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THE EFFECT OF BEING A EUROPEAN CAPITAL OF CULTURE:
EVIDENCE FROM MATERA¹

Abstract. Tourism is an important, cross-cutting source of income and employment. As a potential tool for development, several governmental and intergovernmental initiatives have been put into place to foster tourism. We study the causal link between a mega cultural event, tourism and economic development exploiting the exogenous variation arising from the shortlisting, and subsequent nomination, to the 2019 European Capital of Culture. The title was awarded to Matera, a culturally-rich yet poorly connected and off-beat town in Southern Italy. By means of event study regressions and permutation tests, we compare changes in Matera to changes in other Italian cities unaffected by the policy. We find a boost in touristic presence, which then translates into a decrease in unemployment, an increase in income, firms and workers in industrial sectors even loosely connected with tourism and a remarkable hike in the real estate market. By analyzing the timing of these impacts, we find evidence of a spotlight effect: Matera starts benefiting from the event since the selection phase, even before being awarded the title, possibly due to increased media exposure. All in all, our findings suggest that the European Capital of Culture event could be a viable way for culturally endowed yet underrated destinations to showcase their attractions, in addition to a credible road to development.

Keywords. Tourism, urban economics, economic development, policy evaluation

1. INTRODUCTION

Tourism is an important and dynamic source of employment in today's global economy, supporting around 10% of all jobs and accounting for one out of four new jobs created worldwide.² Reliance on tourism has also been hailed by many policymakers as a forward option to boost economic activity (Department for culture, media and sport, UK government, 2011) especially in outlying and outermost regions and those lagging behind in terms of economic opportunities (European Commission, 2010). Across the EU, the European Capital of Culture (ECoC) is the most famous example of a cultural policy designed to showcase and raise the in-

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² 2019 figures by the World Travel & Tourism Council.



ternational cultural profile of host cities (European Parliament and European Council, 2014). At the same time, host cities can also seize the opportunity to regenerate themselves and boost their socioeconomic development. Set up in 1985, the European Capital of Culture has grown in popularity and it is now regarded as one of the most ambitious and appreciated cultural initiatives of the EU, with a new schedule financed up to 2033 (European Parliament and European Council, 2014). The policy is so established that it has been mirrored by similar initiatives across the world including the City of Culture in the UK, the Italian Capital of Culture, the French Capital of Culture, the Arab Capital of Culture and the American Capital of Culture. This paper aims at providing evidence of a causal link between a mega cultural event, tourism and economic development by exploiting exogenous variation arising from the shortlisting, and subsequent nomination, to the 2019 European Capital of Culture for Matera, Italy. The paper proceeds by investigating how economic development maps out across several dimensions of the hosting city's economy, from income and labour market to the real estate sector. We believe our setting to be particularly appropriate to answer the questions above. This is because of the nature of both the European Capital of Culture, a massive international cultural festival lasting for one year, and of its host city Matera, a small historical town located in Southern Italy, relatively unknown to tourists yet endowed with a formidable cultural potential awaiting to be unlocked.

While Italy has long been a top destination for tourists, consistently ranking in the top five destinations by international tourism arrivals and in the top ten by earnings from tourism (International Tourism Highlights, 2019 Edition 2019), touristic flows are not equally shared within the country. Matera was indeed largely off the beaten tracks, possibly due to a combination of being poorly connected and subpromoted. The ECoC nomination can therefore be seen as both a significant boost in visibility and an enormous chance for regeneration.

In our analysis, we use event study regressions to compare changes in Matera to changes in other Italian cities unaffected by the policy. Importantly, our specification will enable us to provide both evidence of parallel trends, which is key for identification, as well as to show how treatment effects evolve over time from shortlisting to the event year. This result becomes particularly relevant once keeping in mind that Matera was shortlisted in 2013, awarded the title in 2014 but most cultural events only started in 2019. Our estimates provide evidence of a touristic (re) discovery of Matera, that would have likely continued after the event year had it not been for the Covid-19 pandemic. These results mainly speak to the enormous media attention the city has experienced, which we refer to as the “spotlight effect” throughout the paper, rather than budget expenditure, as we discuss in Section 2.2. To overcome hurdles in claiming statistical significance when the number of treated clusters is low, we draw inference from permutation tests following Buchmueller *et al.* (2011), that is by assigning treatment to each unit in the control group and comparing estimates to the results for Matera.

We leverage on several datasets from different data providers. We start by collecting data on touristic flows, population and labour market indicators, including the number of workers and firms by economic sector, from the Italian National Statistical Institute for Italian provinces in the period 2008 to 2019. We then retrieve city level data on personal income declared for tax purpose from the



Italian Ministry of Economy and Finance. Finally, we obtain information on the housing market, where we observe the number of transactions, at the city level, and prices, at a fine neighbourhood level within each city, from the dedicated statistical body of the Italian Revenues Agency.

Our baseline estimates provide evidence of a strong increase in tourism flows and economic development across several channels. We first document a remarkable rise in the number of tourists checking-in in Matera in 2019, +115%, and of the number of nights they spent there, +52%. Importantly, the sustained increase, building up from shortlisting to the event year, is compatible with a spotlight effect deriving from the media exposure Matera enjoyed. We then show how the touristic expansion reverberated in the local economy with an increase of +9.7% for income declared for tax purposes. These results resonate with the marked decrease we find for the unemployment rate, -7.74 percentage points in 2019. We analyze labour market effects in more details by looking at the number of firms and workers by economic sector (ATECO codes). Our results indicate a strong increase in the number of firms and workers operating in the hospitality sector, with +193% firms in holiday and short term accommodations and +55% workers in hotels. Likewise we document an increase in the number of employees in the cultural sector (+277%) and in the infrastructure-related sector (+49% workers in demolition and +43% in architecture and engineering firms).

These findings are consistent with the cultural nature of the policy and the urban and infrastructural regeneration that came with it. Also related with the latter, we find evidence of a 30% increase in the number of firms involved in real estate trading in 2015. This result matches the increase in the number of real estate transactions we find around the same period, +77%. Finally, we investigate how these effects translate into prices for the housing market. Our estimates point to an increase of +12% in prices when looking across areas and buildings in Matera. These effects are driven by strong increases for housing, +43%, and retail units, +30%, in the historical centre of Matera, consistently with a tourism-led growth. All in all, we find the European Capital of Culture initiative to be a successful tool in positioning Matera and its cultural endowment at the touristic forefront in the region, as well as a credible road to development, placing Matera on the map and all the way up to being chosen as the 2021 host of the G20 Foreign Affairs Ministers' Meeting.

We present several robustness checks to validate our results. Across our event study regressions, identification is contingent on parallel trends between treated and control units in potential outcomes. Although in most models small and statistically insignificant lead effects help in providing evidence of parallel trends, we report estimates from alternative specifications where we relax this assumption, as we discuss in Section 6.

This paper relates to studies across several strands of the literature. We add evidence to the academic debate discussing the positive effects of tourism in fostering the economic development of destinations. Starting from Balaguer and Cantavella-Jorda (2002) for Spain, several papers have tested and confirmed the tourism-led growth hypothesis (Dritsakis (2004) for Greece and Gunduz and Hatemi-J (2005) for Turkey). More recently, Faber and Gaubert (2019) exploit differences in beach quality across Mexico to provide evidence of an effect of tourism on economic development, both at the local and at the national level. On this issue, the closest paper



to ours is Nocito *et al.* (2021) who look at the effect of entertainment media exposure for a set of Sicilian municipalities and show an increase in tourism activities from foreigners (+300%), which is then linked to taxable income (+4.7% for a 10% increase in tourists' expenditure) and employment in the hospitality sector (+10.1% for a 10% increase in tourists' expenditure). We complement the papers above by analyzing the effect of a massive cultural intervention, large parts of which will also work through enhanced media exposure, on a previously not so touristic city in Italy. Our estimates show an increase in tourism (+115%) from both foreigners and natives, a reduction in the local unemployment rate (-7.74 pp), which is mapped out across economic sectors, as well as an effect on the housing market of Matera.

Our estimates also speak directly to papers evaluating the impact of mega events such as the Olympics Games (Baade and Matheson (2016), Billings and Holladay (2012), Rose and Spiegel (2011), Maennig and Richter (2012) and Firgo (2021)) and to studies explicitly looking at the effect of the European Capital of Culture on hosting cities (Falk and Hagsten (2017), Srakar and Vecco (2017), Steiner *et al.* (2015) and Gomes and Librero-Cano (2018)). Research looking at the economic returns of hosting the Olympics have labelled the event a “money-losing proposition for host cities” (Baade and Matheson 2016) with even some of the long-run positive effects found in previous studies (Rose and Spiegel 2011) not confirmed by papers further refining the control group (Maennig and Richter (2012) and Billings and Holladay (2012)). The main methodological challenge lies in constructing appropriate control groups and collecting fine granular data on economic outcomes over many countries. Firgo (2021), to this end, combines a NUTS1 level analysis, with a careful choice of control group, to report evidence of an increase in relative regional GDP per capita. In this paper, effects start to appear after a planning phase of two years and build up over time. Moreover, effects are only visible for Summer Olympics, all in all suggesting that they derive from the larger boost in investment and private consumption compared to the smaller scale of Winter Games.

