is $\text{AirbnbPenetration}_{i,t}$, which is defined as the ratio of active Airbnbs in a given Borgo *i*, at year *t* per unit of surface, and it is log-transformed. We defined the listings whose *entry* year was lower than or equal to the corresponding year, *t*, and whose *exit* year was greater than *t*, as active listings in a given year, *t*.

Again, the key identification assumption is the fulfillment of the parallel trend assumption (Roth et al., 2023). In line with the literature that employs continuous treatment strategies for similar empirical settings (see Basuroy et al., 2020), we propose the following specification. First, we included the Borgo-specific fixed effects (μ_i) to control for any time-invariant difference across the Borghi and time-fixed effects (τ_t) to control for any unobserved macroeconomic shocks that were common to all the Borghi. Second, we included a rich set of control variables, $X_{i,t}$, to control for any change in the local economic environment that could affect both Airbnb and the entrepreneurial activities: the long-term rentals of business-related facilities, the log of population density, the share of "working" (15- to 64-year-old) individuals, and the provincial GDP (Dogru, Zhang, et al., 2020). Finally, as is often done in such analyses, we also allowed each Borgo to have a specific linear trend.

To improve the estimation of Equation (2), we also used an Instrumental Variable (IV) to instrument the endogenous variable $\text{AirbnbPenetration}_{i,t}$ (continuous treatment). The main idea behind the IV we proposed is that each Borgo is differently exposed to Airbnb penetration, with the exposure varying both cross-sectionally and across time (Bartik, 1993).

We implemented our IV to be in line with the main empirical literature that has employed Bartik-like instruments (Bartik, 1993) on Airbnb-related topics. Thus, among others, we followed Garcia-Lopez et al. (2020) and Barron et al. (2021), who applied this differential exposure design approach to study the impact of Airbnb penetration on long-term rentals. Our IV is composed of the product of two terms, one that varies across the Borghi (called *share* component) and the other that varies in time (*shift* component). First, in line with the main theories on new product diffusion (Bass, 1969), we argue that Borgo is differently exposed to the entry of Airbnb as the popularity of the platform increases. In this sense, we contend that there is an information effect that varies across time and is likely to influence the diffusion of Airbnb. In line with Garcia-Lopez et al. (2020) and Barron et al. (2021), we proxied the shift term using the nationwide queries on Google for "Airbnb" (namely, the GQ_t variable, Google search Queries, as in Equation 3). Second, we argue that a Borgo is more exposed to the diffusion of Airbnb as the presence of residential amenities increases since an increasing number of residential dwellings is likely to increase a prospective host's incentive to join the platform by decreasing its entry barriers. As discussed in Section 4.2.1, we borrowed this intuition from Czernich et al. (2011) and Chen et al. (2022), as we assumed that the diffusion of Airbnb takes place based on the local real estate heritage. We therefore operationalized the share component as the total number of residential dwellings in a Borgo per unit of surface (namely, the DWS_i variable, as in Equation 3). Unlike Barron et al. (2021) and Garcia-Lopez et al. (2020), but like Hidalgo et al. (2023), we used a supply driver rather than a demand one to build the share component of our instrument. Indeed, using proxies of touristic demand (e.g., the number of touristic spots) to instrument Airbnb diffusion would, in this case, result in being endogenous, as they are correlated with the presence of small businesses (Hidalgo et al., 2023). Conversely, the use of a supply driver, such as the stock of

residential' dwellings (not those used for business purposes), justifies the validity of our share component in this setting. Our instrument ($IV_{i,t}$) is thus composed of the product of GQ_t multiplied by the log of DWS_i, as expressed in Equation (3). The IV functions as follows: DWS_i predicts where Airbnb will appear, while GQ_t predicts when (Barron et al., 2021; Garcia-Lopez et al., 2020; Hidalgo et al., 2023).

Definition of the IV for the continuous treatment approach:

$$IV_{i,t} = GQ_t \times \ln DWS_i. \quad (3)$$

We incorporated the IV within the continuous treatment approach using a Control Function method (Florens et al., 2008; Wooldridge, 2015). Accordingly, we first conducted a panel Two-Way Fixed Effects (TWFE) regression of $AirbnbPenetration_{i,t}$ on all the control variables, fixed effects, Borgo-specific trends, and on our IV (as defined in Equation 3). Second, we computed the residuals and included them in Equation (2) as additional regressors.

5 | RESULTS

This section describes the results of our analyses. We first show the average effect by depicting both the "extensive" and "intensive" margins (Section 5.1). We then examine the mechanisms behind the average effect by providing the results of a heterogeneity analysis, considering the local characteristics of the Borgo (Section 5.2) and investigating the industrial sectors affected by Airbnb entry (Section 5.3).

Table 2 provides the descriptive statistics of all the variables employed in the econometric models, together with a synthetic definition.

5.1 | The "extensive" and "intensive" margin analysis

5.1.1 | The "extensive" margin

Table 3 shows the results of the staggered DID approach used to estimate the Average Treatment Effect of Airbnb entry into a Borgo on the entrepreneurial activity, as proxied by two dependent variables (namely INCOME and INCOMEpc). Models M1 to M7 propose all the possible combinations of conditions on parallel pre-trends. Given the nature of our dependent variables, we also conditioned on its lagged value in the most complete specifications (M6 and M7) to provide our estimates with an extra degree of robustness, as suggested by Roth et al. (2023).

All the models provided consistent results, as they generally showed that Airbnb entry had a positive and significant impact on the local entrepreneurial activities in Borgo.[26] We observed that, following the entry of the platform, the treated Borghi experienced a +5.9% (M7) to +6.3% (M6) increase in the total income declared by entrepreneurs, thereby suggesting a growth in entrepreneurial activity. This effect is significantly different from zero at a 95% confidence level. Similarly, we found that the per capita income of entrepreneurs significantly increased, by 3.5% (M7) to +3.6% (M6), in Borghi where Airbnb entered, thus suggesting a growth not only in the *quantity* of entrepreneurs but also in their unit income.

We also estimated an event study model (Angrist & Pischke, 2008; Callaway & Sant'Anna, 2021; Clarke & Tapia-Schynthe, 2022) to complement the analysis. The results of this model are reported in Figure 1 and Appendix A6 in Supporting Information and are based on the M6 specifications shown in Table 3 (although they were confirmed using M7 specifications and employing not-yet-treated units as the control group). We observed different dynamics, depending on which dependent variable was considered. On the one hand, we found an almost immediate effect of Airbnb's entry on $INCOME_{i,t}$, thereby suggesting that entrepreneurs almost instantaneously perceive the opportunities created by the diffusion of the platform. This is consistent with the idea that the Borgo has been advertised and

TABLE 2 Descriptive statistics.

Variable	Source	Description	Mean	Median	SD	Min	Max
Airbnb variable							
$Airbnb_{i,t}$	AirDNA	Percentage of post-treatment observations in the treated Borghi	0.53	–	–	–	–
AirbnbPenetration	AirDNA	Number of active Airbnb in Borgo *i* at time *t*, per square kilometer	3.09	0.02	39.71	0.00	1144.28
Dependent variables							
INCOME	MEF	Income from the "entrepreneurial activities" [k€]	2366	1530	2451	0.00	14,855
INCOMEpc	MEF	Per capita income from the "entrepreneurial activities" [€]	16,632	16,149	4933	0.00	37,671
PR	UNC	Number of active firms in the primary sector (e.g., agriculture, fishing)	115.19	71.00	126.16	0.00	1155.00
MFCG	UNC	Number of active firms in the manufacturing sector	37.46	21.00	41.80	0.00	285.00
TRD	UNC	Number of active firms in the trade sector	87.43	55.00	95.48	0.00	537.00
TRSP	UNC	Number of active firms in the transportation sector	9.64	5.00	11.50	0.00	67.00
HSP	UNC	Number of active firms in the hospitality sector	32.61	21.00	34.35	0.00	269.00
FIN	UNC	Number of active firms in the financial services sector	5.56	3.00	6.91	0.00	54.00
RE	UNC	Number of active firms in the real estate sector	9.86	4.00	15.21	0.00	95.00
TA-SUP	UNC	Number of active firms in the travel agency and support services sector	7.77	4.00	9.84	0.00	75.00
ENT	UNC	Number of active firms in the entertainment sector	4.21	2.00	5.97	0.00	49.00
Control variables (continuous DID model)							
RENTbus	OMI	Average monthly long-term rental for business purpose facilities [€/month per sqM]	3.71	3.18	2.02	0.00	19.90
GDP	ISTAT	Provincial (NUTS3 to which Borgi belongs) yearly GDP [in M€]	89,255	48,309	84,402	4528	399,339
POPdens	ISTAT	Population density (number of inhabitants per square kilometer)	150.42	71.67	466.75	3.32	7645.11
POPwork	ISTAT	Share of individuals between 15- and 64-years-old	0.71	0.72	0.05	0.53	0.85

Note: The descriptive statistics were computed on the whole dataset.
Source: ISTAT, Italian Office of Statistics; MEF, Italian Ministry of Economy and Finance; OMI, Italian Observatory for the Real Estate Market; UN, Unioncamere.

