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A Beam of Light: Media, Tourism & Economic Development

Abstract

Tourism accounts for around one tenth of global GDP. We analyze the impact of entertainment media in drawing tourists to filming locations (media multiplier) and, in turn, the effect of tourism on local economic development (tourism multiplier). To assess the media multiplier, we employ a triple-difference empirical strategy exploiting the staggered international release across the EU of Inspector Montalbano, a TV series set in four municipalities of Sicily, a region of Italy. We find that the series release led to a fourfold increase in the number of tourists and boosted tourist expenditure by a factor of 2.5. Furthermore, we provide evidence of positive spillovers in nearby municipalities. To estimate the tourism multiplier, we exploit the interaction between the filming locations and the time-varying share of countries in which the series was aired, to instrument total tourist expenditure at the municipality-time level. Our results show that a 10% increase in total tourist expenditure translates into an increase in municipal income of 4.7%. The paper suggests that both entertainment media and tourism can be powerful tools to boost economic development.

JEL-Codes: L820, L830, O120, Z320.

Keywords: media, tourism, economic development.

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1 Introduction

Tourism accounts for around 10% of global GDP and employment (World Travel Tourism Council, 2019). However, it is unclear whether and to what extent it can be an effective tool for boosting economic development. A thorough quantitative analysis on the economic impact of tourism is empirically difficult as tourist expenditure is potentially endogenous. Similarly, while there is considerable anecdotal and correlational evidence suggesting that entertainment media can be a powerful means of attracting tourism in filming locations (e.g., Riley *et al.* 1998; Hudson and Ritchie 2006b), drawing causal inferences on the link between entertainment media and tourism remains challenging.[1] An adequate counterfactual is typically lacking as media locations and the timing of releases are potentially endogenous.

This paper addresses these challenges by exploiting the staggered international release of *Inspector Montalbano*, an Italian TV series, whose main character is a police detective living in a fictional seaside town in Sicily. The municipalities in which the series was filmed (which we term "Montalbano municipalities"), were located in the province of Ragusa in an area historically unknown to tourists. This offers an ideal setting to assess the causal impact of entertainment media on tourism. Specifically, we use a triple-difference empirical strategy that exploits the differences in the average value of tourism outcomes (number of tourists or tourist expenditure): *i*) between countries exposed to the TV series (treated) and those not exposed (control); *ii*) between *Montalbano* municipalities and other municipalities in the same Italian region (Sicily); *iii*) before and after the release of the series. In turn, the exogenous shock created by the series on tourist expenditure provides us with a unique opportunity to estimate the causal effect of tourism on economic development. Specifically, we exploit the interaction between the time-varying share of countries exposed to *Inspector Montalbano* and a dummy for the *Montalbano* municipalities to instrument total tourist expenditure at the municipality-time level.

The analysis leverages a linked dataset, created by merging three data sources. The first is a rich survey dataset from the Bank of Italy on international tourist flows containing information

[1] A noteworthy–if anectodal–example may be found in the success of Petra, Jordan, as a tourism destination, which is usually attributed to the 1989 movie *Indiana Jones and the Last Crusade* (Business Insider, 2019). Other famous examples include the reputed links between *The Lord of the Rings* and tourism in New Zealand (Forbes, 2012) or *Braveheart* and tourism in Scotland (BBC News, 2015). Several contemporary TV series are believed to have had a similar impact, such as *Breaking Bad* in New Mexico (USA Today, 2013) and *Games of Thrones* in Ireland, Spain, Iceland and Croatia (Telegraph, 2019).

on the date of the visit, country of origin, municipalities visited, and money spent in each visited municipality for the period of 1997-2017 for tourists from all countries of the European Union.[2] The second source is comprised of administrative data from the Italian Ministry of Economy and Finance on personal income at the municipality-year level. Finally, we also collected data on the number of workers and firms in the tourism sector from the Italian National Statistical Institute, similarly available at the municipality-year level.

In terms of *media multiplier* (Besley *et al.*, 2020), our baseline estimates show that the number of tourists visiting *Montalbano* municipalities increased fourfold after the release of the TV series, whereas tourist expenditure increased by a factor of 2.5. Importantly, we document that the series release did not crowd out tourism from other municipalities in the same region. Indeed, it appears to have created positive spillovers, especially in nearby municipalities. Meanwhile, our estimates of the *tourism multiplier* indicate that a 10% increase in total tourist expenditure translates into a 4.7% increase in municipal income. We also show that the latter effect is driven by an increase in the extensive margin (more taxpayers overall) as well as the intensive margin (more income per taxpayer). Furthermore, the *tourism multiplier* effect is also associated with a shift of taxpayers from lower to higher income brackets. Finally, we provide evidence that total tourist expenditure does indeed create more jobs and firms in the tourist sector. Specifically, we find that a 10% increase in total tourist expenditure translates into an 11.5% increase in the number of firms and a 10.1% increase in the number of workers in the tourism sector.

We present several alternative specifications that demonstrate the robustness of our baseline results. When looking at the impact of media on tourism, our alternative specifications include the exclusion of larger municipalities, limiting our sample to the countries in the European Union at the time of the first international release of *Inspector Montalbano*, estimating a Poisson model for the number of tourists, and using an alternative dataset drawn from *Tripadvisor*.[3] For our analysis of the impact of tourism on economic outcomes, we provide robustness checks that focus on different sub-samples or exploit the use of alternative instruments (e.g., weighting the share of countries exposed to *Inspector Montalbano* by country population or GDP).

[2]Specifically, we consider all international tourists coming from any of the 27 countries belonging to the European Union in 2017, which is when our sample period ends. Around 1/3 of the countries in our sample had been exposed to the *Inspector Montalbano* TV series by 2017.

[3]We limit the use of the *Tripadvisor* data to a robustness check since it covers a more limited time period and does not contain information on tourist expenditure.