Our contribution to this debate is to show the importance of the reputation channel, that we refer to as the spotlight effect, stemming from hosting a cultural and year-long mega event through fine granular data. This is the same channel that has likely played a key effect for the successful touristic development of Barcelona, which hosted the 1992 Summer Olympics and moved on to enjoy a robust touristic growth thereafter (Zimbalist 2020). The event we exploit is however much smaller in scope and has a tiny budget compared to the colossal amounts spent on Summer Olympics.³ The two events are also sharply in contrast when it comes to the relationship between their entertainment component and the host city. While the entertainment value of the Olympics Games is roughly homogeneous regardless of where they are hosted, the entertainment component of the ECoC is heavily reliant on the host. Finally, while both types of event are likely to trigger investments in the hospitality industry, hosting the Olympics requires heavy investment for a peak period of about two weeks, compared to year-long European Capital of Culture, and is likely to leave the city with over capacity once the event is over.

³ The city of Chicago alone spent more than the entire operating budget of Matera 2019 for its bidding application to the 2016 title, a process which turned out to be unsuccessful (Baade and Matheson, 2016).



Several papers have commonly reported an increase in tourism following a nomination to host the EcoC (Falk and Hagsten (2017), Srakar and Vecco (2017)). Falk and Hagsten (2017) combine differences in differences with propensity score matching to study the effect on overnight stays on 34 ECoC hosts. They estimate an average increase of 8% or 40,000 nights, which masks highly heterogeneous city-specific estimates. Indeed, according to their study, second-tier cultural cities benefit the most (up to +37% for Weimar, ECoC 1999). Srakar and Vecco (2017) analyze the case of Maribor, Slovenia, ECoC capital in 2012 and find a similar increase in touristic arrivals (+20,000) and overnight stays (+ 50,000). Our estimates are generally higher, likely due to both Matera being similar to the underrated cultural city group in Falk and Hagsten (2017) and to the fact that we compare the event year with the shortlisting year, rather than with the year before the event. Overall, our estimates corroborate findings of positive effects on touristic inflows and show that tourism begins to increase even prior to the event year, around the time when the title is awarded and cities get under the spotlight, providing evidence towards the reputation channel. This latter result is important to explain the magnitude of our results and seems to suggest that previous estimates, which did not take into account the dynamic nature of these effects, might have to be interpreted as a lower bound.

On the other hand, the evidence on economic development and employment remains mixed. Steiner et al. (2015) find no evidence of an effect when it comes to GDP per capita contrasting NUTS2 regions. Gomes and Librero-Cano (2018), instead, show that hosting the ECoC stimulates regional GDP per capita by contrasting NUTS3 regions in a dynamic difference-in-differences set up, but find no evidence of effects when it comes to the labour market. As in Gomes and Librero-Cano (2018), we find evidence of an effect even before the ECoC year. Our estimates on the labour market, however, point towards a 7.74 percentage points reduction in unemployment. As stated in their paper, the lack of effects could be due to measurement error due to the pooling of several host cities; furthermore, by focusing on a single Capital, our estimates are less likely to be affected by any confounders. Similarly, Srakar and Vecco (2017) find a decrease in employed Maribor residents (-3,000). As acknowledged in the paper, this could be due to the effects of the concurrent financial crisis or to issues with the econometric model. We add to the debate above by providing evidence of a clear effect in Matera's labour market and showing how these effects are not only present in the hospitality sector, but they also reverberate through the culture, building and construction sector.

Finally, this paper contributes to a recent stream of the literature linking the effect of tourism on the housing market. A series of papers, see Horn and Merante (2017) for Boston, Koster *et al.* (2021) for Los Angeles, Garcia-López *et al.* (2020) for Barcelona and Peralta *et al.* (2020) for Lisbon, document a sizeable impact of listings on Airbnb, the renowned house sharing platform, on housing prices and rents, with effects stronger (+15%) in the more touristic areas (Koster *et al.*, 2021). While we do not observe data on the number of Airbnb listings, Picascia, Romano and Teobaldi (2017) highlight how the proportion of housing stock in the historical centre of Matera listed on Airbnb as “entire place” grew from 17.30% to a staggering 25.30% between 2015 and 2016. The 2016 value represents the highest figure across Italian cities and suggests that



a sizable part of the touristic flows might have lodged in accommodation rented through sharing platforms. Our estimates complement these findings by showing an increase in the number of companies working in the real estate sector in the years 2014 and 2015, plus an increase in the number of real estate transactions shortly after. Furthermore, we document a strong yet comparable increase of around +12% in housing prices, mostly driven by residential and commercial units in the historical centre of Matera.

The remainder of this paper is organized as follows. Section 2 describes Matera and the European Capital of Culture event. Section 3 presents the data we collected and Section 4 outlines the empirical strategy. Section 5 presents the main results, Section 6 discusses robustness checks while Section 7 concludes.

2. POLICY CONTEXT

This section describes Matera and the European Capital of Culture policy. It is key to understand the background of the paper and interpret our results.

2.1 Matera: *The City of Stones*

Matera is a municipality and province in the Southern Italian region of Basilicata⁴. The municipality is home to 60,000 inhabitants and heads a province of about 200,000 citizens. Matera is an ancient city, with the first signs of settlements dating back to prehistory (APT Basilicata, 2019). The unique and fascinating landscape of the Sassi (Stones) neighbourhood, made of grottoes carved out of limestone, is a recognized World Heritage Site by UNESCO and strikes a chord with visitors.

Despite its architectural wonders and being today a popular tourist destination, life in Matera, and especially in the Sassi area, has been rough. The sordid living conditions in the Sassi, plagued by poverty, famine and malaria, were first brought to the fore by the 1945 book *Christ Stopped at Eboli* written by Carlo Levi during his exile in Basilicata. In 1948 the leader of the Italian Communist Party, Palmiro Togliatti, labelled the appalling living conditions in the area of the Sassi a “national disgrace” (Catullo, 2020). A 1952 national law started a relocation plan to move out citizens to newly built accommodations in the periphery. Over half of Matera’s population at the time, around 16,000 individuals, was affected by the relocation policy (OpenData Matera, 2019). The Sassi were therefore vacated and laid abandoned for years. The situation only started to change in 1986, when a second law was passed to promote investment in the area and which eventually led to people retaking the Sassi, the nomination to a world Heritage site in 1993 and the shooting of Mel Gibson’s *The Passion of the Christ* in 2004.

⁴ Basilicata hosts two province capitals: Potenza which also serves as capital city of the region and Matera.



Matera's economic hardship however did not fade away. In 2012 Matera's GDP per capita⁵ was 17,500, considerably lower than the Italian average of 26,900 euros and slightly lower than the regional value of 19,900 euros. Likewise the unemployment rate⁶ was 17.42%, far higher than 10.68% for Italy and 14.55% for Basilicata. At the same time, despite the impressive potential for tourism, Matera hosted 1.5 tourists per inhabitant in 2012; this is way less than 6 and 2.83 for other finalist cities such as Siena and Perugia but more than the neighbouring cities of Bari and Cosenza, which hosted 0.52 and 0.85 tourists per inhabitant respectively.

Life in Matera started to change in 2013, when the city was brought to the spotlight after being shortlisted for the 2019 European Capital of Culture, a title officially won in 2014. The shortlisting, and the eventual awarding of the title, brought an enormous media coverage the likes of which Matera had never experienced before. Around 140 international news outlets (radio, newspapers and TVs) across 42 countries covered Matera, with the city even being ranked third in the top 52 travel places by the *NYTimes*⁷ in 2018. Matera also made it to the big screen with about 30 films being shot in the city and surrounding areas since 2014 (Commission *et al.* 2020). National media exposure was massive as well, with more than 6,500 news articles published between 2019 and March 2020. The 2019 inauguration event broadcast by Rai Uno, the flagship channel of national television⁸, reached about 3,883,000 viewers amounting to 20.8% of television share (Matera Basilicata 2019 Foundation, 2021).

2.2 European Capital of Culture

The European Capital of Culture is a EU initiative designed in 1985 by the European Commission (European Commission, 2020b). Its main aim was, and still remains today, to bring EU citizens closer by providing a unique stage to showcase the cultural diversity of the Union, as well as an opportunity to appreciate its common history and values (European Parliament and European Council, 2005). Cities awarded the European Capital of Culture title enjoy a unique occasion to boost their cultural profile worldwide. At the same time, they also grab a chance to regenerate themselves on the longer term, enhancing the prosperity and quality of life of their citizens. Cities awarded the title invest in culture as a road to development expecting returns from the infrastructures they build for the occasion and the touristic inflows.

Since 2005, one or more European Capital of Culture is selected each year among Member States cities. In 2019 Italy and Bulgaria were both asked to recommend one of their cities to host the title. The life-cycle of Matera as a European Capital of Culture⁹ begins six

⁵ Eurostat, NUTS3 figure.

⁶ ISTAT, unemployment rate 15-74 age group NUTS3 figure.

⁷ *52 Places to Go in 2018 NYTimes* (2018).