TABLE 3 The baseline staggered DID approach.

	M1	M2	M3	M4	M5	M6	M7
$Y = \text{INCOME}_{i,t}$							
ATE	0.129 (0.101)	0.062** (0.029)	0.055 (0.039)	0.066* (0.041)	0.054* (0.030)	0.063** (0.030)	0.059** (0.030)
N	2898	2892	2898	2892	2448	2448	2448
Cond: DWELL_i	No	Yes	No	Yes	No	Yes	Yes
Cond: HOTELBEDS_i	No	No	Yes	Yes	No	Yes	Yes
Cond: $Y(i,t-1)$	No	No	No	No	Yes	Yes	Yes
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control group	Never treat	Never treat	Never treat	Never treat	Never treat	Never treat	Not yet
$Y = \text{INCOMEpc}_{i,t}$							
ATE	0.032 (0.020)	0.031** (0.015)	0.024 (0.018)	0.031** (0.015)	0.036** (0.017)	0.036** (0.015)	0.035** (0.014)
N	2898	2892	2892	2892	2448	2448	2448
Cond: DWELL_i	No	Yes	No	Yes	No	Yes	Yes
Cond: HOTELBEDS_i	No	No	Yes	Yes	No	Yes	Yes
Cond: $Y(i,t-1)$	No	No	No	No	Yes	Yes	Yes
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control group	Never treat	Never treat	Never treat	Never treat	Never treat	Never treat	Not yet

Note: "Cond" stands for the condition of the parallel pre-trend assumption, which was implemented through a doubly robust estimator. The dependent and conditional variables were all log-transformed. "Never treat" stands for never-treated units employed as a control group to estimate ATE. "Not yet" implies that not-yet-treated observations were used as the control group to estimate the ATE. ***$p < .01$; **$p < .05$; *$p < .10$. All the models employed Borgo level and year fixed effects, FE. All the models adopted clustered robust standard errors at the Borgo level.

sponsored on Airbnb already from the opening of the first Airbnb. This effect is also persistent (except for $T = +3$ and $T = +8$) and increases over time, reaching a peak of +10.3% 6 years after the treatment.[27] On the other hand, we noted that the per capita income of entrepreneurs was not affected immediately by the entry of Airbnb, as it takes about 4 years to become stable and significantly different from zero, with a peak of +7.01% 6 years after the treatment. The existence of both immediate and delayed effects on the total entrepreneurial activity and the per capita unit income suggests entrepreneurs immediately perceive the opportunities that can be derived from platform entry, although their individual income only increases after some years.

As far as the pretreatment periods are concerned, we found that there was no significant treatment effect of Airbnb entry on entrepreneurial activities for any of the pretreatment years. This result provides evidence that no anticipation effect exists, and it is a visual indication of the fact that our conditions on parallel pretrends have been effective (Roth et al., 2023).

Consistent with the description of the variables, we also believe that the difference in magnitude of the effects on INCOME and INCOMEpc suggests that the growth of the total income declared by the entrepreneurs for Airbnb entry is driven by both increases in the number of entrepreneurs and increases in their unit per capita income.[28]

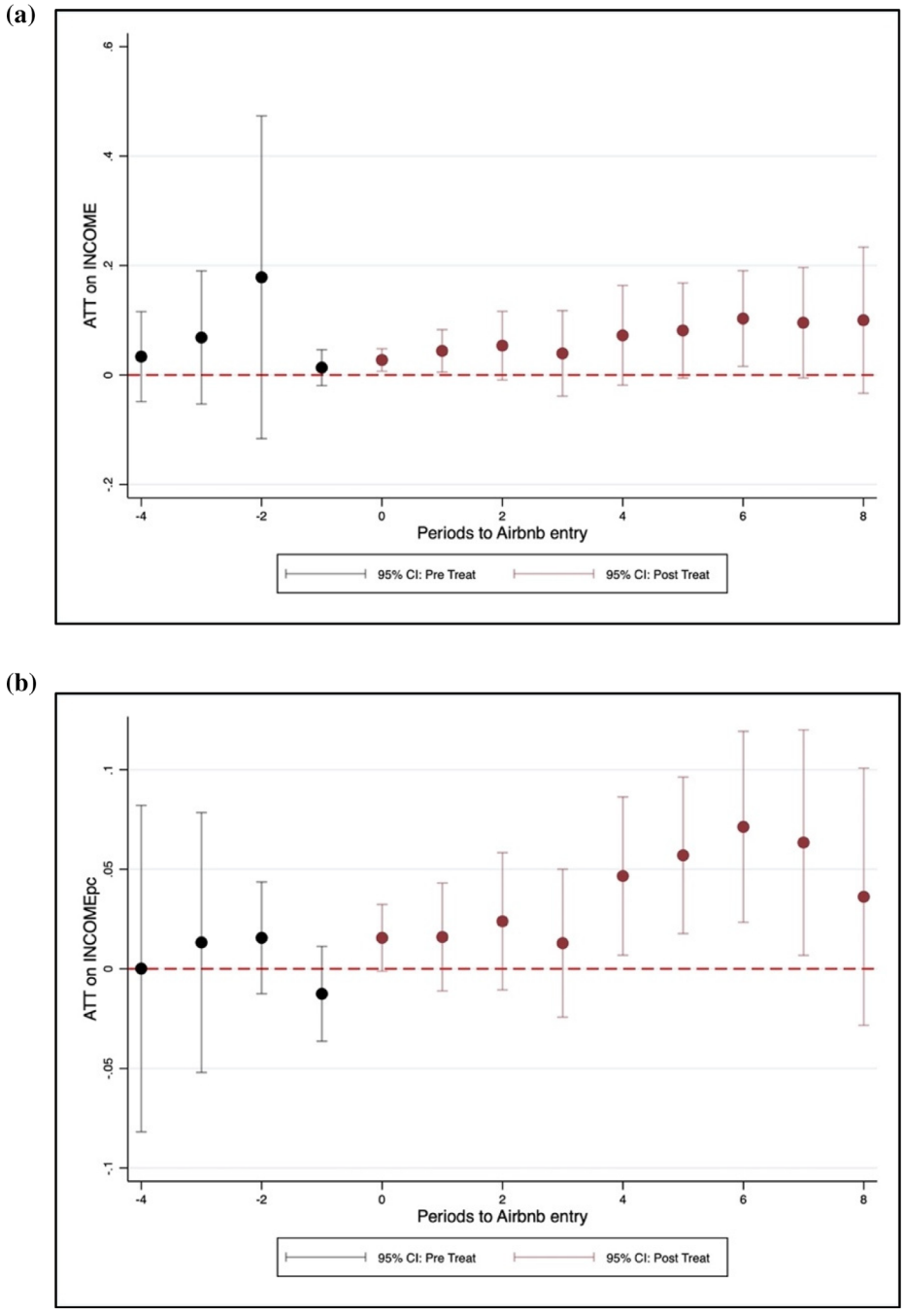

FIGURE 1 Event study plot. (a) Dependent variable = INCOME (Income from Entrepreneurial Activities). (b) Dependent variable = INCOMEpc (Per Capita Income from Entrepreneurial Activities). The coefficients reported in the chart were derived from the table presented in Appendix A6 in Supporting Information. The confidence interval is at a 95% confidence level. The event study was estimated using the Callaway and Sant'Anna (2021) estimator, as reported in Section 4.2.1. Both of the dependent variables were log-transformed; thus, the coefficients should be interpreted as elasticities.