Most importantly, the paper presents an extensive set of tests to formally validate our empirical strategy. The identifying assumption behind our triple-difference empirical strategy is that relative differences in tourism outcomes between treated and control countries trend similarly in *Montalbano* and control municipalities prior to the series release (Olden and Møen, 2020). Accordingly, we provide evidence to support this assumption of parallel trends in tourist inflows and expenditure. While this would suffice to corroborate the validity of our empirical strategy, we present additional evidence that demonstrates that the study setting exhibits several other desirable features. In particular, balance tests show that the observable characteristics of *Montalbano* and control municipalities are comparable in pre-treatment years. We also show that these observable characteristics cannot predict which municipalities would go on to be treated (randomization test). Further, using data on Google searches (in tourists' countries of origin), we demonstrate that there are no pre-trends of interest in the filming locations or the TV series prior to its international release. Meanwhile, we complement our baseline specification with an event-study approach that documents the absence of pre-trends in tourist inflows and expenditure. In addition, we present random inference tests in the spirit of Young (2018) and Dell and Olken (2020) that provide counterfactual placebo estimates of our treatment by randomly assigning a treatment to each country-municipality-year-month combination and comparing them to our baseline estimates. Finally, to address possible concerns related to the staggered nature of our treatment (Goodman-Bacon, 2018; Callaway and Sant'Anna, 2020; De Chaisemartin and d'Haultfoeuille, 2020; Athey and Imbens, 2021), we present estimates that consider a single cohort of treated countries at a time, with never-treated countries as controls.

Our paper contributes to the literature on the economic impact of media (see DellaVigna and La Ferrara 2015 for a review) by quantifying the economic impact on tourism of a credibly exogenous variation, across countries and time, in the exposure to entertainment media showing attractive but otherwise unknown tourist locations. In this respect, the closest papers to ours are Hinnosaar *et al.* (forthcoming) and Besley *et al.* (2020) on the effects on tourist inflows of Wikipedia and news on violent events, respectively.[4] In this regard, our paper offers insights on the impact of

[4]Our findings are also related to the literature on marketing and tourism, which has focused on the role played by specific movies in influencing tourist flows (Busby and Klug, 2001; Hudson and Ritchie, 2006a), the characteristics of movies that are positively associated with tourist flows (Riley and Van Doren, 1992; Riley *et al.*, 1998; Hudson and Ritchie, 2006b; Beeton, 2016), or stated preferences for a tourist destination (Soliman, 2011). Our paper contributes to this literature by highlighting the importance of exploiting credibly exogenous variation in exposure to entertainment media to properly infer causal effects.

entertainment media rather than that of additional information (Hinnosaar *et al.*, forthcoming) or negative news content (Besley *et al.*, 2020). This allows us to consider different and more direct policy implications relating to media and tourism. Moreover, by exploiting within-region variation in the treatment, we can narrowly identify the causal effect with our triple-difference strategy as well as assess the presence of potential spillover effects across tourist locations.[5] Our findings on the impact of entertaiment media on tourist destinations also speak to the literature on advertising and consumer persuasion (see DellaVigna and Gentzkow 2010 for a review). Stephens-Davidowitz *et al.* (2017) show that a 100 percent increase in Super Bowl ad impressions (defined as an increase of 100 Nielsen rating points) increases the revenue of featured movies by 50-70%. Similar elasticities have been found by Hartmann and Klapper (2018) in a study of beer and soft drink advertisements. Exploiting a randomized mail field experiment in South Africa, Bertrand *et al.* (2010) demonstrate the importance of advertising content, noting that certain features may lead to large effects. Valletti and Veiga (2021) find that looking at an online ad for an extra second increases the probability of purchasing a product by 0.72%. Our setting differs from these studies in terms of the advertising object: travel destinations rather than traditional consumer goods or services. More importantly, our setting also differs in terms of the advertising message, which is implicit and embedded within a media entertainment product.

Our analysis complements studies of the impact of tourism on economic development such as Faber and Gaubert (2019), who test predictions from a general equilibrium model on the effect of tourism on development at the local and national level by exploiting pre-existing differences in attractiveness between Mexican municipalities (e.g., beaches and historical sites).[6] Our study differs both in terms of its economic context (an underdeveloped region of a developed country in our case, as opposed to a developing country in Faber and Gaubert 2019) and its identification strategy, as we use a partial equilibrium empirical model and exploit a time-varying instrument for tourist inflows based on the staggered international broadcast of a television series. We can therefore control for all time-invariant characteristics at the municipality level and are able to

[5] In contrast to Hinnosaar *et al.* (forthcoming), we document an impact of media on tourism inflows beyond the intensive margin. In their examination of the Wikipedia treatment, Hinnosaar *et al.* (forthcoming) do not see any significant impact on Google searches, implying that their effect works through the intensive margin (e.g., among people already interested in a given locality, looking at Wikipedia to decide whether it is worth visiting or not). Meanwhile, we observe a positive and significant impact of the exposure to entertainment media on Google searches, suggesting that media exposure also affects the extensive margin.

[6] For cross-country evidence on the determinants and effects of tourism see Eilat and Einav (2004); Sequeira and Maçãs Nunes (2008); Arezki *et al.* (2009); McGregor and Wills (2017).

provide evidence on the absence of pre-trends.

Finally, this paper also relates to studies on within-country regional development (e.g., Tsui 2007 on China, Lintz and Schmude 2005; Heise and Porzio 2019 on Germany, Martin 1988; Gardiner *et al.* 2013 on Great Britain and Ballarino *et al.* 2013; Federico *et al.* 2019 on Italy). These studies suggest that the determinants of regional divides range from historical or institutional differences to resilience to a number of region-specific shocks.[7] Our paper contributes to the regional development literature by looking at Sicily, an underdeveloped region of a developed country (Italy) in which industrial policies and public subsidies have not been particularly successful (Accetturo and De Blasio, 2019; Albanese *et al.*, 2020). Our findings suggest that entertainment media and, in turn, tourism might be powerful engines of development that have been overlooked in the literature.

The remainder of the paper is structured as follows. Section 2 describes the characteristics of Sicily and of the TV series that are relevant for our empirical analysis. Section 3 presents the data and Section 4 outlines the empirical strategy. Section 5 discusses the main results on the effect of entertainment media on tourism, along with robustness specifications and validity tests. Section 6 introduces evidence on spatial spillovers, while Section 7 provides the results on the effect of tourism on economic development. Finally, Section 8 concludes.

2 Background: Sicily and *Inspector Montalbano*

In this section we describe the main characteristics of Sicily and the *Inspector Montalbano* TV series that are relevant to understanding our empirical strategy and interpreting the results.

2.1 Sicily

Sicily is an island region in the far south of Italy. It is home to around 5 million inhabitants, more than Ireland or Croatia and similar to US states such as South Carolina or Colorado. Measuring around 26,000 square kilometers in size, Sicily is larger than Slovenia or US states such as Vermont or New Jersey, and accounts for 5.2% of Italy's GDP. In PPP terms (2016, US$), GDP per capita

[7] Becker *et al.* (2013, 2018) analyze the impact of regional funds allocated by the European Union to mitigate economic disparities and show that while this funding has fostered convergence, the speed at which the latter takes place seems to depend on predetermined economic conditions in a given region. See also Albanese *et al.* (2020) for the case of southern Italy.

in Sicily is around $24,300, the second-lowest in the country and slightly above that of Cyprus. For comparison, average Italian GDP per capita is 1.6 times higher, while Mexico's is around 1.3 times lower (World Bank, 2020).