⁸ Radiotelevisione italiana, the Italian state-owned television network.

⁹ At the time Matera was selected, the selection proceeded according to European Parliament and European Council (2006). However, this has been amended by European Parliament and European Council (2014), currently in effect.

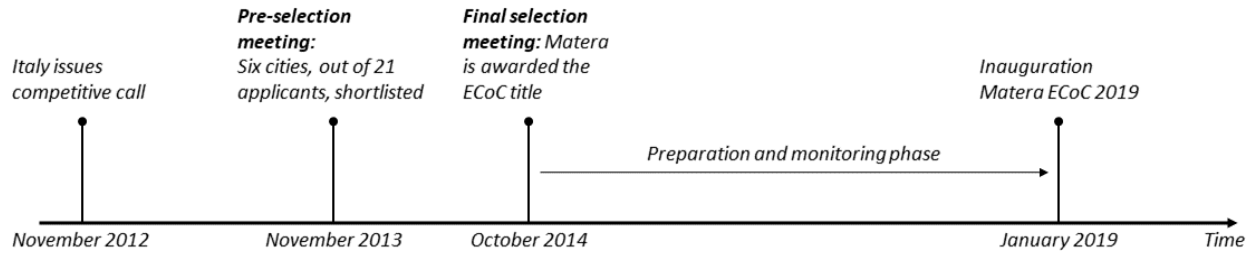


years before the title year, when Italy publishes a call for their cities to bid. During the next two years bidding cities are evaluated by a panel of 13 independent experts, six nominated by Italy and seven by European Institutions (European Parliament and European Council, 2006). A formal nomination of the winning cities takes place four years before the title year. Winning cities remain constantly monitored and advised by the panel and the European Commission while working towards the event year. During the period, local administrations receive both national and European funds and are tasked with urban projects, as well as the organization of the body of cultural events. Overall, the budget for Matera 2019 was composed of 54.8 € million for current expenditure, in addition to the ordinary cultural budget of the city, with 70% of the budget being financed by the Italian central government, 25% by regional and local authorities, and the remaining part by the European Union and private sponsors (European Commission, 2020c). The bidbook for Matera also included an hefty 650 € million budget of capital expenditure with spending items classified as either culture infrastructure, urban revitalization or accessibility infrastructure. Despite the colossal resources, which might cast concerns on what is driving our estimates, we show in Table A.1 in the [online Appendix](#) how the proposed Capital of Culture budget and bidbook included project which were already planned in Matera. Indeed, several key infrastructure projects already were either under construction during the bidding period, agreed upon a long time before or, to the best of our knowledge, never implemented. We also retrieved bidbooks for all six 2019 Italian ECoC finalist cities to provide suggestive evidence of how cities populated the budget section of their bidbooks with infrastructure spending already planned, even if unrelated to the European Capital of Culture event. This comparison is also reassuring as it suggests Matera was not unique in large capital expenditure and that similar resources might have been invested in finalist cities or cities in our control groups for which we do not observe bidbooks.

Not surprisingly, the selection process is usually highly competitive and it has been particularly so in the case of the 2019 title in Italy (European Commission, 2020b). Twenty-one candidate cities responded by submitting a bid. The selection panel eventually recommended the Italian government to shortlist six candidate cities to the final selection stage. The six finalists were Cagliari, Lecce, Matera, Perugia, Ravenna, and Siena. The final selection took place during a final meeting, when the panel voted 7 to 6 in favour of Matera. Figure 1 summarizes the key selection steps that led to awarding the title.

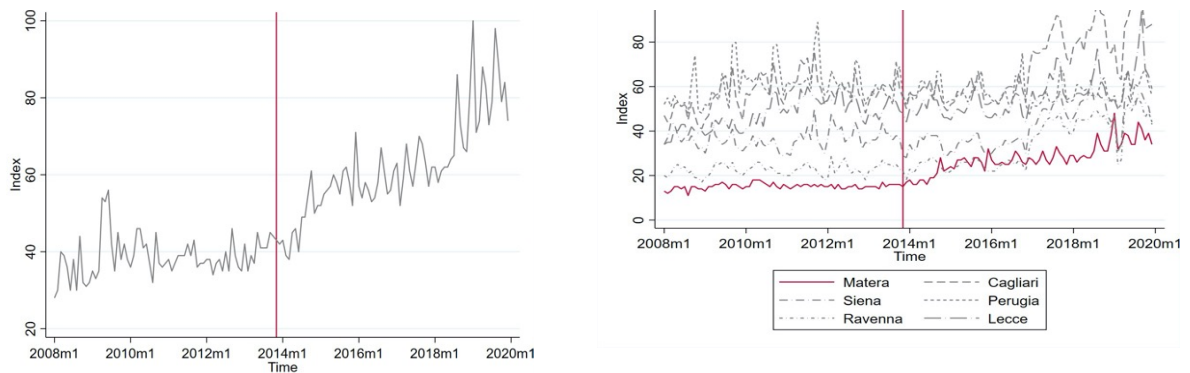


FIGURE 1 • SHORTLISTING PROCESS



As Matera was shortlisted in November 2013, gaining immediate national interest, we set 2013 as the year of treatment¹⁰. Indeed, descriptive evidence shows how tourism and interest in Matera started to increase since the shortlisting date. Likewise, Figure 2a shows how Google searches¹¹ for Matera began increasing around the end of 2013, with peak interest reached at the inauguration of the event year in early 2019. Moreover, Figure 2b shows how this hike in media attention only applies to Matera and not to other finalist cities, a point on which we return in Section 6. Lastly, the presence of, and interest towards, Matera on social networks boomed during the ECoC competition. Indeed, the day of the shortlisting saw the hashtag supporting Matera's bid as 2019 European Capital of Culture as trend topic on Italian Twitter (Matera 2019 Committee, 2021). Interest in Matera steadily rose and peaked in the European Capital of Culture year, during which more than 1,300 events were implemented, along with two flagship projects, four thematic exhibitions and 40 international meetings. Over 140,000 tickets were sold, while free events reached about 350,000 individuals (European Commission, 2020c).

FIGURE 2 • MEDIA ATTENTION



(a) Google searches for "Matera"

(b) Google searches for finalist cities

¹⁰ This happens in outcomes for which we have yearly data. When higher frequency data are available, we set treatment as close as possible to November 2013, i.e. the second semester or last quarter of 2013.

¹¹ Data for Google Searches refers to an index peaking at 100 for the most searched term. Values for all other terms are scaled compared to the most search item.



The project which led to Matera 2019 envisioned an engagement of the whole region of Basilicata in the title. Indeed, although Matera has been venue for the majority of the events, about one third of the activities brought to life during the European Capital of Culture year took place in a Basilicata municipality different from Matera, either as supporting venue or as primary location (Matera Basilicata 2019 Foundation, 2021). Hence, our analysis will concentrate on the provincial level, eventually zooming into the city of Matera whenever data allows. For the same reason, we consider the province and city of Potenza, the largest city in the region and host of several events, as partially treated, and thus exclude it from the control group of the main specification.

3. DATA

We collect data on touristic flows and accommodations, unemployment rate, resident firms and staff by sector, population, income declared for tax purposes, real estate transactions and average sell price. Our data sources include the Italian Statistical Agency (ISTAT), the Italian Ministry of Economy and Finance (MEF) and OMI (Osservatorio del Mercato Immobiliare), the housing statistics body of the Italian Revenues Agency¹². Table 1 describes, for each outcome variable, time span availability, frequency, source and observation level. Overall, we work with an unbalanced panel of 30 provinces (or province capitals) of yearly (or higher frequency, whenever available) data from 2008 until 2019.

We standardize several variables to ease the comparability of the results when performing permutation inference, as discussed in Section 4. We standardize the number of tourists checking in, the number of nights they spent, the number of accommodation facilities, the number of firms and workers for each ATECO 3 digits code¹³, the number of OMI transactions and income reported for tax purposes by thousand inhabitants of each province in 2009. For the housing market, we work with average sell price by areas, i.e. collection of neighbourhoods equally distant from the city centre, and building category.

Across all data sources, we remove observations for provinces which were created, suppressed or modified during our study period or where there was no single municipality serving as province capital¹⁴. The control group in the main specification is made of all provinces (or province capitals, depending on the unit of observation in the data) in Southern Italy, excluding the provinces of Potenza and Lecce. We exclude the former as it was a secondary host for some events during the ECoC year, as we discuss in Section 2.2, and the latter to avoid contaminat-

¹² Agenzia delle Entrate.

¹³ ATECO (Classification of Economic Activity) 2007 codes are used to define industry sectors and relative description, as per Italian Statistical Agency's national version of European nomenclature.

¹⁴ We excluded the following provinces: Verbano-Cusio-Ossola, Monza e della Brianza, Pesaro e Urbino, Fermo, Massa-Carrara, Barletta-Andria-Trani and the island of Sardinia.



ing our estimates with spotlight effects on finalist cities¹⁵. Figure A.1 in the [online Appendix](#) summarizes the geographical coverage of the data and of the control group we use for the main specification. Table A.3 presents descriptive statistics, while Section A.1 in the [online Appendix](#) details data structure and cleaning.