5.1.2 | The "intensive" margin

In this section, we explore the existence of an "intensive" effect by estimating how variations in the penetration of Airbnb influence local entrepreneurial activities (i.e., Equation 2). As reported in Section 4.2.2., we employed a continuous DID approach, where the treatment was represented by the local penetration of Airbnb (Basuroy et al., 2020) within a Borgo. We performed this estimation through two empirical approaches. First, we conducted a panel, two-way, fixed-effects regression, controlling for the socio-demographic variables, and we allowed each Borgo to have a specific linear trend. Second, we augmented this specification by incorporating a 2SLS approach in which Borgo-year Airbnb penetration was instrumented through an exposure-design IV and a Control Function method[29] (Florens et al., 2008; Wooldridge, 2015). Table 4 shows the results of this approach.[30]

Two alternative effects can be observed, with reference to the M4 models (the most demanding and complete specification). On the one hand, a positive and significant effect of Airbnb penetration on the total income declared by entrepreneurs can be observed. We estimated that the total income declared by entrepreneurs increased by 4% for a 10% increase in Airbnb penetration. Conversely, no effect on the per capita income of entrepreneurs can be observed.

We contend that two different effects are likely to be at play in this case, which could explain the difference in the effects on the total and per capita incomes. On the one hand, the growth of the relative size of the penetration of the platform increases the demand for contextual products/services, thus making more entrepreneurs willing to embark on new venture activities to enjoy such a demand shock (Parker et al., 2016). This effect increases the likelihood of the creation of new businesses but also triggers competition among the entrepreneurs, which diminishes individual profits, although the total income increases at the local level. On the other hand, we contend that, consistent with the considered event-study dynamics (i.e., Figure 1), these results envisage—and confirm—the fact that entrepreneurs first enter when Airbnb diffuses and then accumulate resources and prepare their business activities so that some time is necessary before any significant effects on the unit income can be observed.

5.2 | Heterogeneity in the Borghi characteristics

The literature on the determinants of entrepreneurial processes has produced consistent evidence on the fact that entrepreneurial opportunities are shaped by local factors. This is, for instance, the case of the literature on entrepreneurial ecosystems and studies on the relationship between local enablers and the rise of technological startups (Colombelli, 2016; Fritsch & Wyrwick, 2018; Stam, 2015). We contend that such effects are also likely to hold in our case, thereby envisaging that an enabling effect (and the corresponding mechanism) of the digital platform on local entrepreneurial activities may exist—or may not exist—depending on the specific local market characteristics.

To test such arguments, we designed a treatment-heterogeneity analysis, in which we classified each Borgo across two observable characteristics: local individual disposable income, which indicates the level of wealth within a Borgo, and transport accessibility, which indicates whether the Borgo is well-connected with the main transportation hubs. We operationalized such a classification and divided the Borghi into two sub-samples as follows. First, we measured the individual wealth level by considering the values of the per capita declared income in 2009 in each Borgo—since it is reasonable to assume that such values had not yet been influenced by the diffusion of Airbnb (Table 1)—and, to proxy transport accessibility, we computed the distance of each Borgo from the nearest airport. We then divided the 270 Borghi into two groups (comparable in size) according to the median values of the two variables. Consistently, we compared "high Income versus low Income" (i.e., local per capita disposable income above the sample median—€15,229—for high Income Borghi and below for low Income Borghi), and "accessible versus not accessible" (i.e., distance from the nearest airport above the sample median—74.50 km—for non-accessible Borghi and below for accessible Borghi). Table 5 shows the estimation results, which were obtained employing the Callaway and Sant'Anna (2021) estimator, in its most complete specifications (as in Models M6 and M7 shown in Table 3).

TABLE 4 The continuous treatment approach.

	Simple continuous treatment DID				Control function approach			
	M1.1	M1.2	M1.3	M1.4	M2.1	M2.2	M2.3	M2.4
(a) $Y = \text{Income}_{i,t}$								
$\text{AirbnbPenetration}_{i,t}$	−0.038** (0.016)	0.085** (0.039)	0.112** (0.045)	0.085*** (0.029)	−0.216*** (0.051)	0.093 (0.126)	0.717* (0.416)	0.426 (0.264)
Constant	14.085*** (0.005)	14.045*** (0.012)	14.037*** (0.015)	−4.522 (16.081)	14.134*** (0.016)	14.035*** (0.041)	13.833*** (0.134)	−2.945 (14.962)
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes		Yes	Yes	Yes
Borgo linear trend			Yes	Yes			Yes	Yes
X				Yes				Yes
Control function					Yes	Yes	Yes	Yes
N	2937	2937	2937	2791	2920	2920	2920	2777
R^2	0.887	0.893	0.960	0.968	0.890	0.892	0.960	0.968
(b) $Y = \text{INCOMEpc}_{i,t}$								
$\text{AirbnbPenetration}_{i,t}$	0.086*** (0.008)	0.043*** (0.011)	0.017 (0.016)	0.021 (0.016)	0.158*** (0.013)	0.072*** (0.018)	−0.007 (0.062)	0.006 (0.059)
Constant	9.646*** (0.003)	9.660*** (0.003)	9.668*** (0.005)	5.375 (3.746)	9.621*** (0.004)	9.648*** (0.006)	9.674*** (0.020)	5.367 (3.728)
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE		Yes	Yes	Yes		Yes	Yes	Yes
Borgo linear trend			Yes	Yes			Yes	Yes
X				Yes				Yes
Control function					Yes	Yes	Yes	Yes
N	2930	2930	2930	2789	2913	2913	2913	2775
R^2	0.833	0.852	0.907	0.913	0.843	0.852	0.906	0.912

Note: All the estimates used the log of $\text{INCOME}_{i,t}$ as the dependent variable. The main explanatory variable (i.e., Continuous treatment) was the log of $\text{AirbnbPenetration}_{i,t}$. Models M1.1 to M1.4 were based on a standard Continuous Treatment DID with TWFE. Models M2.1 to M2.4 also incorporated a linear control function to consider treatment endogeneity. Control Function = yes indicates that the residuals from the first stage were included in the model as additional regressors. All the models adopted clustered robust standard errors at the Borgo level. ***$p < .01$; **$p < .05$; *$p < .10$. The p-value in Model M2.4 in the Control Function Approach for ATE is equivalent to 0.108.

TABLE 5 Heterogenous effects across the local characteristics of a Borgo.

	Split: PC income 2009		Split: Dist. Airport	
	High income	Low income	Not accessible	Accessible
$Y = \text{INCOME}_{i,t}$				
ATE	0.040 (0.027)	0.087*** (0.028)	0.071 (0.066)	0.064*** (0.024)
N	1357	939	1240	1208
Cond: DWELL_i	Yes	Yes	Yes	Yes
Cond: HOTELBEDS_i	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes
Control group	Never treat	Never treat	Never treat	Never treat
ATE	0.039 (0.026)	0.076*** (0.028)	0.062 (0.064)	0.060** (0.024)
N	1357	939	1240	1208
Cond: DWELL_i	Yes	Yes	Yes	Yes
Cond: HOTELBEDS_i	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes
Control group	Not Yet	Not Yet	Not Yet	Not Yet
$Y = \text{INCOMEpc}_{i,t}$				
ATE	0.022 (0.018)	0.086*** (0.032)	0.029 (0.025)	0.057*** (0.018)
N	1357	939	1240	1208
Cond: DWELL_i	Yes	Yes	Yes	Yes
Cond: HOTELBEDS_i	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes
Control group	Never treat	Never treat	Never treat	Never treat
ATE	0.023 (0.018)	0.079*** (0.031)	0.026 (0.024)	0.056*** (0.017)
N	1357	939	1240	1208
Cond: DWELL_i	Yes	Yes	Yes	Yes
Cond: HOTELBEDS_i	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes
Control group	Not yet	Not yet	Not yet	Not yet

Note: "Cond" stands for the condition of the parallel pretrend assumption, which was implemented through the use of a doubly robust estimator. The dependent and conditional variables were all log-transformed. "Not yet" implies that not-yet-treated observations were used as the control group to estimate the ATE. ***$p < .01$; **$p < .05$; *$p < .10$. The Borghi were split based on the median values of the Per Capita Income in 2009 (15,229 €) and the Distance to the nearest airport (74.5 km). "Dist." stands for distance (from the nearest airport). All the models employed Borgo level- and year-fixed effects (FE). All the models adopted clustered robust standard errors at the Borgo level.

We can see that the heterogeneity of the local Borgo characteristics had a significant impact on the baseline results. As far as the local wealth level is concerned, we found that Airbnb had a significant effect on the entrepreneurial activities of *low income* Borghi (+7.6% to +8.6% for $\text{INCOME}_{i,t}$ and +7.9% to +8.6% for $\text{INCOMEpc}_{i,t}$), while no significant effects are found for the *high income* ones. As far as transport accessibility is concerned, and in line with our prediction, we found that Airbnb entry significantly and positively affected entrepreneurial activities, albeit only in those Borghi that are closer to an airport (+6.0% to +6.4% for $\text{INCOME}_{i,t}$ and around +5.6% for $\text{INCOMEpc}_{i,t}$).