The persistence of the Italian north-south divide in economic development has attracted considerable attention from both academics and policymakers. This issue is not, however, specific to Italy but also applies to other developed countries, to varying degrees. One such example is Germany (Heise and Porzio, 2019), which is characterized by regions that lie far behind the national average, such as the Ruhr. Different solutions have been offered to solve this issue. A first one is a massive relocation of workers to more prosperous regions: indeed, Italy experienced extensive internal migration from the south to the north after WWII (Bartolucci *et al.*, 2018). Nevertheless, as recently shown by Heise and Porzio (2019), there are large costs associated with the relocating of people across space. A clear alternative is to foster the economic development of disadvantaged regions. In Italy, these efforts have taken the form of subsidizing firms willing to open factories in the south and by injecting vast amounts of public funds, though with little success (Accetturo and De Blasio, 2019; Albanese *et al.*, 2020).

Others, meanwhile, have noted the South's considerable tourism potential and attractiveness, advocating for these regions to foster tourism as a way to boost economic development. However, despite its mild climate, long coastline, and very rich cultural and archaeological heritage, tourism accounts for only 5.3% of Sicilian GDP in terms of direct contributions and 11.4% in terms of total contributions (Caselli, 2017).[8] This is similar to the national average, but below several other Italian regions in terms of tourism's share of total GDP (which is higher in Calabria, Sardinia, Puglia, Abruzzo, Emilia-Romagna, Veneto) as well as total GDP from tourism (higher in Campania, Emilia-Romagna, Lombardy). In Italy, average per capita added value generated by tourism is 3,000 euros–a figure that is only 1,800 euros in Sicily, one of the lowest in the country.

2.2 *Inspector Montalbano*

Inspector Montalbano is a TV series featuring a police detective (Montalbano), who lives in a fictional seaside town in Sicily. The series is set in various locations in four municipalities of

[8] It is worth adding that, despite having historically been the cradle of the Mafia (Buonanno *et al.*, 2015), Sicily has a relatively low crime rate compared to many other Italian or EU regions (Eurostat, 2021).

the province of Ragusa (see Figure 1).[9] Figure 2 provides a map of European Union countries (excluding Italy) at the end of our sample period (2017), showing whether the country was exposed to *Inspector Montalbano* or not, as well as the year in which the series was released in each treated country.[10] The release year refers to the first broadcast of *Inspector Montalbano* on free-to-air TV channels. Such free-to-air broadcasts of *Inspector Montalbano* are likely to represent a supply-side shock in the broadcasting country. Specifically, the broadcasting of the TV series increases the supply of images of historical and natural landscapes and other amenities (e.g., food), among other characteristics, connected to the *Inspector Montalbano* locations.

In principle, one might be concerned by the potential endogeneity of such a supply shock. That is, treated countries and municipalities might be endogenous as the release of the series in a given country might be driven by pre-existing interest in visiting the destinations. While Section 4 formally presents our empirical strategy and provides evidence to support our identifying assumption, there are some reasons why such concerns are unlikely to be valid in this context.

First, *Inspector Montalbano* was not a typical "blockbuster" production. The per-minute production cost of each episode was around $15,000 (which is around 1/8 of the cost of series such as *Game of Thrones*).[11] Importantly, the key feature of the series is the crime-solving plot of each episode. As such, it is likely that international broadcasters chose to buy the broadcasting rights due to their assessment of possible demand for an Italian (or even Sicilian) crime drama rather than due to viewers' potential interest in a very specific area of Sicily.

Second, the municipalities where the series was staged were "off the beaten path". Thus, international viewers were unlikely to know them before they watched the series. To this point, Table 1 provides evidence showing that various demographic, geographic, economic and tourism characteristics assessed in census year 2001 (i.e., at the time of the series' first international release) are balanced between *Montalbano* municipalities and control ones. Moreover, in order to test whether *Montalbano* municipalities were chosen for a particular characteristic, we also perform a randomization test showing that none of the observable characteristics can predict which municipalities

[9] The series is mainly set in five locations: Donnafugata, Modica, Puntasecca, Ragusa and Scicli, which are located in the Sicilian municipalities of Modica, Ragusa, Santa Croce Camerina and Scicli.

[10] The specific year-months of the official release of *Inspector Montalbano* across countries are as follows: France: 09/2000; Sweden: 06/2001; Germany: 09/2001; Finland: 11/2001; United Kingdom: 12/2008; Hungary: 01/2009; Spain: 01/2012; Greece: 09/2012. These release dates were kindly provided to us by *Palomar S.P.A.*, the production company for *Inspector Montalbano*, which holds the copyright to the TV series.

[11] "Quanto Costano e come rendono le grandi fiction Rai e Sky", June 28, 2019; "How much money 'Game of Thrones' episodes cost to make in the final season, and throughout the series", *Business Insider*, April 19, 2019.

are treated. Both tests show that the *Montalbano* municipalities were rather similar to an average Sicilian municipality, and thus implicitly suggest that such municipalities were instead different with respect to the island's traditional tourist locations (e.g., Palermo, Taormina).

Google Trends data provide additional evidence on the orthogonality of the *Inspector Montalbano* release dates with respect to demand-side factors. Specifically, we gathered data from Google Trends on the volume of searches related to *Inspector Montalbano*, i.e., "Montalbano", or its location, i.e.,"Ragusa", the main setting and the capital of the province where the series is filmed. The left panels of Figure 3 plot the average monthly index of Google Trends search volumes related to both of the above terms after regressing the volumes with respect to country and year-month fixed effects.[12] The right panels of Figure 3 present the results of an event-study estimation with respect to the timing of the series release.[13] This evidence suggests the absence of pre-trends in terms of interest in *Inspector Montalbano* or in the main municipality where the series was set. Conversely, Figure 3 also shows that people actively searched for keywords related to the series and its location after its release.

Finally, Section 5.2.1 provides additional evidence on the exogeneity of the timing of international broadcasts of *Inspector Montalbano* by presenting event studies on tourism inflows and expenditure, which show the absence of pre-trends.