TABLE 1 • DATA SOURCES

<i>Variable</i>	<i>Time span</i>	<i>Frequency</i>	<i>Sources</i>	<i>Observation level</i>
Touristic flows and accommodations	2008 - 2019	Yearly	ISTAT	NUTS3
Unemployment rate	2008 - 2019	Yearly	ISTAT	NUTS3
Resident firms and staff (by ATECO)	2008 - 2018	Yearly	ISTAT	NUTS3
Population	2008 - 2019	Yearly	ISTAT	NUTS3
Income declared for tax purposes	2008 - 2019	Yearly	MEF	City head of province
Housing transactions	2011 - 2019	Quarterly	OMI	City head of province
Housing prices	2008 - 2019	Biannual	OMI	LAU* and lower**

* Local administrative units, according to the European Union's Nomenclature of Territorial Units for Statistics.

** Area, i.e. collection of neighbourhoods, and building category.

4. IDENTIFICATION STRATEGY

This paper aims at identifying the impact of hosting the European Capital of Culture on income, labour and housing market outcomes by exploiting exogenous variation arising from Matera's shortlisting in 2013. We leverage on event study regressions where we compute dynamic treatment effects, one for each year after shortlisting, by contrasting changes in outcomes for Matera over time with changes in control cities. The choice of following an event study framework is particularly relevant given that we expect dynamic treatment effects to build up over time until 2019, when the event took place. Our main specification is described in Equation 1 below:

$$Y_{pt} = \beta_0 + \sum_{\substack{\tau=2008 \\ \tau \neq 2012}}^{2019} \beta_{\tau} MT_{p\tau} + \delta_p + \gamma_t + \epsilon_{pt} \quad (1)$$

where Y_{pt} is the outcome of interest for province p at time t , $MT_{p\tau}$ is a dummy equal to 1 for Matera in year τ and zero otherwise. We control for province and time fixed effects while ϵ_{pt} is the error term. When analyzing tax data, p is set to indicate province capital city, i.e. the level of observation for these outcomes.

¹⁵ Results remain qualitatively similar when including these provinces as show in Section 6



We slightly modify Equation 1 into Equation 2 to fit higher frequency, quarterly housing transaction data, as in our real estate data. Here the unit of observation is the province capital city c , while we continue to indicate year with t for consistency.

$$Y_{cqt} = \beta_0 + \sum_{\substack{\tau=2011q1 \\ \tau \neq 2013q3}}^{2019q4} \beta_{\tau} MT_{c\tau} + \delta_c + \gamma_{tq} + \rho_{cqt} \quad (2)$$

where Y_{cqt} is the number of housing transactions in province capital city c , in quarter q and year t and we control for province capital, year by quarter time fixed effects.

Finally, the granularity in the housing market data allows us to leverage on variability across building categories, in different neighbourhoods, across city-by-semester cells. To ensure comparability, we again limit our analysis to towns which host province capitals, such as Matera. First, we run a city-wise analysis of housing market prices, adding detailed city-by-area-by-building-category fixed effects. We then explore heterogeneous effects on progressively finer real estate markets: we look at the area level, i.e. a collection of neighbourhoods equally distant from the city centre, and finally at a set of building categories within an area. In Equation 3, we define each market m and control for market fixed effects. This allows us to progressively zoom in when estimating β^m coefficients, with market m indicating building category by area within a city, area within a city, then city-wise fixed effects:

$$Y_{mst} = \beta_0 + \sum_{\substack{\tau=2008s1 \\ \tau \neq 2013s1}}^{2019s2} \beta_{\tau}^m MT_{p\tau} + \delta_m + \gamma_{ts} + \eta_s + \phi_{mst} \quad (3)$$

where δ_m are market fixed effects, and m indicates: city-wise p , area within a city pa , and finally building category within an area pac real estate market. γ_{ts} are year by semester time fixed effects.

Identification is contingent on the parallel trend assumption, according to which, in absence of treatment, outcomes for treated and control units would have evolved along a parallel path. While the assumption cannot be tested, lead treatment effects (β_{τ} associated with lagged treatment variables) are commonly deployed to provide evidence of similar trends prior the introduction of the policy and hence serve as a falsification test.

We investigate alternative specifications which relax this assumption as a robustness check (Angrist and Pischke, 2008). To do so we estimate a Difference-in-Differences regression (DiD) where we first allow for unit specific time trends and then for linear and quadratic unit specific time trends whenever lead coefficients seem to suggest quadratic pre-trends. In both cases we follow Wolfers (2006) imposing minimal structure on the dynamic treatment effects to avoid confounding coefficients from DiD models with time trends. This amounts to estimating the specifications below, with and without imposing $\delta_{2p} = 0$:



$$Y_{pt} = \beta_0 + \sum_{\tau=2013}^{2019} \beta_{\tau} MT_{p\tau} + \gamma_t + \delta_{1p}t + \delta_{2p}t^2 + \rho_{pt} \quad (4)$$

We run similar specifications on data with different granularity with estimating equations available in the [online Appendix](#).

The control group for all equations in our main specification is composed of provinces or province capitals, depending on the dataset, in Southern Italy. We exclude Potenza and Lecce as outlined in Section 3. Section 6 shows that our results remain qualitatively similar when dropping neighbouring provinces or when contrasting Matera with provinces from the whole country.

When we turn to significance, Bertrand *et al.* (2004) show how standard errors in DiD models are likely to be underestimated, especially when working with outcomes that are potentially serially correlated, such as labour market indicators. The common solution to the problem is to compute standard errors by using the clustering framework. Nevertheless, the number of treated clusters matters when drawing statistical inference, as shown by MacKinnon and Webb (2017). Drawing inference is notoriously difficult in settings where there is only a few treated clusters, with over rejection rates as high as 80% (MacKinnon and Webb, 2017). Moreover, canonical standard errors might not provide an accurate measure of design-based uncertainty (Abadie *et al.*, 2020). This is the type of uncertainty that we are interested in: we are not working with samples and our main source of uncertainty stems from the fact that we do not observe the counterfactual outcome for the treatment unit. Finally, relying on standard errors, usually derived from large sample properties where the number of units approaches infinity, might be even more inappropriate in this paper as we focus on a single treatment unit (Cunningham, 2021).

For this reason we follow Buchmueller *et al.* (2011) in drawing inference from permutation tests where we drop Matera, reassign treatment to each unit in the control group and compute a distribution of placebo treatment effects. We then augment this distribution with effects found for Matera and compute exact p-values (Heß, 2017). We apply permutation tests across all specifications. An alternative identification strategy would leverage on Synthetic Control Method (Abadie and Gardeazabal, 2003). This methodology would however require even longer time series that might be difficult to collate or of limited comparability because of breaks due to changes in definitions affecting relevant variables in our setting.

5. RESULTS

In this section we present and discuss empirical results from our main specification. Our figures combine coefficients for Matera, in red, together with results from permutations, shown in grey, to draw statistical significance. The grey bar for each coefficient reports the range of estimates between the 5th and the 95th percentiles of the placebo distribution. This allows claiming sta-



tistical significance, at 10%, whenever the coefficient for Matera lies outside the grey area. We report exact point estimates and p-values computed following Heß (2017) in Tables A.5 and Table A.6 in the [online Appendix](#).

Importantly, our event study specification enables us to track the pattern of effects over time. This is useful both to gauge the presence of parallel trends prior to the event, by looking at coefficients for lead effects, and to assess how impacts evolve over time. The lead coefficients paint a reassuring picture, providing supporting evidence towards parallel trends for most outcomes. Moreover, we examine more into detail the few outcomes for which this is not the case in Section 6. The post-treatment coefficients, on the other hand, are consistent with the idea of Matera being slowly brought into the spotlight and into touristic routes thanks to the shortlisting and nomination as European Capital of Culture.

Figure 3 shows results for our main specification, Equation 1, on the effect of being shortlisted, and subsequently winning, the European Capital of Culture title on our set of outcome variables for tourism. Our estimates point towards a strong and statistically significant increase across all measures of touristic activities since shortlisting in 2013. We show an increase in hotel clients growing over time and peaking at +1,723 check-ins per thousand inhabitants in 2019. Similarly, figure 3b shows an increase in overnight stays, pointing, in 2019, to 3,390 more nights spent in the city per thousand inhabitants. The number of accommodation facilities also increases by 2.76 establishments per thousand inhabitants as in figure 3c. The magnitude of these effects can be appreciated by rescaling coefficients to the population of Matera in 2009 revealing +346,000 check-ins, nearly a 115% increase from the pre-treatment level of 302,000 clients in 2012, +681,000 overall nights, or +52% compared to 1,314,000 in 2012 and +542 facilities versus 299 establishments in 2012.

Remarkably, our estimates also point towards strong effects prior to 2019, when most exhibitions and cultural events had not taken place yet, and can be reconciled with a spotlight effect stemming from the massive media exposure Matera enjoyed since being shortlisted. This result is also suggestive that our effects are not utterly dependant on the cultural initiatives that have taken place in 2019 but could also indicate a robust touristic rediscovery of Matera that is likely to persist to some degree after 2019.