Despite not directly testing the theorized supply- and demand-side mechanisms, these results support our theoretical background. The significant effects on "low income" Borghi reinforces the idea of Airbnb being an external enabler in marginal areas and relates to the presence of supply-side determinants. Indeed, prospective entrepreneurs in *low income* Borghi are more susceptible to the (sunk) costs required to start and run entrepreneurial activities, hence their entry decision is more—and significantly—dependent on the presence of the platform. On the other hand, there are some famous Borghi among the subsample of *high income* Borghi that are well known in the international tourist community.[31] In such cases, given the remarkable reputation of these Borghi, the opportunities for entrepreneurs are already present (e.g., a Borgo may already be accredited as a must-visit touristic destination on the overall touristic market), and they do not require the platform to trigger such opportunities. Similarly, the presence of significant effects in "accessible" Borghi clearly relates to demand-side mechanisms. Indeed, transport accessibility is a necessary condition to attract tourists (i.e., tourists organize their trip according to how easy it is to arrive in a Borgo) and makes the platform capable of generating contextual demand for local businesses (which in turn has a positive effect on the local entrepreneurial activity).

5.3 | Heterogeneity in industrial sectors

In the last step of the analysis, we tested for the presence of heterogeneous effects across nine different industrial sectors (that is, those reported in Appendix A2 in Supporting Information). In this case, the dependent variable was represented by the number of active firms (i.e., typically in the form of associations or partnerships) across each sector. The most demanding specification of the staggered DID, which conditions the parallel trend assumption on the stock of residential dwellings, the number of hotel beds, and the lagged values of the dependent variable, is shown in Table 6. We also present the results of a tenth model (in the last column of Table 6), in which the dependent variable is the total number of firms ($FIRMS_{i,t}$). We observed a certain degree of heterogeneity across the industrial sectors, according to the significance and magnitude of the effects. It is worth noting that in some cases we found positive, albeit weakly significant, results (either concerning sectors or the total number of firms), with *p*-values that slightly exceeded the common acceptance thresholds (e.g., $p = .101$ for hospitality services whenever never-treated Borghi were used as a control group). These cases are mentioned in the notes under Table 6.

We found that the sectors that benefited the most from the entry of Airbnb are those industries that are closely connected to the touristic sector, thus suggesting that platform entry modified the structure of the local economy. We estimated the following effects: transportation (+7.6% to +8.0%— control groups: not-yet-treated and never-treated, respectively), manufacturing (+3.8% more firms—when the control group is never-treated Borghi), hospitality services (i.e., restaurants and other accommodation activities, +4.2%—when the control group was not-yet-treated Borghi), and entertainment services (+8.5%—albeit with a *p*-value equal to .104—in the specification where the not-yet-treated Borghi were used as the control group).[32] The other sectors did not witness any significant change after the entry of Airbnb. Finally, the estimates of the total number of firms show a positive, albeit weakly significant, effect (*p*-value .12).[33]

These results are in line with our theoretical development and point out scope convergence between the digital platform and local entrepreneurs. On the one hand, we can see that sectors that are not directly connected to the touristic activity, such as financial services (which are typically collocated in urban areas) or real estate are not influenced by the entry of the platform. On the other hand, the results presented in Table 6 suggest that the demand captured by the Airbnb home-sharing platform permuted into novel demand for those products/services that are adjacent and closely interconnected with the touristic sector, thereby showing that the opportunities enabled by the platform are only perceived by a subset of entrepreneurs. We interpret this as an additional indication of the presence of demand-side mechanisms (i.e., transfer of the demand from the platform to the local entrepreneurial activity) and supply-side ones (i.e., reduction of the investments required of entrepreneurs and the possibility of integrating complementary resources with the platform) that stimulate the decisions of prospective entrepreneurs.

TABLE 6 Heterogenous effects across the industrial sectors.

Y = number of active firms by the ATECO 1 code										
	AGR	**MFCG**	**TRD**	**TRSP**	**HSP**	**FIN**	**RE**	**TA-SUP**	**ENT**	**FIRMS**
Control group: Never-treated units										
ATE	0.036 (0.027)	0.038* (0.023)	0.012 (0.021)	0.080* (0.044)	0.041 (0.025)	0.046 (0.037)	0.026 (0.032)	0.057 (0.039)	0.087 (0.057)	0.036 (0.023)
N	2448	2448	2448	2448	2448	2448	2448	2448	2448	2448
Cond: $DWELL_i$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cond: $HOTELBEDS_i$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control group	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.	Nev. Tr.
Control group: Not-yet-treated units										
ATE	0.036 (0.027)	0.036 (0.023)	0.013 (0.021)	0.076* (0.042)	0.042* (0.025)	0.047 (0.035)	0.032 (0.032)	0.059 (0.039)	0.085 (0.052)	0.036 (0.024)
N	2448	2448	2448	2448	2448	2448	2448	2448	2448	2448
Cond: $DWELL_i$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cond: $HOTELBEDS_i$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cond: $Y(i,t-1)$	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borgo FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control group	Not yet	Not yet	Not yet	Not yet	Not yet	Not yet	Not yet	Not yet	Not yet	Not yet

Note: "Cond" stands for the condition of the parallel pre-trend assumption, which was implemented through a doubly robust estimator. The dependent and conditional variables were all log-transformed. "Nev. Tr." means that never-treated units were used as the control group. "Not yet" implies that not-yet-treated observations were used as the control group to estimate ATE. ***$p < .01$; **$p < .05$; *$p < .10$. The *p*-values for FIRMS are .12 in both cases. The *p*-value for HSP, when using Never-Treated Units as the control, is equivalent to 0.101. The *p*-value for MFCG using Not-yet-Treated Units as the control is equivalent to 0.114. The *p*-value for ENT using Not-Yet-Treated Units as the control is equivalent to 0.105. All the models employed Borgo level and Year fixed effects, FE. All the models adopted clustered robust standard errors at the Borgo level. FIRMS is equivalent to the sum of all the active firms across the nine relevant industrial sectors.

5.4 | Robustness checks

We tested the robustness of the results by assessing the sensitivity of the identified average treatment effect to the different empirical choices.

5.4.1 | Robustness checks for the "intensive" margin

Alternative treatment definitions. We designed our staggered DID by starting from the definition of the treatment, which was operationalized as the opening of the first Airbnb within a Borgo, thereby implicitly assuming that the opening of only one Airbnb is sufficient to trigger entrepreneurial opportunities. However, we acknowledge that this definition may suffer from some limitations, particularly regarding the power of just one Airbnb host to create such an effect. To this end, we conducted a robustness analysis in which we assigned the treatment based on the distribution of the penetration of Airbnb within a Borgo (computed as the number of active Airbnbs per unit of surface) across all the treated Borghi. Rather than assigning the treatment to the opening of the first Airbnb, we treated a Borgo when the penetration of Airbnb exceeded the second, fifth, and tenth percentiles. The results (obtained employing the most demanding specifications) are reported in Appendix A9 in Supporting Information and show the robustness of our estimates.[34]

Alternative estimators. We also tested the robustness of the results using alternative estimators that are considered suitable for the staggered treatment design, namely those of Borusyak et al. (2024) and Sun and Abraham (2021). Since Callaway and Sant'Anna (2021) treat covariates in a different manner from the other estimators (Roth et al., 2023), we first implemented a matching procedure to compare the most similar treated Borghi with the control Borghi across all the estimators (as done by the inverse probability weighting adopted in the main estimates with Callaway & Sant'Anna, 2021). Thus, we exploited the Coarsened Exact Matching (CEM) procedure suggested by Blackwell et al. (2009) to perform the matching between the treated and control Borghi, considering the same rationale (i.e., the variables) as that of the main models.[35] Appendix A11 in Supporting Information provides the results of the comparison for all the estimators and shows both the static and dynamic average treatment effects (i.e., event-study). We also estimated a Callaway and Sant'Anna (2021) model and a standard OLS with a two-way fixed effect model on the CEM-matched sample to provide a benchmark. As can be observed, our results basically do not differ across the estimators.[36]

5.4.2 | Robustness checks for the "extensive" margin

Alternative sample (use of matched sample). We estimated Equation (2) on the subset of CEM-matched Borghi to ensure a better coherence and comparability between the staggered DID models (Section 5.1) and the continuous treatment DID approach. In other words, we re-estimated models M1.1 to M1.4, as shown in Table 4, on the subset of the CEM matched Borghi with the $DWELL_i$, $HOTELBEDS_i$, and the INCOME and INCOMEpc values for 2009, according to the dependent variable. The obtained results are available in Appendix A13 in Supporting Information and do not differ significantly, in terms of sign or significance, from those shown in Table 4.