3 Data

We leverage rich survey data on international tourism in Italy spanning the period from 1997 to 2017. The survey—conducted by the Bank of Italy—is based on interviews of non-resident travelers at the Italian borders (i.e., road and rail crossings, international ports and airports).[14] The survey

[12]Residualizing with respect to country fixed effects is necessary to normalize the series, as each Google Trend volume shows changes in Google searches over time within a given country. Since each series does not provide an absolute value for the number of Google searches in a given country-month, it is not possible to compare raw series interest across countries. By taking the residual with respect to country fixed effects, we obtain an index that is more comparable across countries. Year-month fixed effects are also included to control for seasonality.

[13]Countries where *Inspector Montalbano* was released before the start of the Google Trends data (i.e., Finland, Greece, France, Sweden and Germany) are excluded from the analysis, since we cannot assess the existence of potential pre-trends for these countries (Miller, 2017). Instead, never-treated countries are included in the analysis, though the pattern does not change when the latter countries are excluded. Results are available upon request.

[14]"The survey is conducted with the primary objective of compiling the "Travel" item (which includes goods and services purchased by individuals in countries where they are not residents, in relation to travels in those countries) and the "International passenger transport" item of the Italian Balance of payments, in line with the methodological conventions established by the sixth Manual of the IMF." (Bank of Italy, 2019). Bank of Italy adopts a systemic sampling method with fixed n for surveying tourists, and it provides estimated expanded variables on the total

contains information on the country of origin of each tourist, the municipality visited, the date of each visit and the money spent in each location. In order to have a more homogeneous dataset in terms of tourist inflows, we focus on international tourists coming only from countries belonging to the European Union in 2017 (i.e., at the end of the sample period). Accordingly, we have a sample covering 27 countries of whom around 1/3 is exposed to *Montalbano* by 2017. We end up with a balanced sample of 2,653,560 observations on the number of tourists and on tourist expenditure at the country-municipality-year-month level over the period 1997-2017. As a robustness exercise, we complement this baseline dataset with information on tourism flows coming from the universe of reviews posted on a travel-review website over the period 2002-2017. Specifically, we collected tourist data (i.e., country of origin, date of stay, place visited, etc.) from reviews of 4,670 Sicilian accommodations registered on *Tripadvisor*, the world-leading website of travel-related reviews. We simply count the number of reviews per country of origin posted on the accommodations located in each Sicilian municipality, in each available year-month. As *Tripadvisor* reviews in Italy start in 2002, we build a balanced sample of 2,021,760 observations at the country-municipality-year-month level over the period 2002-2017.[15]

Finally, in order to implement the analysis on economic development, we merge tourism data from Bank of Italy with data on total personal income and number of taxpayers at the municipality-year level. These data are provided by the Italian Ministry of Economy and Finance and span the period 2000-2017. Additionally we gather data on the number of firms and workers in the tourism sectors at the municipality-year level from the register of active firms provided by the Italian National Statistical Institute (ASIA-ISTAT) which are available for the years 2004-2017. We then complement this firm/workers data with analogous data from the 2001 census. Data on economic outcomes at municipal level are available on a yearly base. For this reason, using data from the Bank of Italy, we sum tourist expenditure of all countries in our sample at the municipality-year level in order to have a yearly measure of total tourist expenditure for each Sicilian municipality.

number of tourists and on tourist expenditure by country of origin, municipality visited and time of the visit. Additional details are provided in the methodological notes by the Bank of Italy (Bank of Italy, 2017).

[15]Beside the limited time period and the absence of information on tourist expenditure, one additional concern regarding *Tripadvisor* data is that they potentially underestimate the tourist inflow for two main reasons: a) they rely exclusively on individuals using the *Tripadvisor*'s services, both tourists and accommodations; b) people who write reviews may travel with other tourists, and we are not able to identify the exact number of people traveling and all their nationalities. For these reasons and given the more limited time span covered by these data, and the absence of information on tourist expenditure, we limit the use of *Tripadvisor* data as a robustness test on our baseline results using the Bank of Italy survey data.

Accordingly, we merge data on total tourist expenditure at the municipal level with municipal income to obtain a balanced panel of 390 municipalities over 18 years (2000-2017), ending-up with 7,020 municipality-year observations.[16]

4 Empirical strategy

As explained in Section 3, our proxies for tourism—number of tourists and tourist expenditure—vary along three dimensions: municipalities, countries, and time. Accordingly, we can estimate a so called triple difference (TD) exploiting the difference between treated and control municipalities and the difference between treated and control countries before and after the series release (Gruber, 1994).[17]

In particular, we construct a variable measuring the intention to treat with respect to the *Montalbano* series release as the interaction of two indicator variables. Specifically:

$$Montalbano_{c,m,t} = MontalbanoCT_{c,t} \cdot MontalbanoM_m \tag{1}$$

where subscripts c, m, and t stand for country, municipality, and time (year-month), respectively. $MontalbanoCT_{c,t}$ is a dummy that varies at the country-time level and identifies a treated country: it takes a value of one for countries exposed to *Montalbano* after the time of release onward. Formally,

$$MontalbanoCT_{c,t} = MontalbanoC_c \cdot \mathbb{1}_{t>r_c}$$

where $MontalbanoC_c$ is a dummy variable that varies at the country level, it takes a value of one if a country is ever treated (i.e., if it is ever exposed to the series over our sample period 1997-2017). r_c represents the start of the treatment period in country c, that is the year-month of the *Montalbano* release in country c (normalized to ∞ for countries never treated, i.e., for $MontalbanoC_c$ =0).[18] $MontalbanoM_m$ is a dummy variable that varies at the municipality level,

[16]Similarly, when we merge total tourist expenditure with data on firms and workers in the tourism sector we end-up with a balanced sample of 390 municipalitie over 15 years (census year 2001 and 2004-2017), hence obtaining 5,850 municipality-year observations.

[17]Frequently, this strategy is also referenced as *difference-in-difference-in-differences* (DDD or DDDs). For simplicity, we adopt the triple difference (TD) terminology as also suggested by Olden and Møen (2020).