Figure 4 investigates the effect on income declared for tax purposes, expressed in thousand euros per thousand inhabitants in the province. This is found to increase in 2019 with +354 thousands euros per thousand inhabitants or +71,116 thousands euros, revealing an increase of +9.7% compared to the pre-treatment values of 734,308 thousands euros in 2012. Figure 4 also plots impacts on the labour market, revealing a deep reduction in the unemployment rate which seem to be stronger for men. In particular, our estimates provide evidence of a drop over time with the largest effect in 2019, corresponding to a reduction of 7.74 percentage points.

We explore these effects in more detail by investigating the number of firms and workers through a fine granular classification (ATECO 3 digits codes) in Figure 5. For each sector, shown on a different panel of Figure 5, we report estimated coefficients for the number of firms (left) and the number of workers (right). Given that cultural events are the backbone of the European Capital of Culture initiative, it is reassuring to find an increase in Matera's cultural sector, both



in the number of firms, peaking early on at +0.015 firms per thousands inhabitants, or 3 additional firms (+33%), in 2016 and workers, closer in time to the event and up to +0.25 workers per thousand inhabitants, or 50 individuals in 2019 (+277%). Consistently with the evidence on tourism flows, we find an increase in the number of firms and workers in sectors closely related to the hospitality industry. In particular, firms in the hotel and catering sectors peak early on around 2015, with an increase of 0.06 and 0.03 firms per thousand inhabitants, or 12 (29%) and 6 (100%) firms respectively. On the other hand, firms in short-stay accommodation and reservation services, which encompass touristic guides, seem to experience growth closer to the event year, the former showing an increase of 0.49 firms per thousand inhabitants, or 98 (+193%) overall, the latter of 0.11 firms per thousand inhabitants, or 22 firms (+106%) overall. Workforce-wise, we see an increase in the number of workers in hotels (+1.05 per thousands inhabitants, or 210 individuals overall, +55%) and restaurants (+1.68 per thousand inhabitants, or 338 individuals overall, +24%). Overall, we find evidence of a positive effect on sectors related to cultural touristic flows which are likely to be attracted by the European Capital of Culture event.

We find similar evidence for sectors that are likely to have benefited from the boost in infrastructure spending associated with the event as we discuss in Section 2.2, especially on the workforce side. Overall, workers in demolition, construction activities and architectural and engineering activities appear to have increased the most with +0.41, or 82 individuals at its peak in 2017 (+49%), +0.90, or 175 individuals (+106%), and +1.64, or 330 individuals (+43%), respectively in 2019.

The timing of the effects depends on the specific sector, with infrastructure-related industries such as construction, engineering and real estate peaking in the preparatory years (i.e., between shortlisting and the actual event year) while culture, restaurants and short-stay accommodation, more heavily dependent on the event itself, reach their peak closer to 2019. Interestingly, we observe a double peak in sectors related to tourism in a traditional sense: hotels and reservation services (i.e., touristic guides) show a local maximum around 2015, the year after Matera is awarded the title, and then a second increase up to the highest value in the event year. We take this as supporting evidence towards the spotlight effect we outlined above.

Lastly, we turn to the real estate market. We report an increase in the number of firms active in real estate trading, up to +0.08 per thousands inhabitants in 2015, or 16 additional firms (+30%). The timing of these effects matches evidence from the number of transactions in real estate, which increases around the same time, as we show in Figure 6. Similarly, an increase in sell price for the housing market is visible beginning in 2016.

More into detail, Figure 6a shows the effect of the ECoC title on the number of real estate transactions standardized to 2009 inhabitants. Consistently with our analysis by ATECO sectors, our estimates point towards an increase starting from early 2015, peaking in late 2017 to +0.74 per thousands inhabitants, or 148 additional transactions. This is equivalent to a 172% increase in 2017 once compared to the pre-treatment value of 86.1 transactions in the third quarter of 2013.

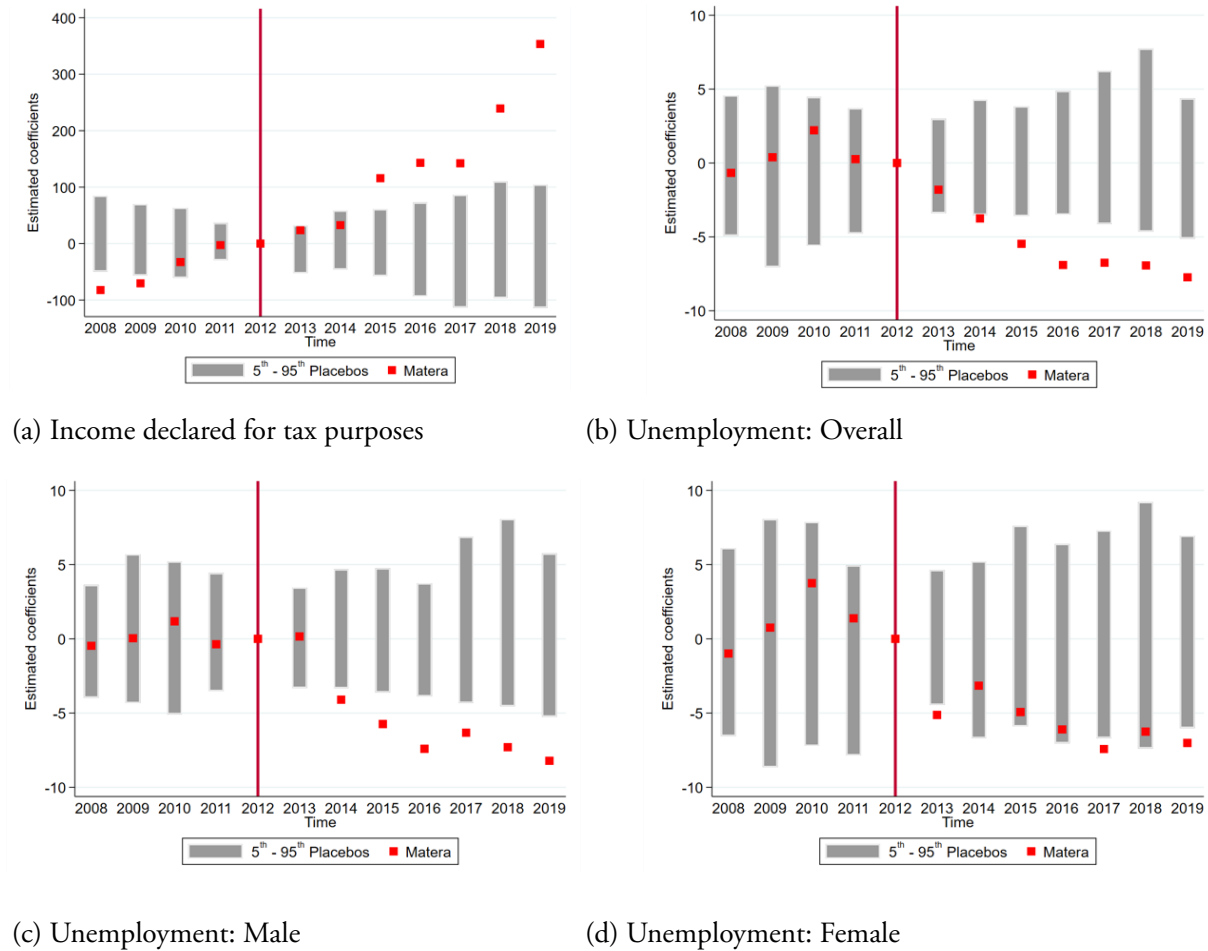
The rise in the number of transactions translates into an increase in average sell prices (euro per square meters). Figure 6b shows a generalized, i.e. across all areas and building categories in



Matera, increase in prices following the ECoC shortlisting and nomination, building up and becoming statistically significant as we approach the event year. According to our estimates, the average increase amounts at +155 €/m² from a pre-treatment level of 1,183 €/m², or +13%. As detailed in Section 3, the housing market data allows for an in-depth analysis within a city's real estate markets, namely areas, i.e. collections of neighbourhoods grouped according to the distance to the city centre, and building category, such as residential buildings, retail or office space. Moreover, given the availability of biannual data, our analysis can also dig deeper in the timing of the effects. As Matera was shortlisted in November 2013, we consider the second semester of 2013 as the first period to be treated when analyzing the real estate market. Panel A of Figure 6 investigates the previous result in more detail, by looking at average sell prices in the city centre and in areas immediately close to the city centre (right figure). Our estimates show an increase slightly under 344 €/m² for properties in the city centre and of 147 €/m² for buildings located immediately close to the city centre, up from a pre-treatment level of 1,444 and 1,151 €/m² respectively, in the first semester of 2013. Panel B and C break these results further by investigating prices for different types of buildings in the- and close to- the city centre. Our estimates show how the effects for the city centre can be traced back to a boom in prices for residential units and, to a somewhat lesser extent, low cost residential units (+356 €/m², or +25%), retail space (+856 €/m², or +30%) and office space (+408 €/m², or +38%). Indeed, residential units in Matera's city centre appreciate by 733 €/m², which amounts to +43% from 1,712.5 €/m² in the first semester of 2013. When looking at the real estate market close to, but not in, the city centre, instead, we find an increase in prices only for housing units, both normal and low cost, and no evidence of an effect for office and retail space. The increase in average sell price is nonetheless substantial for low cost residential units, reaching +457 €/m², up from a 1,225 €/m² pre-treatment level. Overall, our results are consistent with a tourism-driven increase in transactions and prices. Indeed, Picascia, Romano and Teobaldi (2017) estimate that a staggering 25% of the entire housing stock in the historical centre of Matera was listed on Airbnb as "entire place" in 2016. As the number of residential units in both the historical centre and the traditional area of Sassi is fixed, the pressure of visitors inflows is likely to have played a role in the dynamics of the housing market. Moreover, we find no evidence of an effect as we move further away from the historical city centre or as we analyze building categories unrelated to tourism, such as industrial buildings and warehouses. Said building categories and areas do not experience an appreciation, and are thus the reason for the average city-wise increase in sell prices lying lower than the increase we found for the city centre or for specific building categories.