Alternative IV share component. The results of a robustness check on the Control Function estimates, in which we changed the share component of the IV, employing a 10-year lagged value of residential dwellings, are shown in Appendix A14 in Supporting Information. Again, the results appear to be comparable with those reported in Table 4.

Pure demand-side continuous treatment. Finally, we exploited a different definition of the local penetration of Airbnb by looking at the actual usage of Airbnb (i.e., at the demand) as a proxy for the number of tourists arriving in a Borgo, rather than at the number of active listings (i.e., the supply). The results, and the relative explanation of the variables (whose operationalization was based on examples found in the literature, e.g., Rossi, 2024), are presented

in Appendix A15 in Supporting Information, and they generally confirm the positive and significant effects of Airbnb on local entrepreneurial activities, in this case through pure demand-side mechanisms.

6 | ADDITIONAL ANALYSES: UNDERSTANDING THE MECHANISMS THROUGH VISITORS' REVIEWS

We also exploited a multimodal approach (Shrestha & He, 2022) to gather additional qualitative–quantitative evidence on the mechanisms behind the effects theorized in Section 3 and confirmed in Section 5. We leveraged an additional dataset containing 192,695 customers' reviews left on the Airbnb listings pertaining to Italian Borghi between 2015 and 2019,[37] since they are considered sources of relevant information on online platforms (Chen & Xie, 2008).

We analyzed these reviews in two ways. First, we analyzed the country of origin of tourists who had left a review to gather insights on the supposed demand-side mechanisms. Second, we examined the text of each review by exploiting a topic modeling technique (Angelov, 2020; Shrestha & He, 2022) to gather information on the supply-side mechanisms. Explanations of the methods and the result tables are available in Appendix A16 in Supporting Information.

The analysis of the customers' provenience supports the hypothesis that a "demand shock" is one of the mechanisms through which Airbnb generates opportunities for entrepreneurs. We found that, although the demand from Italy is relevant, 78% of the customers come from abroad, according to a long-tail distribution.[38] Coherently, and in support of our arguments, we also found descriptive evidence that Borghi with a greater Airbnb penetration also exhibits larger shares of foreign customers (see Table A16.3 in Supporting Information). In other words, the greater the diffusion of the platform within a Borgo, the greater the likelihood of reaching customers from distant (foreign) countries. We interpreted this evidence as the ability of the digital platform to exploit the benefits of local and global network effects, which are not only relevant for the evolution of the platform itself (Parker et al., 2016; Stallkamp & Schotter, 2021), but, as in this case, they also represent a source of opportunities for local entrepreneurs who run businesses related to the core activity of the platform. Importantly, this evidence highlighted a particular feature of the platform, that is, the capability of sponsoring—and collocating—marginal locations on an international market.

Similarly, the textual analysis of customers' reviews offers a comprehensive overview of the supply-side dynamics that take place between the platform and the local entrepreneurs. We found a subset of reviews that had focused on recommendations about local restaurants and amenities offered by the host, as well as on descriptions of the location and accessibility to services offered by local entrepreneurs. These results point out how the platform is capable of influencing entrepreneurs' decisions, in this case through pure supply-side effects: customers who had a gratifying stay tend to sponsor the location and the services offered by local entrepreneurs for future visitors. Indeed, we also found that Borghi with a greater presence of such "topic-related" reviews exhibited a larger positive effect on the growth of entrepreneurial activity (Table A16.5 in Supporting Information).

Finally, a qualitative analysis of the contents of these reviews offers additional insights, again in support of both demand- and supply-side mechanisms. These reviews show the presence and the relevance of the word-of-mouth mechanisms through which Airbnb hosts sponsor local consumption amenities for future visitors: "Excellent accommodation, precise and attentive host, also in the immediate vicinity excellent restaurant recommended by the host himself" (Review ID: 128458); "Denis was super friendly and helpful for any questions you have, he gives us suggestions for restaurants and places to visit" (Review ID: 159710), thus confirming that part of the activity (and costs) needed to promote local businesses is internalized by the platform. We also found evidence of the possibility of the integration of hosts in related services outside the boundaries of the platform: "Vito and Caterina are wonderful hosts, highly recommend a dinner at Vito's restaurant: Melchiò" (Review ID: 144288). This suggests that, in some cases, entrepreneurial opportunities can also arise for those entrepreneurs who are already involved in the platform,

because of scope complementarity between the core business of the platform and possible contextual entrepreneurial activities (e.g., food services, as in the quoted example).

Taken together, these descriptive analyses point out the importance of scope complementarity between the platform and entrepreneurs in triggering local business opportunities.

7 | DISCUSSION AND IMPLICATIONS

The results of our analyses offer theoretical contributions to the literature on entrepreneurship and digital platforms, as well as practical insights for policymakers.

7.1 | The theoretical contributions to (digital) entrepreneurship literature

First, our study contributes to the stream of literature that investigates the role of digital platforms in fostering entrepreneurial activities (Agrawal et al., 2018; Burtch et al., 2018; Kim et al., 2023; Srinivasan & Venkatraman, 2018). Complementarily to previous findings, which depicted either positive effects (Kim et al., 2023) or negative ones (Burtch et al., 2018), we show that when the contextual conditions are unfavorable (i.e., risky "sunk" investments, high entry barriers, and scarce demand prospects)—such as those of marginal areas—digital platforms can create opportunities for local entrepreneurs. Theoretically, suitable explanations for the results can be found in the opportunity discovery approach to entrepreneurship (Alvarez et al., 2013; Kirzner, 1997; Shane & Venkataraman, 2000) and in the External Enabler framework of Davidsson (2015). Indeed, as rooted in this literature, opportunities can arise as a result of market imperfections, which, in this article, are well represented by a "local" technological shift—that is, the *entry* of the "spatially localized" digital platform that acts as an External Enabler. All the empirical results discussed in this paper concerning Airbnb and the setting of Italian Borghi refer to this theoretical concept. In particular, the heterogeneity analysis, in which we compared *low-income* Borghi with *high-income* ones, reinforces the specific role of platforms as opportunity enablers under marginal economic conditions, as it shows that the entry of the platform is capable of triggering opportunities in locations where the contextual economic conditions are particularly unfavorable for prospective entrepreneurs.

Second, we offer a new and more comprehensive understanding of the intricate relationship between platforms and entrepreneurship (Srinivasan & Venkatraman, 2018) by assessing the mechanisms and channels through which digital platforms create such opportunities. We show, through a quantitative analysis (i.e., Sections 5.2 and 5.3) and a qualitative–quantitative analysis (Section 6), that the overall positive effect on entrepreneurship is, in fact, the result of multiple and complex mechanisms that can act together. We show that although it is true that demand-side mechanisms, resulting from the benefits of network externalities (Parker et al., 2016), are present (see: the necessity of a Borgo being *accessible* to materialize the effect, or the vast and variegated provenience of Airbnb visitors to Borghi), supply-side mechanisms are also likely to stimulate local entrepreneurship. In agreement with Kim et al. (2023), we show that platforms stimulate entrepreneurship by lowering the resources needed to embark on the creation of new ventures, thereby showing the existence of a "conservation" mechanisms, as theorized by von Briel et al. (2018). Indeed, in the case of Borghi, entrepreneurs need to invest fewer resources to generate a sufficient demand (e.g. promotion). The platform, in fact, internalizes such activities and performs them either online (i.e., by showing former customers' reviews, as shown in Section 6) or offline (i.e., as a result of a local social interaction between the platform's participants and the presence of a word-of-mouth effect, see Section 6). The prominent role of platforms in reducing investments—usually of the "sunk" kind—also allows entrepreneurs to reduce the time needed to enter the market, hence depicting a "compression" mechanism (von Briel et al., 2018), as confirmed by the event studies, which estimated an almost immediate effect on local entrepreneurship following the entry of Airbnb into a Borgo.