[18]We define a corresponding starting-treatment year when considering yearly outcomes (e.g., when looking at the impact of yearly total tourist expenditure on municipal income). The starting-treatment year is defined as the year of the first summer holiday season after the release of the series in country c, to account for the heterogeneity of the release-month with respect to such tourism season. That is, it is equal to the release year if the month of release in country c is before September. Instead, it is equal to the year after the release if the month of release in country c is

it simply identifies treated municipalities (i.e., those where the series was staged). That is,

$$MontalbanoM_m = \mathbb{1}\{MontalbanoLocation \subset Municipality_m\}$$

Accordingly, we estimate the following equation:

$$Y_{c,m,t} = \alpha_{cm} + \alpha_{ct} + \alpha_{mt} + \beta^{TD} Montalbano_{c,m,t} + \varepsilon_{c,m,t} \tag{2}$$

where $Y_{c,m,t}$ represents the total number of tourists (or tourist expenditure) from country c, in a Sicilian municipality m, and in the year-month t. α-terms capture country-municipality, country-by-time, and municipality-by-time fixed effects, respectively. In particular, the inclusion of α_{cm} allows us to control for any idiosyncratic component at the country-municipality level (e.g., historical tourism or migration links between a municipality and a country). α_{ct} and α_{mt} control non-parametrically for heterogeneous trends in tourism flow dynamics across countries and municipalities, respectively. We adopt a two-way clustering of standard errors at the country and local area (LA) levels (Cameron *et al.*, 2011; Cameron and Miller, 2015).[19] Specifically, LAs are clusters of neighbor municipalities officially determined by the Italian National Statistical Institute (ISTAT) and represent a conservative choice under the assumption that—considering the small size of municipalities in our sample—unobserved components of the outcomes are correlated across units within clusters (Abadie *et al.*, 2017).[20]

The TD coefficient of interest, β^{TD}, captures the time change in the average value of the dependent variable for treated countries in *Montalbano* municipalities and then nets out the change in means for control countries in *Montalbano* municipalities, the change in means for treated countries in control municipalities, and the change in means for control countries in control municipalities.[21] This specification controls for two kinds of potentially confounding trends: changes in tourist

after August. Results are robust to alternative specifications of the treatment year and are available upon request.

[19] As a robustness check, we also present estimates for our baseline results adopting the clustering method proposed by Conley (1999), with standard errors corrected for spatial correlation among municipalities that fall within 50 kilometers from each other, and for serial correlation up to 6 months. Additionally, in the spirit of Cameron *et al.* (2011), we have considered also a three-way clustering including time (year-month) as a third dimension. Results are also robust under this alternative specification and they are available upon request.

[20] There are 73 LAs in Sicily that group 390 municipalities. The mean number of municipalities per LA is 8.6 with a median equal to 7. As a robustness, we also present baseline estimates when clustering standard errors as suggested by Conley (1999), that is correcting for spatial correlation among municipalities that fall within 50 kilometers from each other, and for serial correlation up to 6 months (Table 2).

[21] Formally, $\beta^{TD} = \left[(\bar{Y}_{C,M,2} - \bar{Y}_{C,M,1}) - (\bar{Y}_{c,M,2} - \bar{Y}_{c,M,1})\right] - \left[(\bar{Y}_{C,m,2} - \bar{Y}_{C,m,1}) - (\bar{Y}_{c,m,2} - \bar{Y}_{c,m,1})\right]$ where the subscripts C and M identify treated countries and municipalities, respectively. c and m stand for control countries and municipalities, and subscripts 1 and 2 simply refer to pre- and post-series release periods.

flows—unrelated to the *Montalbano* release—from treated countries across municipalities, and changes in tourist flows in *Montalbano* municipalities possibly due to other municipalities-specific changes that affect the overall tourist flows. Even though the TD estimator can be interpreted as the difference between two difference-in-differences, it does not need two parallel trend assumptions. Rather, the only identifying assumption it requires is that the relative outcome of treated and control countries in Montalbano municipalities trends similarly to the relative outcome of treated and control countries in the control municipalities, in the absence of treatment (Olden and Møen, 2020). Figure 4 provides direct evidence in support of this parallel trend assumption. The graph shows leads and lags of the difference in the mean number of tourists (left panel) and in the mean tourist expenditure (right panel) in *Montalbano* municipalities (solid line) and in control municipalities (dashed line) with respect to the timing of the *Montalbano* release. Put it differently, the curves compare pre-treatment trends of the two difference-in-differences that enter in the TD estimator. The Figure shows that in the pre-treatment period relative outcomes of treated and control countries have the same trend in both *Montalbano* and control municipalities.

For what concerns the impact of tourism on economic development, we build a panel dataset at the municipality-year level and we estimate the following model equation:

$$Y_{m,t} = \alpha_m + \alpha_t + \theta_1 TE_{m,t} + \varepsilon_{m,t} \tag{3}$$

where $Y_{m,t}$ measures our outcomes of interest: namely, total personal income, number of taxpayers, and the number of firms and workers in the tourism sector. α_m and α_t represent municipality and year fixed effects, respectively. The variable $TE_{m,t}$ measures the total tourist expenditure of all the countries in our sample, in municipality m, and in year t. It is simply the country-sum of the tourist expenditure at the municipality-year level as described in section 3.[22] Yet, total tourist expenditure at the municipality-year level might potentially suffer from endogeneity, for example in terms of reverse causality (e.g., richer municipalities may attract more tourists or invest more in tourism advertisements/services). This would lead to a biased OLS estimation of the equation (3). For this reason, in order to infer the casual relation of interest, we instrument the total tourist expenditure in a municipality-year by exploiting the interaction between a dummy identifying

[22]For what concerns the analysis on the impact of total tourist expenditure on municipal outcomes, since we lose the country dimension we simply cluster standard errors at the local area level. Also in this case, we estimate our model by using a two-way clustering including time (year) as a second dimension (Cameron *et al.*, 2011), results are robust to this alternative specification and they are available upon request.

Montalbano municipalities and the time-varying share of countries exposed to *Montalbano*. That is, we construct our instrument as follows:

$$ShareExposed_{m,t} = MontalbanoM_m \cdot \left[\frac{\sum_c MontalbanoCT_{c,t}}{\sum_c \mathbb{1}_c} \right]_t \tag{4}$$

where $\sum_c MontalbanoCT_{c,t}$ is the number of countries exposed to the release of *Montalbano* in year t.[23] $\sum_c \mathbb{1}_c$ is simply equal to the total number of countries in our sample (27). The exclusion restriction is that changes in the share of countries exposed to *Montalbano* differentially affect *Montalbano* municipalities vs. other Sicilian municipalities only through its effect on total tourist expenditure.

5 The Effect of Media on Tourism

Table 2 shows our baseline results on the effect of being exposed to the *Montalbano* TV series on our two key outcome variables: number of tourists (Columns 1-2) and tourist expenditure (Columns 3-4). Columns 1 and 3 provide estimates with two-way clustering of standard errors at the country and local area (LA) level. Columns 2 and 4 provide estimates when clustering standard errors as suggested by Conley (1999), that is correcting for spatial correlation among municipalities that fall within 50 kilometers from each other, and for serial correlation up to 6 months. Results show a positive and significant impact of the *Montalbano* series on both tourism inflows and tourist expenditure. In terms of magnitudes, we compare our baseline coefficients with the average outcome of tourists from treated countries in control municipalities (i.e., tourists from countries exposed to the series release not visiting *Montalbano* municipalities, see Table A.1). Accordingly, the implied *media multiplier* (Besley *et al.*, 2020) is such that the series release led to a fourfold increase in the number of tourists and boosted tourist expenditure by a factor of 2.5.[24] In the following subsections, we discuss the results of a battery of robustness checks and validity tests.