FIGURE 4 • TAXABLE INCOME AND UNEMPLOYMENT



Notes: The figure shows estimated coefficients for Matera, in red, and results from permutations, in grey. The grey bar for each coefficient reports the range of estimates between the 5th and the 95th percentiles of the placebo distribution. This allows claiming statistical significance, at 10%, whenever the coefficient for Matera lies outside the grey area. We signal with a magenta vertical line pre-treatment year 2012, i.e. the year immediately before Matera's shortlisting in 2013.



FIGURE 5 • NUMBER OF FIRMS (LEFT) AND WORKERS (RIGHT) BY ATECO SECTOR

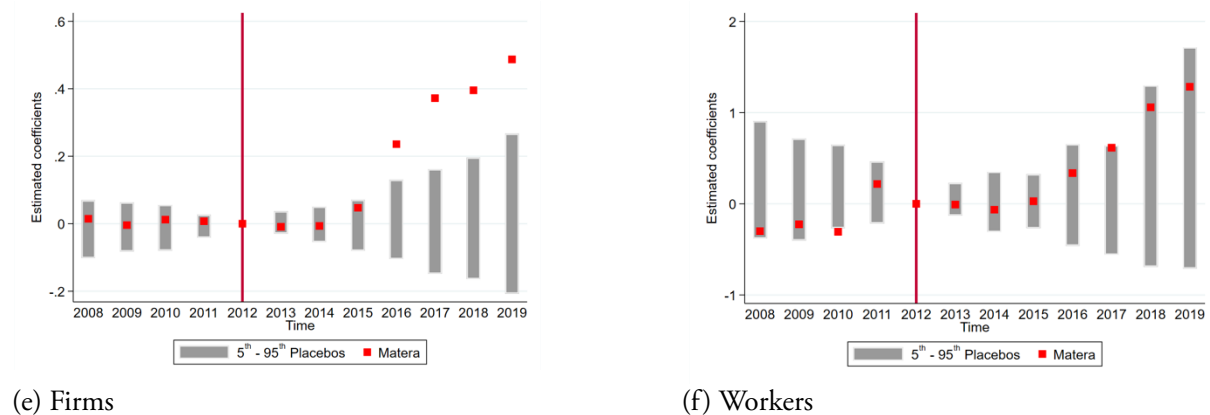
Panel A: Libraries, archives, museums and other cultural activities