A similar mechanism that affects entrepreneurial opportunities, but which is novel to the current scientific debate, concerns the presence of scope economies between the platform and entrepreneurs working outside the platform (as in our case). The sector-level heterogeneity analysis showed that the diffusion of Airbnb in Borghi created opportunities, within the scope of the platform, by fostering entrepreneurial activities in the transportation, hospitality, and entertainment sectors (Section 5.3). This is in line with the idea proposed by Jacobides et al. (2018) of platforms being at the core of an "Ecosystem" structure. One possible explanation of this result, as reported in Section 6, pertains to the fact that the platform allows entrepreneurs to integrate online services on the platform itself (e.g., being an Airbnb host) with offline ones—outside the platform (e.g., managing a restaurant). The existence of this (additional) effect has two implications. First, it permits prospective entrepreneurs to share resources across the platform and the contextual local business, that is, digital platforms (i.e., Airbnb in our case) can stimulate entrepreneurship by means of scope convergences between the online and offline activities. On the other hand, as confirmed by the analysis of the reviews in Section 6, we evidenced that the nature of the relationship between platforms and entrepreneurs is bi-univocal, that is, it is not only the platform that creates opportunities for entrepreneurs, entrepreneurs also create value for the services that the platform offers.

The presence of these mechanisms, which occur between the diffusion of platforms and the growth of contextual entrepreneurial activities outside the boundaries of the platform, makes an important contribution to the platform-enabled entrepreneurship literature. The seminal work of Srinivasan and Venkatraman (2018) pointed out platform-enabled opportunities for entrepreneurs who acted as complementors on digital platforms. Our paper shows that the opportunities triggered by the diffusion of digital platforms can overcome the boundaries of the platform itself, as spillover effects can also be expected for those entrepreneurs who pursue their business activities outside the digital platform but within the broad ecosystem in which the platform plays an essential role (Jacobides et al., 2018).

7.2 | Implications for policymakers

This study has important implications for policymakers who would like to stimulate entrepreneurial activity in marginal contexts. This article, which is in line with the work of Kretschmer et al. (2022), shows that platforms, by acting as meta-organizations, can stimulate entrepreneurial activities and support the role of institutions in reaching this goal. Therefore, our study indicates that a possible, indirect, and novel way of favoring entrepreneurial activities in marginal areas is to sustain the diffusion of digital platforms in order to endogenously stimulate entrepreneurial opportunities.

This study also has particular implications with reference to the analyzed platform and sector. The externalities generated by the rapid growth of the tourism sector have, in fact, been extensively debated in literature (Faber & Gaubert, 2019) and represent a crucial aspect in policy makers' agenda, since overtourism and short-term rental platforms (Airbnb) are determining serious problems for local communities (Barron et al., 2021; Garcia-Lopez et al., 2020). In contrast to the main literature referring to work conducted on urban centers (Garcia-Lopez et al., 2020), we show that in specific contexts (i.e., marginal areas in which there is an excess in the housing capacity), Airbnb can generate positive externalities by stimulating entrepreneurial activity. Importantly, as reported in Appendix A17 in Supporting Information, this effect may not come in conjunction with its typical negative externalities (Barron et al., 2021), as we found (descriptively) that the entry of Airbnb into Borghi was not significantly associated with increasing income inequality or increasing long-term rental prices (probably because of the large idle capacity that is present in these contexts). Therefore, two main indications can be derived for policymakers.

First, and in support of the current debate on short-term regulations (Bei & Celata, 2023), policymakers should be aware of the fact that, as short-term rentals diffuse, heterogeneous effects may arise, depending on the context where they diffuse. Hence, nationwide policies could be harmful, as they could cap potential positive spillover effects, such as those evidenced in this study.

Second, we offer policymakers a new vision of short-term rentals (and platforms) as facilitators of regeneration processes in marginal contexts. This is relevant, as marginal, nonurban, locations are willing to welcome a relevant part of the population[39] and, as is known, direct entrepreneurship policies that are targeted at favoring business creation processes do not always turn out to be effective (Shane, 2009). We evidence that one of the reasons why platforms can be effective in reaching this goal is the interconnection between the global scale of the digital platform and the local externalities generated by its diffusion (Stallkamp & Schotter, 2021). In other words, digital platforms offer policymakers the possibility of planning local development policies in marginal and rural contexts from a geographically wide perspective.

8 | LIMITATIONS AND FUTURE DEVELOPMENTS

This study is not exempt from limitations, which, however, can help pave the way for novel research.

First, although our study is one of the first to have tackled the diffusion of digital platforms in marginal contexts, we have focused on a specific empirical setting, Italian Borghi. Although, as reported in Section 3, these destinations are clearly representative of generalizable conditions (i.e., an unfavorable economic outlook and barriers to the entrepreneurial process), it could be worthwhile for future researchers to focus on areas with different socioeconomical characteristics and on different digital platforms. We believe that researchers could build upon new unique settings by combining areas—and the corresponding local characteristics—and digital platforms to provide new empirical evidence. It is worth noting that similar effects may be derived from the diffusion of digital platforms other than Airbnb, which offer "spatially localized" services (Section 3.2.), in that a close connection with local markets may trigger externalities on local entrepreneurship.

Second, although we have used information from 2009, which is when Airbnb began to diffuse in Italy (i.e., the first Airbnb opened in Italy in June 2008), our dataset stops at the end of 2019. Since the entry of Airbnb in our sample is largely focused on the period between 2011 and 2014, we have used an average of 5 years to evaluate the long-term effects of the home-sharing platform on the outcome variables. This could be considered a limitation, as we might not have observed periods of over-diffusion of the platform, which could create negative effects, such as those reported in the existing literature about cities (Barron et al., 2021; Carrasco-Farré et al., 2022; Chen et al., 2022; Garcia-Lopez et al., 2020). To this end, we conducted a visual inspection of the stage of diffusion of Airbnb within the Borghi (available in Appendix A18 in Supporting Information), which showed that the home-sharing platform in the treated Borghi was, on average, close to the maturity stage of diffusion in 2019 (i.e., the flat part of the logistic curve).

Finally, our study exploits Borgo-level aggregated data, since no specific data on individual entrepreneurs was available. This posits a limitation, as a deeper understanding of entrepreneurs' decision-making processes could have been derived if individual data had been available. Although our analysis is connected to digital platforms as enablers of opportunities, and hence embraces the opportunity discovery approach to entrepreneurship (Alvarez et al., 2013; Kirzner, 1997; Shane & Venkataraman, 2000), some characteristics of the research setting and some results leave space for a potential theoretical extension to the judgment-based approach (Foss & Klein, 2010). According to this latter theoretical approach, entrepreneurial activity is characterized by uncertainty, which makes entrepreneurial decisions subjective to the judgment of the individual entrepreneur about his/her beliefs about the demand and prospect market conditions. In line with this point of view, the dynamic effects on local entrepreneurial activity following Airbnb's entry, and the heterogeneous results across sectors can also be explained by the presence of an entrepreneur's heterogeneous judgmental process on who should decide when and how to pursue the opportunities created by the entry of the platform and which are immediately evident in any Borgo. Therefore, we suggest the need for future studies to understand the nature of the relationship between platforms and entrepreneurship in more depth, through individual data, according to the different possible approaches: opportunity-based (Alvarez

et al., 2013; Kirzner, 1997; Shane & Venkataraman, 2000), judgment-based (Foss & Klein, 2010), or a novel hybrid approach between the two, as some evidence in this paper would seem to suggest.

9 | CONCLUSIONS

This study shows the positive effect of digital platforms on entrepreneurial opportunities in marginal areas. Through an empirical analysis of the unique empirical setting of Italian Borghi and the corresponding entry of Airbnb, we have estimated to what extent the platform stimulated local entrepreneurial activities.

These effects are heterogeneous across Borghi, as only *accessible* ones fully benefit from the entry of the platform (akin to demand-side mechanisms). Likewise, we have found that only in *low-income* Borghi does the entry of the platform create a significant impact on local entrepreneurship (in this case, suggesting the presence of supply-side effects). Finally, we have found that only sectors related to the core activity of the platform (i.e., tourism) perceive the stimulus to a significant extent (hence referring to potential scope sharing between the platform and local entrepreneurs). We have also provided qualitative–quantitative evidence on the ways through which Airbnb creates these effects, and we have simultaneously depicted the following ones: demand creation through wider (online) visibility, online and offline word-of-mouth, and, perhaps in certain cases, integration between entrepreneurs' offline (i.e., off-platform) and online activities (i.e., on-platform business).

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ENDNOTES

[1] A crucial point should be clarified. This article studies the spillover effects that derive from the diffusion of Airbnb on entrepreneurial activities that arise outside the boundaries of the platform. In other words, we study the effects that stem from the intensity and the diffusion of Airbnb on entrepreneurship in various sectors (e.g., transportation, entertainment) in the surrounding area, but not on Airbnb hosts themselves.