[23] Table 6 provides robustness results when considering alternative instrumental variables that differently weight the share of treated countries (e.g., weighting the share of treated countries by the distance from Ragusa, by country population, by country GDP).

[24] Our *media multiplier* effect is almost three times larger than the one found in Besley *et al.* (2020). Such different magnitudes might be potentially driven by several differences of the two contexts under analysis, e.g., direction of the media shock, tourists' prior beliefs on the destination locations and persistence of the shocks.

5.1 Robustness

Table 3 provides several robustness checks. Panel A reports the estimated effect considering the number of tourists as a dependent variable. Panel B presents the corresponding estimates when considering tourist expenditure as a dependent variable. Column 1 shows that our results are robust to considering an alternative treatment variable defined as the interaction between the *Montalbano* municipality dummy and a continuous variable keeping track of the number of years between the series release and year of the travel. This specification accounts for the fact that some countries are treated for a longer period than others and, therefore, it aims to capture the "intensive margin" of exposure to entertainment media. Moreover, we provide evidence that our results are robust to focusing on alternative data samples at the country or municipality level. In Column 2, we only consider countries that were already belonging to the European Union at the time of the first international release of *Montalbano*. In Column 3, we exclude provincial capitals and, as expected, the coefficients are lower with respect to our baseline specification, as provincial capitals tend to attract the bulk of tourists. In Column 4, we focus on the subperiod 1997-2012. This is relevant as in 2013 a new airport (Comiso) opened in the South-East of Sicily.[25] The estimates remain rather similar to our baseline effects both in terms of magnitudes and significance and both with respect to the number of tourists and tourist expenditure. As the number of tourists is a count variable, in Column 5 of Panel A we estimate a fixed effect Poisson model (Correia *et al.*, 2019) as a robustness check of our baseline results.[26] Results remain highly statistically significant coefficient. The coefficient of the Poisson specification must be interpreted as a log variable. Hence, it indicates that the release of *Montalbano* in a country leads to an increase by around 65% in tourism inflows from that country in the *Montalbano* municipalities. Column 6 of Panel A presents the results of our baseline specification on the total number of tourists when using observational data from *Tripadvisor* (rather than survey data from Bank of Italy). Notice that in this case the time span is 2002-2017. Results from *Tripadvisor* data are also highly significant with greater implied magnitudes relative to the baseline specification. Specifically, looking at the

[25] While the opening of this airport is likely to have impacted tourism (David and Saporito, 2018), it is worth remarking that all our countries are treated before the opening of the airport. Accordingly, the presence of a new flight connection from treated countries might be by itself seen a possible endogenous effect induced by the release of the TV series. On the other hand, the opening of a flight connection from control countries works against our baseline effect and would lead to a downward bias in our estimates.

[26] The number of observations is net of those separated by fixed effects (Correia *et al.*, 2019).

average outcome of tourists from treated countries in control municipalities in the *Tripadvisor* dataset (see Table A.1), the total number of tourists increases by almost 6 times for the effect of the TV series release. This provides both mutual cross-validation for our two independent sources of data (Bank of Italy and *Tripadvisor*) and it offers a robustness check of our baseline results. Finally, Column 7 of Panel A shows that results are robust when considering the number of nights (rather than the number of tourists) as an alternative tourism outcome.

5.2 Validity Tests

As explained in Section 4, our triple difference empirical strategy only requires the relative difference in tourism outcomes between treated and control countries to exhibit parallel trends in *Montalbano* and control municipalities in the pre-treatment period (Olden and Møen, 2020). Nevertheless, this section presents the results of an event study design showing the absence of pre-trends in our main outcomes of interest. Furthermore, we present random inference tests in the spirit of Young (2018) and Dell and Olken (2020). Finally, to address possible concerns related to the staggered nature of our treatment (Goodman-Bacon, 2018; Callaway and Sant'Anna, 2020; De Chaisemartin and d'Haultfoeuille, 2020; Athey and Imbens, 2021) we present estimates when considering one-cohort of treated countries at the time using only never-treated units as controls.

5.2.1 Event-study

Figure 6 plots the coefficients from the following event-study specification:

$$Y_{c,m,t} = \alpha_{cm} + \alpha_{ct} + \alpha_{mt} + \sum_{j=-\tau}^{\tau} \beta_j Montalbano^j_{c,m,t} + \varepsilon_{c,m,t} \tag{5}$$

where Y represents our outcome of interest: namely, the number of tourists or tourist expenditure. The α-terms stand for country-municipality, country-by-time, and municipality-by-time fixed effects, respectively. $Montalbano^j_{c,m,t}$ are leads and lags of the variable $Montalbano_{c,m,t}$ defined in Equation (4), i.e., with respect to the release year in country c. Specifically,

$$Montalbano^j_{c,m,t} = \cdot MontalbanoM_m \cdot MontalbanoC_c \cdot \mathbb{1}_{\{t=r_c+j\}}$$

where r_c, in this case, represents the year in which country c experienced the *Montalbano* release.[27] According to the time-span of our sample, we fix $\tau = 4$, we normalize $\beta_{-1} = 0$, and we use a two-way clustering of standard errors as described in Section 4.[28]

Each point in the graph therefore represents the average difference in the dependent variable relative to the treated country-municipality tuple one year before the series release, after controlling for all fixed effects. Overall, Figure 6 highlights the absence of pre-trends in the number of tourists or tourist expenditure and provides evidence of significantly positive effects in the years following the series release. This evidence also complements the analysis, presented in Section 2.2, on the event-study exploiting Google Trends data on searches on words related to the TV series itself ("Montalbano") or location ("Ragusa").

All in all, the evidence from these event studies suggests the absence of pre-trends in terms of interest in the "Inspector Montalbano" series or in the main municipality where the series was staged and, correspondingly, in tourism outcomes toward such locations. At the same time, after the release of the TV series, people actively searched for keywords related to the series and linked locations and, then, visited such locations.