Panel B: Hotels and similar accommodation

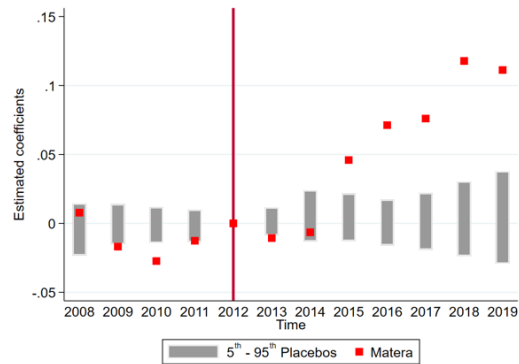


Panel C: Holiday and other short-stay accommodation

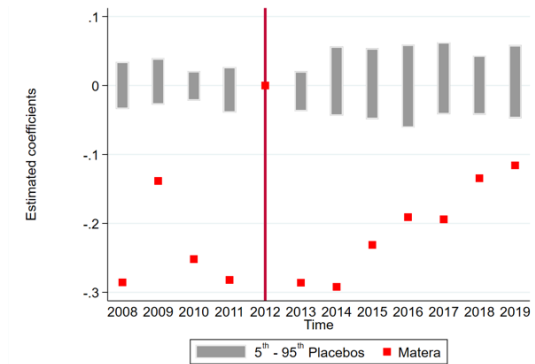




Panel D: Other reservation service and related activities

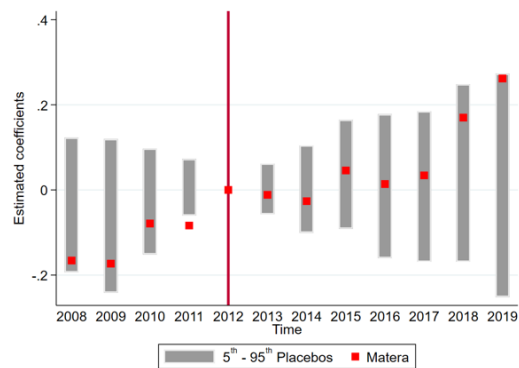


(g) Firms

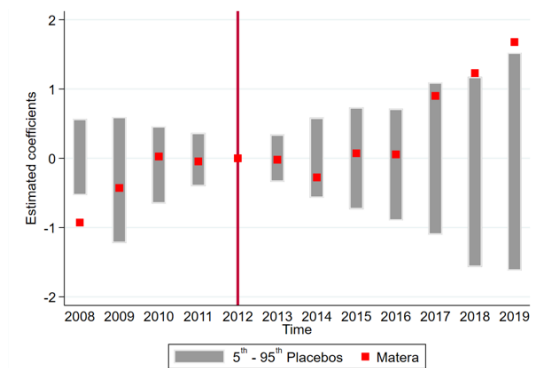


(h) Workers

Panel E: Restaurants and mobile food service activities

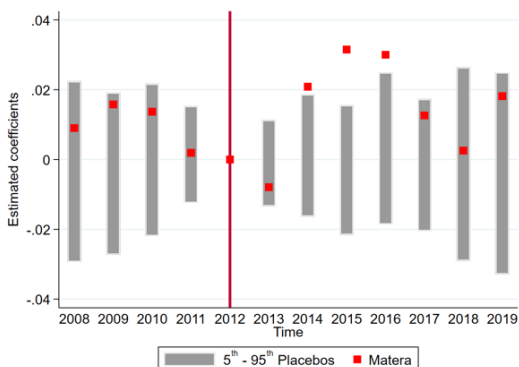


(i) Firms

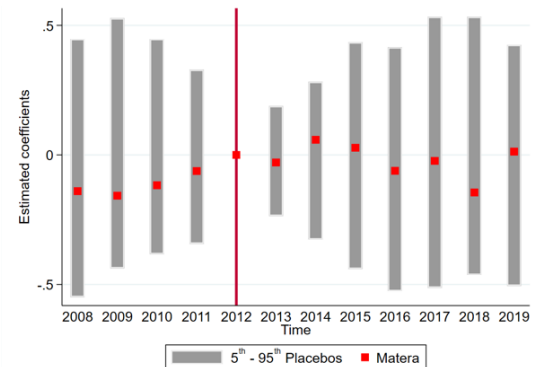


(j) Workers

Panel F: Event catering and other food service



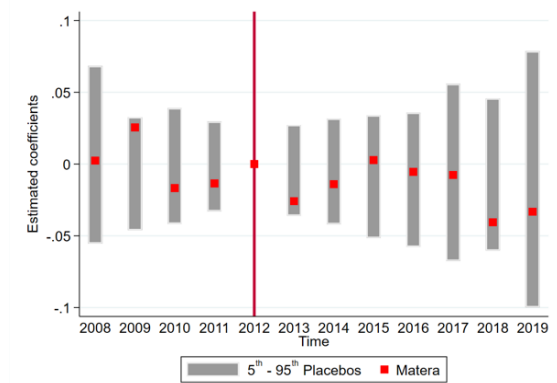
(k) Firms



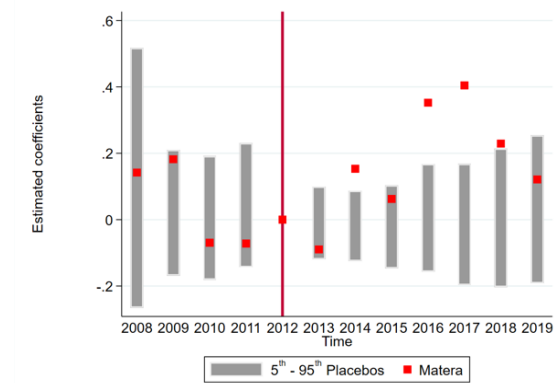
(l) Workers



Panel G: Demolition and site preparation

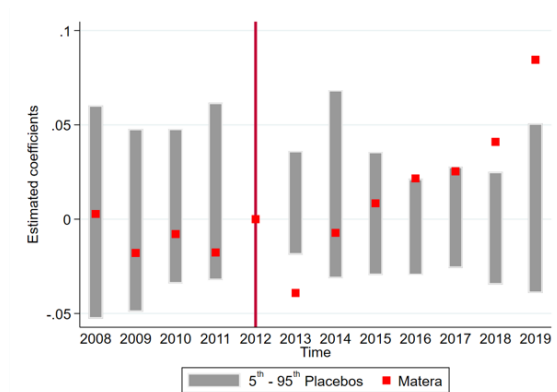


(m) Firms

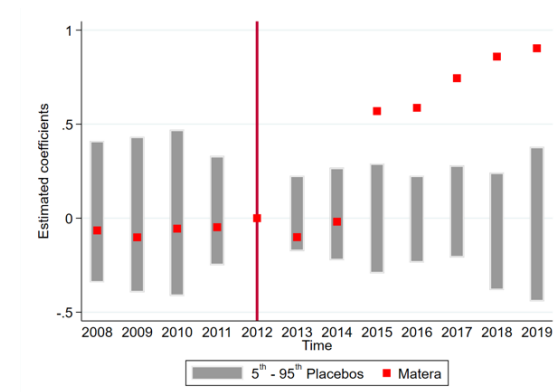


(n) Workers

Panel H: Other specialised construction activities

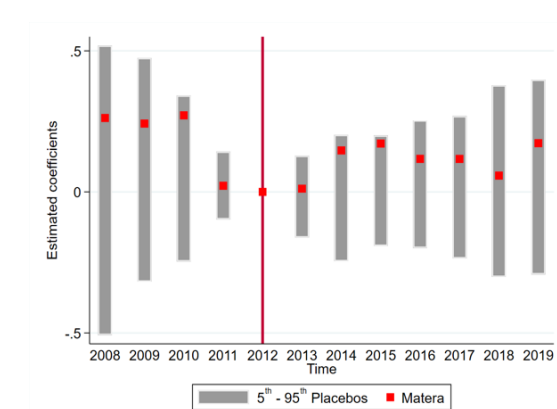


(o) Firms

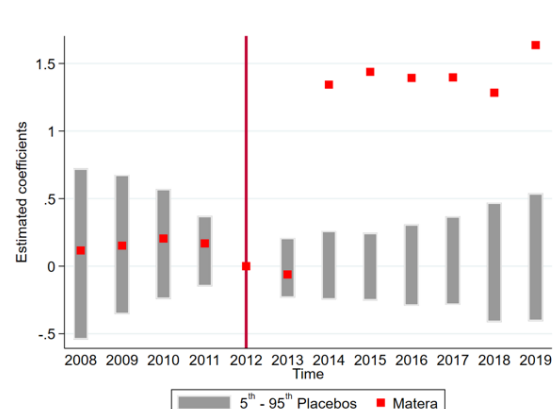


(p) Workers

Panel I: Architectural and engineering activities and related technical consultancy



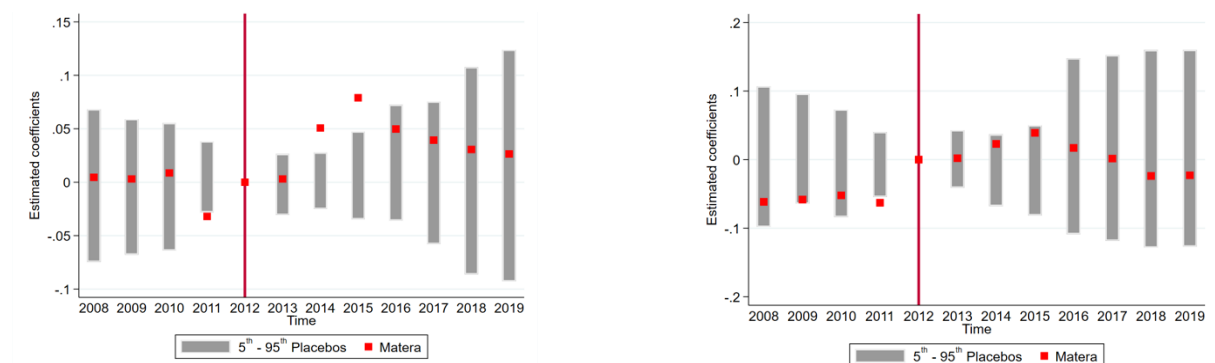
(q) Firms



(r) Workers



Panel J: Real estate activities on a fee or contract basis



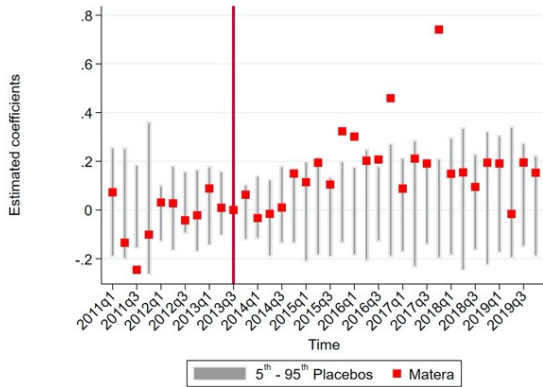
(s) Firms

(t) Workers

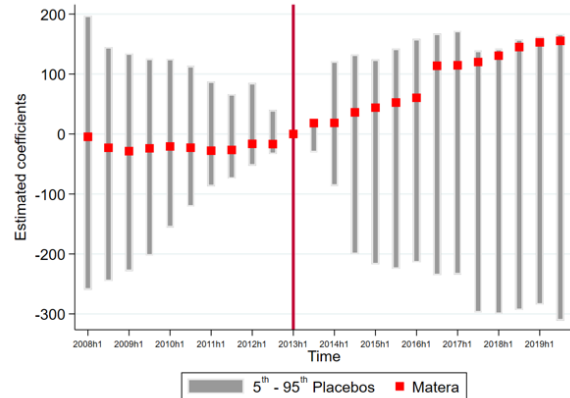
Notes: The figure shows estimated coefficients for Matera, in red, and results from permutations, in grey. The grey bar for each coefficient reports the range of estimates between the 5th and the 95th percentiles of the placebo distribution. This allows claiming statistical significance, at 10%, whenever the coefficient for Matera lies outside the grey area. We signal with a magenta vertical line pre-treatment year 2012, i.e. the year immediately before Matera's shortlisting in 2013. Outcome variables are standardized per thousand inhabitants.