[2] The definition of a Borgo is presented in Section 3.1 (according to the definition of the Italian Ministry of Culture).

[3] Similarly, platforms that are active in the food-delivery market (e.g., Glovo) prefer to concentrate operations on larger cities rather than on smaller destinations.
This happens because platforms like Uber are characterized by *centralized* decisions that are taken by the platform itself (i.e., it is the platform that decides where to start its services). Coherently, in this case, these platforms decide where to geographically compete to maximize their potential profit perspectives, which means that they mostly focus on economically developed and attractive markets. Airbnb, on the other hand, leaves the decision to the hosts (i.e., decentralized; Einav et al., 2016) so that it is also possible to observe this platform on apparently unattractive markets.

[4] See the declaration of the President of the official Italian association "I Borghi più Belli d'Italia" (which collects all the officially recognized Borghi within the Italian territory), in which it is stated that "This initiative [the startup of the association, editorial note] arose from the need to enhance the great heritage of history, art, culture, environment and traditions present in small Italian towns which are, for the most part, marginalized by the flow of visitors and tourists. In fact, there are hundreds of small "Italian Borghi" that risk depopulation and consequent degradation due to a situation of marginalization with respect to the economic interests that gravitate around the tourist and commercial movement."

[5] Therefore, our research does not deal with entrepreneurs as "in the common language," namely working on highly technological products/services that bring innovation onto the market. However, we are confident that the entrepreneurs that we have studied perform all the actions that characterize an "entrepreneur," as clearly recognized in the scientific literature (Ahmad & Seymour, 2008; Eisenmann, 2013).

[6] Hereafter, we refer to "entry" as the opening of the first Airbnb in a given location.

[7] All the statistics in this section refer to the sample of 270 Borghi mentioned in Section 4.1 and were derived from the official list of *I Borghi più belli d'Italia* (www.borghipiubelliditalia.it).

[8] In line with the definition, we have provided in Section 1.

[9] For example, here a press article that explains how attractive and interesting some Borghi are: Article #2, Il Sole 24 Ore (2020): https://www.ilsole24ore.com/art/recuperare-borghi-d-italia-puo-valere-2-miliardi-ADq10Dm.

[10] The risk and the potential "sunk" nature associated with the entry investments in our context (i.e., Borghi) deserve further elucidation. Indeed, although there are specific entry costs for these areas (e.g., renovation obstacles because of the presence of protected heritage), these obstacles can be counterbalanced by the lower investment costs required to access real estate, which are significantly lower than those of the urban market, as a large idle capacity is present. Accordingly, we conjecture that the recoverability (hence how entrepreneurs are able to recover their investments by "successfully" closing their business, Bates, 2005) may play a crucial role in entrepreneurs' decisions. Indeed, we believe that while there are opportunities to "successfully" close small businesses on urban markets, this is not the case in marginal areas, due to the difficult boundary conditions (e.g., see, for instance, Yu and Artz (2019) demonstrates that the return to skills in small businesses is significantly larger in urban areas than in rural ones).

[11] According to this, the Airbnb statement aimed at offering unique experiences to customers that are different from the traditional accommodation ones (i.e., by intercepting possible new patterns in customers' preferences), is well known. In most cases, Borghi represents a novel panorama for the international touristic market, thus being in line with the interests of the platform.

[12] It is worth to noting that we tested both mechanisms (i.e., increasing accommodation capacity and sponsoring on the platform) in the empirical analyses, as we referred to both "intensive" and "extensive" margins. However, despite not being able to test a *price effect*, it is possible, according to Farronato and Fradkin (2022), that such an effect may also concur in the generation of new demand for local business activities. Indeed, by extending the accommodation capacity, Airbnb can trigger local competition with other accommodation services (e.g., hotels, when available in a Borgo), so that accommodation rates may decrease, hence attracting more visitors.

[13] It should be noted that we tested this theoretical prediction in Section 5.3 by looking at the sectors affected by Airbnb entry.

[14] Airbnb allows different types of listings to be active on the platform, namely Entire Apartments and Rooms (either private or shared). In our empirical setting, most of the listings active in Italian Borghi refer to Entire Apartments, as the average share of apartments over the total listings is equivalent to 74% and the median share is equivalent to 80%.

[15] It is worth noting that there are both ordinary and simple entrepreneurs in Italy, and their classification depends on the typology of the firm (e.g., limited liability for the former kind of entrepreneurs, and associations/partnerships for the latter). Our variable is a composite metric that sums both types of incomes declared by the two types of entrepreneurs. For the sake of clarity, it should be mentioned that most of the income comes from Simple entrepreneurs, as they represent the most diffused type of firms active in the Borghi context.
This variable is particularly suitable for our study (i.e., it estimates the *indirect* effects of Airbnb entry on the entrepreneurial activity) as the income gained from the Airbnb platform is not declared in the income tax declaration obtained from entrepreneurial activities (which would hence result in a *direct* endogenous effect), since it falls under the "income from rents" heading. This declaration is necessary to make the income from Airbnb subject to the "Cedolare Secca" tax, which allows hosts to pay a flat tax of 21% on the income generated by short-term rentals.

[16] We also provide additional evidence on the ratio between INCOME and INCOMEpc, which we have called ENTR (which stands for entrepreneurs). ENTR represents the average number of people who declare income from entrepreneurial activities in each Borgo.

[17] The website link is accessible on: https://www.unioncamere.gov.it.

[18] For the sake of clarity, it is worth discussing the meaning of the "manufacturing" sector dealt with in our case study. Given the nature of Borghi, the firms considered in this sector are not large manufacturing companies with large industrial plants, and in fact mostly refer to small manufacturing activities, mainly related to artisanship or hand-crafted products.

[19] In this sense, it is worth noting that the control group we chose for our analysis was particularly suitable for the purpose of the study as both the treated and the control units were taken from an official list of Italian Borghi.

[20] Such a problem arises when the treatment is staggered and there are no valid reasons to argue that the treatment effect is homogenous over time, because of the presence of "forbidden comparisons" (Goodman-Bacon, 2021). Appendix A3 in Supporting Information helps explain the phenomenon of negative weights.
Nonetheless, Appendix A3 in Supporting Information shows the Goodman-Bacon (2021) decomposition applied to our empirical setting. As reported, much of the variation comes from the comparison between the Treated versus Never-Treated Borghi (around 57% of the total weights for both INCOME and INCOMEpc). Early-Treated versus Late-Treated Borghi account for an additional 10% of the variation, while the "forbidden comparisons" (Late-Treated vs. Early-Treated Borghi) account for 30% of the total weights. This suggests the importance of applying appropriate DID models to account for the presence of forbidden comparisons.

[21] The subscript *i* indicates a Borgo, *i*, within the sample of 270 analyzed Italian Borghi.

[22] We used the number of unoccupied dwellings from the National Census in 2011 for our analyses. Although the panel starts in 2009, and Airbnb started entering Borghi in 2009, we are confident that the stock of unoccupied dwellings in 2011 was not significantly impacted by the penetration of Airbnb in those 2 years, which would have invalidated our results. Nonetheless, we also provide the results of a robustness check on this choice in Section 5.4.

[23] It is worth to note that in our data we measure the income from entrepreneurial activity declared within the Borgo and the number of firms (by industrial sector) registered inside the Borgo. We are confident that this specificity does not influence the scope of our analysis. On the one hand it could represent a limit, as we do not directly observe entrepreneurial opportunities pursued by entrepreneurs living outside the Borgo. However, if this is the case, our estimates could represent a conservative lower bound as we would not account for all the opportunities created by the entry of the platform. On the other hand, given the nature of the firms we observe, the likelihood of multi-site firms is also negligible. Indeed, as anecdotal evidence, we recall that almost all firms active in the Borghi have the legal form of simple association or partnerships, hence akin to simple and local entrepreneurship.

[24] This implementation of the staggered DID estimator relies on a working assumption. It, in fact, proxies the treatment with the opening of the first Airbnb in a Borgo. For the sake of completeness, we relaxed this assumption in the robustness checks (Section 5.4) by varying the definition of the treatment.