5.2.2 Random Inference Tests

We construct 1,000 counterfactual distributions of our treatment by randomly assigning a treatment to each country-municipality-year-month combination. In particular, we construct counterfactual distributions of the treatment by: a) randomizing the timing of the treatment (i.e., keeping the actual treated country-municipality pairs and randomizing the time of the release of the TV-series); b) randomizing the treated municipalities (i.e., keeping the actual treated country at time t and randomizing the treated municipalities);[29] c) Randomizing both over time and over municipalities (i.e., combining a) and b)). Figures 7 and 8 show—for the number of tourists and tourist expenditure, respectively—the distribution of counterfactual estimates over these three dimensions, and compares it to the coefficient from the actual treatment (red vertical line). The distribution of estimated placebo counterfactual effects implies a p-value of 0.000, where the p-value measures the fraction of the absolute value counterfactual placebo coefficients to the right

[27] We look at yearly aggregates (rather than year-month outcomes) to provide a clearer picture of the leads and lags effects. Event-study estimates at the monthly level provide similar insights and they are available upon request.

[28] We follow McCrary (2008) and bind up end-points. Results are similar for alternative windows.

[29] In particular, the randomization process randomly picks four municipalities at a time to be selected as the treated ones, in line with the number of the actual *Montalbano* municipalities.

of the value of the actual coefficient.

5.2.3 Staggered Treatment

To address possible concerns related to the staggered nature of our treatment (Goodman-Bacon, 2018; Callaway and Sant'Anna, 2020; De Chaisemartin and d'Haultfoeuille, 2020; Athey and Imbens, 2021) we present estimates when considering one-cohort of treated countries and at a time, using only never-treated units as controls. In particular, each cohort of estimation includes all control countries (i.e., those never exposed to the series) and treated countries in which the series has been released in the same year. Using information on the TV series release year across countries, we define five cohorts of treated according to whether the *Montalbano* release is in the same year. Given the aggregation by cohorts, as different countries within the same cohort are exposed to the *Montalbano* series in different months, we also aggregate data at the yearly level. Table A.3 in the Appendix shows that even in the absence of staggered treatment effects our TD coefficient is positive and statistically significant.

6 Spillover Effects

In this section, we analyze whether the exposure to the TV series created positive spillovers in other Sicilian municipalities. Or, rather, the positive effect on tourism flows to the *Montalbano* municipalities came at the expense of other municipalities (i.e., crowding-out tourists from non-treated municipalities). To answer this question, we focus on a control group constituted by all municipalities in Southern Italy with the exclusion of Sicily. That is, we compare the effect of the exposure to *Montalbano* on tourist flows from country c on all Sicilian municipalities (or subsets of them) versus municipalities in other southern regions. More explicitly, we use the same empirical specification of our baseline regression. Yet, we consider as treated different subsets of municipalities in Sicily (Figure 5) and look at the impact of the TV series on those municipalities compared with other municipalities in the Southern Italy.

Table 4 reports the results. Panel A reports the estimated effect considering the number of tourists as a dependent variable. Panel B presents the corresponding estimates when considering tourist expenditure as a dependent variable. Column 1 reports positive estimates for all municipalities in Sicily (excluding the actual *Montalbano* municipalities from the sample), which

are marginally significant for tourist expenditure while imprecisely estimated for the number of tourists. All in all, Column 1 suggests that the gain in tourist inflows experienced by the *Montalbano* municipalities did not come at the expense of other municipalities. Rather, on average, other areas of Sicily benefited from positive spillovers. Consistent with the mechanism, the larger and/or more significant effects are present for municipalities close to the *Montalbano* ones: municipalities in the province of Catania (Column 9) or Siracusa (Column 10). At the same time, Table 4 confirms that the larger coefficients are indeed the ones obtained considering in the treated group only the municipalities where the series was actually staged (Column 10).

7 The Effect of Tourism on Economic Development

In order to estimate the effect of tourism on economic development by adopting the instrumental variable approach described in section 4, we build a balanced sample at the municipality-year level. In particular, as already mentioned in section 3, we sum total tourist expenditure of all country-month pairs in each municipality for each year in the period 2000-2017. In this way, we build a yearly measure of tourist expenditure (from all countries of our sample) at the municipality-year level. We end up with a balanced sample of 7,020 observations. We use this sample to estimate the effect of total tourism expenditure (instrumented by Equation (4)) on total municipal income. The estimates are reported in Table 5 and show that an increase of one thousand euros in total tourist expenditure result in an increase of municipal income by 0.02%. Put differently, by relating these quantities with the sample averages on tourist expenditure and total income, we can derive an implied *tourism multiplier* effect such that a 10% increase in total tourist expenditure leads to an increase in total municipal income by 4.7%. Notably, such multiplier is in line with the estimates by Faber and Gaubert (2019) who find that a 10% increase in local hotel revenues leads to a 4% percent increase in nominal municipality GDP in Mexican municipalities. Columns 2-6 shows the total effect decomposed by income brackets. The estimates show a positive and significant effect for all income groups above 16 thousands euros and a negative one below. This suggests that the increase in total tourist expenditure created a shift upward of the income distribution.[30]

Table 6 provides evidence of the robustness of the impact of tourism on municipal income.

[30]Table A.4 in the appendix provides the OLS estimates. The OLS downward bias suggests that municipalities with a higher income tend to experience a lower impact of total tourist expenditure on overall income. This might be due to the fact that, on average, in richer municipalities a lower share of municipal income relates to tourism.

In particular, it shows that results are consistent when focusing only on the subset of countries that were already in the EU in 2000, i.e., before the first international release of the Montalbano series. Similarly, results are robust when excluding provincial capital or considering only the period before the opening of the Comiso airport in the South-East of Sicily, i.e., before 2013. Finally, considering alternative instrumental variables that differently weight the share of treated countries (e.g., weighting the share of treated countries by the distance from Ragusa, by country population, by country GDP) leads to very similar estimates both in terms of significance and magnitudes.

In order to better understand the mechanism and the drivers, Table 7 provides estimates by decomposing the overall effect of total tourist expenditure on municipal income in the extensive and intensive margin. Specifically, Panel A (Columns 1-6) looks at the impact of total TE on the number of taxpayers. The estimates in Column 1 suggest that a 10% increase in total TE leads to an increase in municipal taxpayers by 0.64%. Columns 2-6 present the effects by income brackets, showing that—consistent with the results of Table 5—the positive effect on the extensive margin is driven by an increase in the number of taxpayers with an income above 16,000 euros while, if anything, it leads to a drop in the number of taxpayers in the lowest income group (below 16,000 euros). Panel B shows that total tourist expenditure also have a positive effect on the municipal income per-taxpayer. The estimates in Column 7 suggest that a 10% increase in total TE leads to a 0.05% increase in municipal income per-taxpayer. Columns 8-12 show the presence of some negative effects on the upper-brackets due to a larger increase in the denominator (i.e., in the overall number of taxpayers in those income classes). All in all, the results provide evidence that tourist expenditure might be a significant driver of economic development.[31] Finally, Table 8 provides further evidence in this regard by showing that total tourist expenditure has a positive and significant impact both on the number of firms and number of workers in the tourism sector. Specifically, we find that a 10% increase in total tourist's expenditure translates into a 11.5% increase in the number of firms and a 10.1% increase in the number of workers in the tourism sector.