FIGURE 6 • HOUSING MARKET

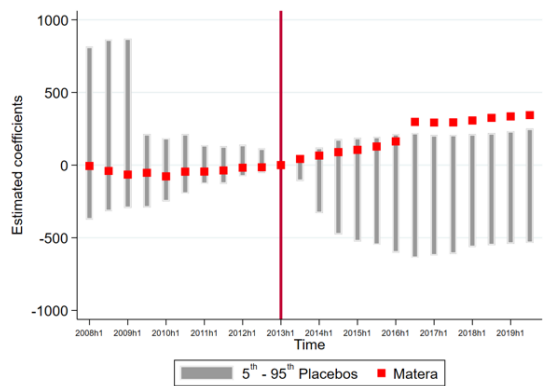


(a) Overall transactions

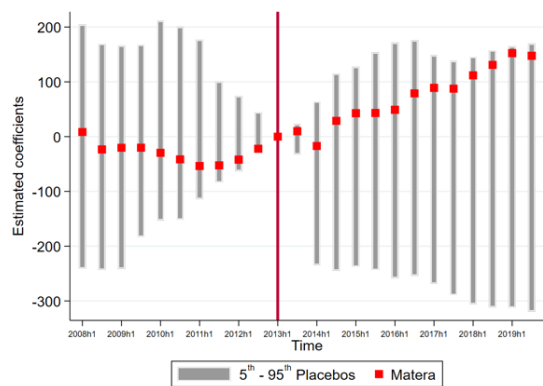


(b) Sell price: Overall

Panel A: Sell price, by areas

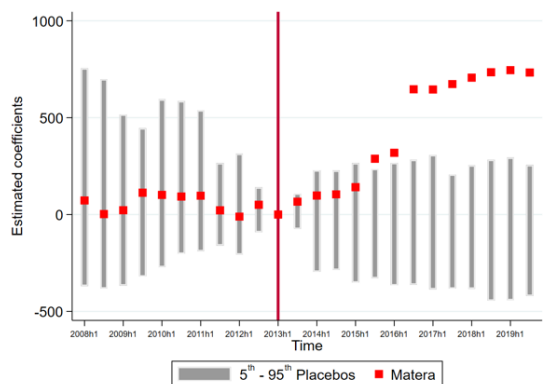


(c) City centre area

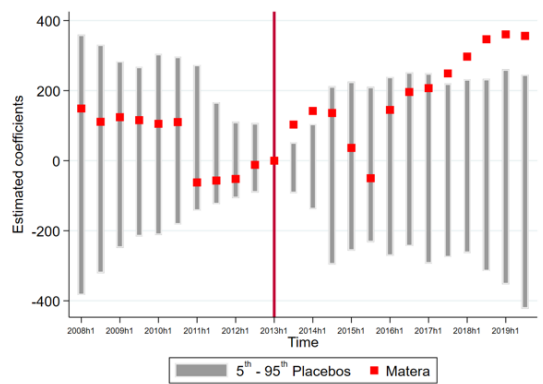


(d) Close to the city centre area

Panel B: City centre, sell price by building category



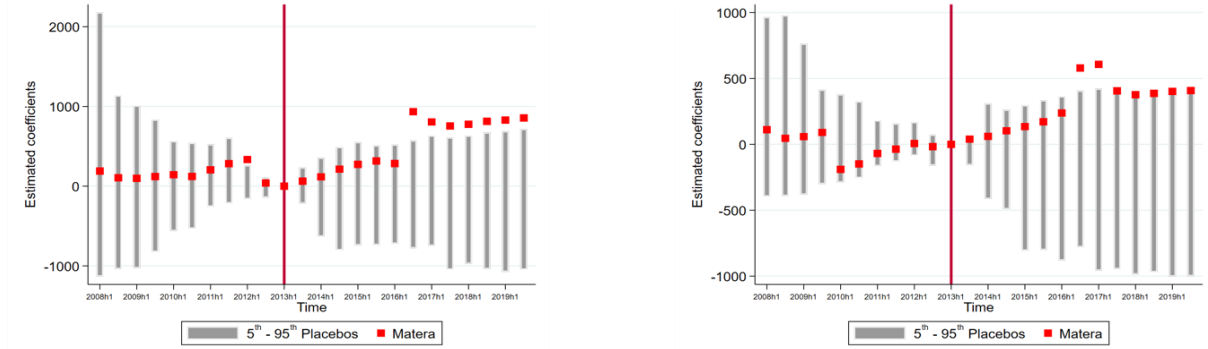
(e) Residential units



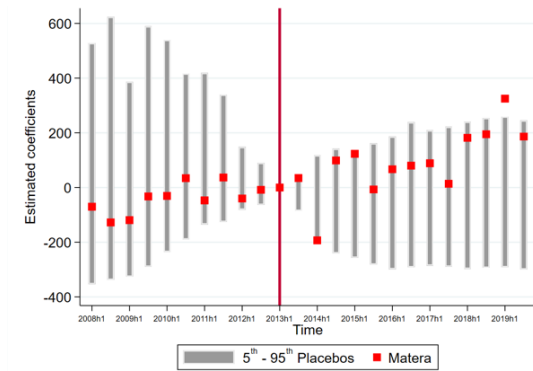
(f) Low cost residential units



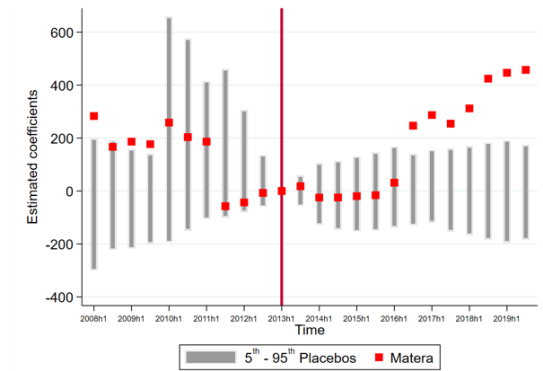
Panel C: Close to the city centre, sell price by building category



(g) Retail space



(h) Office space



(i) Residential units

(j) Low cost residential units

Notes: The figure shows estimated coefficients for Matera, in red, and results from permutations, in grey. The grey bar for each coefficient reports the range of estimates between the 5th and the 95th percentiles of the placebo distribution. This allows claiming statistical significance, at 10%, whenever the coefficient for Matera lies outside the grey area. We signal with a magenta vertical line pre-treatment year 2012, i.e. the year immediately before Matera's shortlisting in 2013. Outcome variables are standardized per thousands inhabitants.

6. ROBUSTNESS CHECKS

Table A.5 and Table A.6 in the [online Appendix](#) report a set of robustness checks. As discussed above in Section 4, the main identification assumption behind our event study specifications requires parallel trends in the potential outcomes of the dependent variable. While the assumption cannot be tested, we report coefficients associated with lead effects in the results for our main specification above. For most outcomes these coefficients are small and not statistically significant, suggesting that the parallel trend assumption is likely to hold. For other outcomes,



instead, they seem to point to a violation of the assumption. This appears to be particularly relevant for hotel clients (Figure 3a), taxable income (Figure 4a), ATECO sectors such as reservation services and restaurants (Figures 5g and 5i), low cost residential units close to the city centre (Figure 6j) and, to a minor extent, also for unemployment as in Figure 4b. To tackle these concerns we re-run our main specification adding province-specific linear time trends. Quadratic province-specific time trends are added when the estimation results from the main specification hints to the presence of a quadratic pre-trend, i.e. unemployment indicators and firms in reservation services sector. Table A.5 for our economic outcomes and Table A.6 for the housing market show results for the main specification and once we add time trends. We show one sided exact p-values from permutation tests to gauge statistical significance. Overall, our results appear robust to these corrections, as estimated coefficients appear fundamentally stable.

In an additional robustness check we also show that our results are qualitatively similar when we modify the control group as shown in Figure A.1. First, we exclude provinces bordering Matera from the control group used in the main analysis, as spillover effects could be in place. Secondly, we include in the control group all provinces in the country, thus moving away from a Southern perspective. Finally, we construct a control group composed of provinces which were shortlisted as finalists for the 2019 European Capital of Culture title alongside Matera. Results stemming from considering finalist provinces as control group should however be taken with caution for two reasons. First, finalist cities already were, unlike Matera, renown attractions and not new to media attention as we show in Figure 2b. This observation, together with the very limited sample size of a control group built on four provinces, make our assumption of parallel trends unlikely to hold in this specific instance. Secondly, all non-winning finalist cities were awarded Italian Capital of Culture (ICC) title in 2015. The ICC title, newly-created and closely related to the European Capital of Culture initiative, can be thought of as a smaller version of the European counterpart in both means and effects. All in all, Figures A.2 through A.5b contrast our original estimates with those obtained by changing the control group and show how results remain again stable across all outcomes. The only exception often being the finalist control group, for reasons outlined above.

Lastly, we provide evidence in favour of our assumption of treatment starting with the 2013 ECoC shortlisting of Matera. Indeed, one could argue that the preliminary work put in place to ensure the city was ready to submit a bid for the title might distort our results. While the coefficients on the lead effects throughout our event study specifications do not suggest strong evidence of this, in a final robustness check we force the treatment date to 2011, when the first committee supporting Matera's interest in the 2019 ECoC title was set up (Matera Basilicata 2019 Foundation, 2021). Figure A.6 through A.9b in the [online Appendix](#) show that our overall conclusions remain qualitatively similar.



7. CONCLUSIONS

We investigate the causal link between hosting a mega cultural event, tourism and economic development. In particular, we estimate the impact of being shortlisted for, and subsequently winning, the European Capital of Culture title for Matera, a previously not-so-touristic city. We find a boost in touristic presence, with check-ins and number of nights spent by tourists increasing by 115% and 52%, respectively. The local economy benefits from this growth in tourism, with a 7.74 percentage points decrease in the unemployment rate and a 9.7% increase in taxable income. Furthermore, we find evidence of an increase in economic activity in tourism-related industries and in value and transactions in the housing market.

We document heterogeneous effects in time, with the estimated positive effects for the local economy slowly yet steadily increasing and building up from shortlisting to the event year. Such a pattern is compatible with a spotlight effect: Matera's showcase as a finalist led to tourists rediscovering its cultural endowment even before hosting the event or winning the title. We present inference drawn from permutation tests. After estimating treatment effect for Matera, we reassign treatment to each unit in the control group. Exact p-values are computed augmenting the distribution of placebo treatment effects with effects found for Matera. This provides for inference which does not suffer from a downward bias in clustered standard errors due to there only being one treated cluster. Finally, focusing on one specific event allows us to have a clear measure of treatment through sound methodology and numerous potential outcomes, with little risk of other events concurring in treatment. Matera allows us to circumvent the general difficulty in combining credible identification strategy and a large, general setting which is often found in similar scenarios.

Adding to the tourism-led growth hypothesis literature, we provide new evidence on the positive causal link between the European Capital of Culture title and the local labour market. Our results also show how said positive effects are not limited to the tourism industry, but spill over to the culture and construction sectors. Similarly, our estimates speak to the stream of literature studying the relationship between tourism and the housing market. We show how a mega event is successful in increasing the number of transactions, the number of companies working in real estate and the average sell price for properties in or close to the historical city centre.

All in all, we find that the European Capital of Culture event was successful in spurring cultural regeneration and economic development for Matera, true to the goals set by the European Commission. Our findings suggest that the European Capital of Culture event could be a viable way for culturally endowed yet underrated destinations to showcase their attractions. An increase in tourism and overall economic development could then follow, even before the onset of the event, through what we call the spotlight effect. The same rationale could be applied to similar cultural events showcasing an area's beauties, such as recent national Capital of Culture initiatives. Generalizability of our results is however limited, as the spotlight effect is unlikely to apply to already well-known localities, however culturally rich.



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