[25] It is worth noting that the econometric literature concerning the estimation of the average treatment effect has rapidly advanced in the last few years (Roth et al., 2023) beyond the contribution of Callaway and Sant'Anna (2021). Different estimators, such as the Borusyak et al. (2024) imputation estimator, or the Sun and Abraham (2021) one, represent new options that can be used to deal with the case of a staggered treatment design and the corresponding issue of negative weights. In this work, we have mainly adopted the Callaway and Sant'Anna (2021) estimator for two main reasons. First, the Borusyak et al. (2024) estimator is preferable to the Callaway and Sant'Anna (2021) one when the dependent variable is not too serially correlated (Roth et al., 2023), and this was not the case in our work. Second, and even more importantly, the Callaway and Sant'Anna (2021) estimator allows control variables (in this case, DWELLi and HOTELBEDSi) to be included allowing both inverse probability weighting and a regression adjustment, while other estimators include covariates in a linear manner only (Roth et al., 2023). However, for the sake of completeness, we also estimated our models using the other available estimators and employed a Coarsened Exact Matching (CEM) procedure (Blackwell et al., 2009).

[26] Only Models M1 (no condition on the parallel pretrend, thus assuming that all the Borghi are equally comparable) and M3 (only conditioning HOTELBEDS) provided positive and nonsignificant results.
The models show that the conditioning of HOTELBEDS does not significantly influence the results. However, the inclusion of this variable as a conditioning of the parallel trend assumption is relevant as it makes the comparison between the control and treated groups more precise, since it considers differentials in the touristic attractiveness of a Borgo that could influence both the opening of Airbnb and the local entrepreneurial activities.

[27] We found positive, albeit not significant, results for the late point in time ($T = 7$ or 8). We believe that this is because only a few observations are available for these time periods (i.e., only Borghi treated in 2010 and 2011 allow such effects to be estimated), and the standard errors thus become larger.

[28] For the sake of completeness, we also computed an approximation of the number of entrepreneurs active in a given Borgo ($ENTR_{i,t}$) by considering the ratio of the $INCOME_{i,t}$ variable to the $INCOMEpc_{i,t}$ one. We then tested the same specifications as those shown in Table 3 with this alternative dependent variable, which has the advantage of not being

influenced by monetary values, although it represents the *actual quantity* of entrepreneurs. The estimates obtained when employing the Callaway and Sant'Anna (2021) estimator are reported in Appendix A7 in Supporting Information. We found that the number of people who declared entrepreneurial income on average increased by 3.37–4.11 following the entry of Airbnb in the treated Borghi.

[29] The results of the first stage of our model are provided in Appendix A8 in Supporting Information, and the performance of our IV, as obtained using a stepwise approach, is also shown. As can be observed, our IV can be considered a significant (and positive) predictor of Airbnb penetration as all the specifications are significant at a 99% confidence level.

[30] We tested four different model specifications: M1, which only included Borgo fixed effects, M2, which included two-way fixed effects, M3, which added a Borgo-specific linear trend, and M4, which controlled for the additional covariates reported in Section 4.2.2.

[31] See, for example, Alberobello, which has been accredited by CNN (https://edition.cnn.com/videos/travel/2023/12/18/quests-world-of-wonder-alberobello-italy-picturesque-trulli-hobbit-house-spc.cnn).
In this case, it is evident that the Borgo is widely accredited on the international touristic market, hence, regardless of the diffusion of the platform, demand and visibility are secured. This condition is quite different from the subset of *low income* Borghi, where the need to create demand (internalized by the platform) is necessary to trigger business opportunities.

[32] For the sake of clarity, it should be mentioned that we found the following results to slightly exceed the common statistical acceptance threshold: +4.1% for the hospitality sector when never-treated Borghi were used as the control group, although a *p*-value equal to 0.101; +36% was found for the manufacturing sector when not-yet-treated Borghi were used as the control group, although with a *p*-value equal to 0.114. Given the nature of the study, the *p*-value, which was very close to the threshold of 0.100, and considering that the estimated coefficients turned out to be significant in other specifications (Section 5.4.), we still believe that these results provide a reliable indication of the heterogeneous effects of Airbnb entry by industrial sector.

[33] The fact that the average treatment effect on the total number of firms ($FIRMS_{i,t}$) is not significant does not invalidate our results. First, the $FIRMS_{i,t}$ variable was constructed as the sum of 9 different sectors, hence, depending on the relative size of each sector, it is possible to observe an insignificant increase in the total number of firms, although some specific sectors may grow. This is naturally an indication of the fact that Airbnb entry changes the structure of the local industry, but it is also possible to state, considering the $INCOME_{i,t}$ and $INCOMEpc_{i,t}$, estimates, that the overall entrepreneurial activity does grow, even when considering that the *p*-value associated with the average treatment effect is slightly above 0.10 (0.12). Second, among the various robustness checks we conducted (Section 5.4.), we found a positive and, more importantly, significant result for $FIRMS_{i,t}$. For instance, when estimating the ATE with the Borusyak et al. (2024) model, we found an increase of 3.5% (*p*-value <0.01), and when estimating it with the Sun and Abraham (2021) model, we found an increase of 3.1% (*p*-value <0.01). Both results, in terms of magnitude, are in line with the estimate conducted using the Callaway and Sant'Anna (2021) model, which is about +3.6%, although with a *p*-value equal to 0.12.
For the sake of completeness, we also replicated the analyses on the subsamples of Borghi depicted in Section 5.2: *low-income* versus *high income* Borghi and *accessible* vs *not accessible* Borghi. As far as accessibility is concerned, we found that positive and strongly significant effects emerged for the total number of firms (+3.2%), transportation (+10%), hospitality (+7.1%), entertainment (+11.7%), agriculture (4.9%), and real estate (9.2%), albeit only in *accessible* Borghi (whereas no effects were found for the not-accessible ones). Conversely, as far as income is concerned, we only found significant effects for firms in the transportation sector in *low-income* Borghi (+21%).

[34] In only two cases, did we find a weakly significant effect (i.e., when a Borgo was treated after Airbnb penetration overcame the 10th percentile of the distribution and when the not-yet-treated observations were taken from the control group). However, these results did not invalidate our estimates, and instead confirmed them. Indeed, according to Callaway and Sant'Anna (2021), the estimator works by comparing posttreatment outcomes with those of the latest pretreatment (namely, $t-1$). Since, in this case, we constructed the treatment assignment by delaying to later periods, although Airbnb had already entered (i.e., when Airbnb penetration overcame the 10th percentile), it is likely that the estimator compared post-treatment outcomes with a pre-treatment baseline already impacted by Airbnb diffusion, which led to weakly significant effects.

[35] Appendix A10 in Supporting Information shows the results of the weighted mean comparison test on the matching variables, which used the sample, and the weights resulting from the application of the CEM matching procedure. As can be observed, when we only selected the sample of matched units and weighted the observations according to the CEM weights, we did not find any significant differences in the mean values between the treated and control units for any of the matched variables (i.e., $DWELL_i$, $HOTELBEDS_i$, $INCOME_{i,2009}$, $INCOMEpc_{i,2009}$).

[36] We also tested the robustness of the heterogeneity analysis (by Borgo characteristics and by industrial sectors) with alternative estimators.

First, Appendix A12 in Supporting Information shows the estimates concerning industry-level heterogeneity. Apart from testing the estimates with Borusyak et al. (2024) and Sun and Abraham (2021) estimators, we also tested a Poisson model, considering that the dependent variables were count data (i.e., the count of the number of firms). Overall, the alternative robustness checks confirmed the results of the main analyses. Briefly, we found that the effects on the transportation and entertainment sectors were positive and significant across all the specifications, whereas we found either significant or no effects on the manufacturing sector, depending on the specification.

Second, we replicated the analyses by Borgo characteristics with the Borusyak et al. (2024) and Sun and Abraham (2021) estimators, and with the standard TWFE. We found that the "*high income* versus *low income*" results concerning the split sample were fully robust with reference to those in Table 5 (particularly when $INCOME_{i,t}$ was the dependent variable), were positive and significant for *low income* Borghi, and not significantly different from zero for the *high income* ones. Instead, we did not find any significant results concerning the "accessible versus not accessible" split sample.

[37] These data were only available, by construction, for "treated Borghi" in the "post-treatment phase". To this end, the discussion of the following statistics is only conducted to explore the potential mechanisms pertaining to the effects of the diffusion of the online platform on the local entrepreneurial activities and only descriptive evidence is reported.

[38] Under the assumption that the likelihood of leaving a review is comparable across regions.

[39] For instance, more than 60% of the inhabitants of Europe live in towns, suburbs, and pure rural areas. Indeed, more than 20% of the EU population is concentrated in pure rural areas. Further information is available at https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=587819.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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