[31] As our main dependent variable is given by the total declared personal income aggregated at the municipality-year level, our effects might be biased upward or downward if tourism affects the propensity of declaring income to the tax authorities, in a direction or another. The estimated effects might be an upper bound of the true effect of tourism on municipal income if international tourism increases such propensity. Instead, it might represent a lower bound, if part of the tourist expenditure goes into the informal economy.

8 Concluding Remarks

We provide evidence of the impact of entertainment media on tourism and, in turn, the overall impact of tourism on municipal income. This is done by leveraging rich data on international tourism and exploiting the staggered international release of *Inspector Montalbano*, an Italian TV series set in southeastern Sicily. We document that the exposure to the series drew tourists toward the filming locations, with positive spillovers also observed in nearby areas. Furthermore, we provide evidence of a positive and significant impact of tourism on economic development using the interaction between a dummy variable identifying *Montalbano* municipalities and the time-varying share of countries in which the series had been released, as an instrument for total tourist expenditure in a municipality.

In terms of the *media multiplier* (Besley *et al.*, 2020), exposure to *Inspector Montalbano* translates into an increase in tourist expediture of a factor of about 2.5. Our implied *media multiplier* is thus almost three times larger than that found in Besley *et al.* (2020). We speculate that such differences in magnitude might be driven by several factors. First, it could be due to the different direction of the media effect with respect to viewers' beliefs on the desirability of a given destination (positive in our case and negative in Besley *et al.* 2020). Second, in our context, destinations were likely to be completely unknown to viewers prior to the series release, which may have amplified the media effect. Finally, as noted by Besley *et al.* (2020), the persistence of a media shock (e.g., the broadcasting or re-broadcasting of episodes over time) might also result in a larger *media multiplier*. Future research on the impact of different types of media shocks in different contexts may prove helpful in assessing the range and drivers of such a *media multiplier*.

It is also possible to relate the media effects we identify with similar effects reported in the literature on advertising and consumer persuasion (Bertrand *et al.*, 2010; DellaVigna and Gentzkow, 2010; Stephens-Davidowitz *et al.*, 2017; Hartmann and Klapper, 2018; Valletti and Veiga, 2021). In this respect, our estimates suggest that exposure to *Inspector Montalbano* may generate an effect akin to the exposure to three Super Bowl ads (Stephens-Davidowitz *et al.*, 2017).[32] Or, stated in terms of the elasticity of consumers' choices with respect to viewing time, the impact of *Inspector Montalbano* on tourist inflows could be comparable to looking at an online advertisement

[32] Admittedly, this is a rather approximate back-of-the-envelope calculation as data on *Inspector Montalbano* ratings across countries and time are not available.

for an extra 7 minutes (Valletti and Veiga, 2021). Overall, the larger magnitudes of the effects we observe are likely due to few key differences between entertainment media and traditional ads. In our case, the implicit advertisement of the filming locations is embedded within a well-received entertainment product, while traditional ads are typically considered a nuisance (Anderson and Gabszewicz, 2006). Furthermore, the series features several episodes that last around one hour each. As such, the length and repetition of the message may help amplify its effect with respect to the one of traditional ads.

Finally, in terms of the *tourism multiplier*—in line with the estimates of Faber and Gaubert (2019) on Mexican municipalities—we show that a 10% increase in total tourist expenditure translates into a 4.7% increase in municipal income. This boost in municipal income also came with a shift of taxpayers from lower to higher income brackets and, as expected, created more jobs and firms in the tourist sector.

Several policy implications emerge from our findings on media and tourism multipliers. While identifying the successful features of a media product is clearly beyond the scope of the paper, *Inspector Montalbano* did showcase attractive elements of the local destinations, such as natural and historical landscapes and local cuisine. As such, our results provide a possible economic rationale for granting public subsidies for film productions (European Commission, 2014; KOFIC, 2020).[33] All in all, this paper suggests that both entertainment media and tourism can be powerful tools for boosting local economic development.

[33]In order to access public subsidies under this conditionality clause, public authorities would require a minimum amount of shooting days in a given location.

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Figures and Tables

Figure 1: Montalbano Municipalities

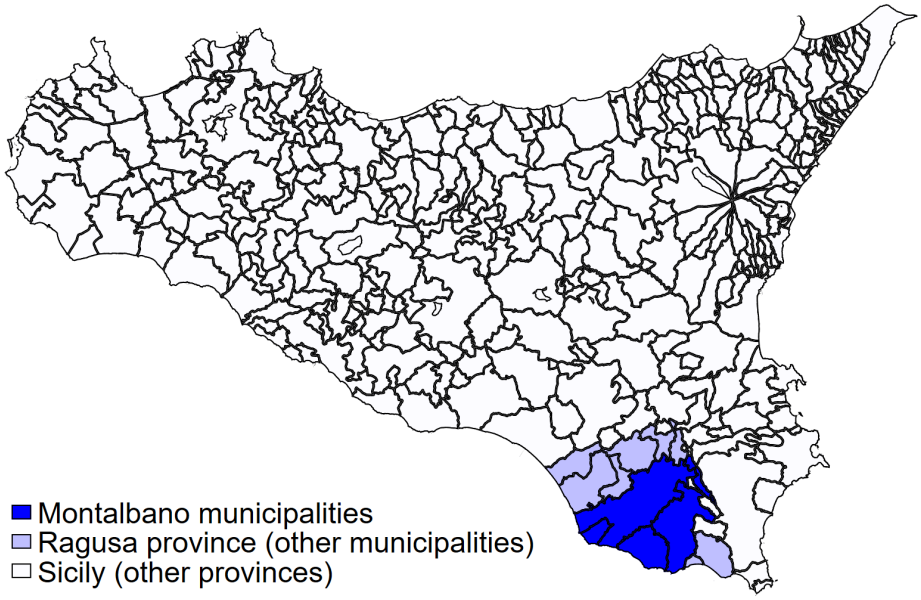
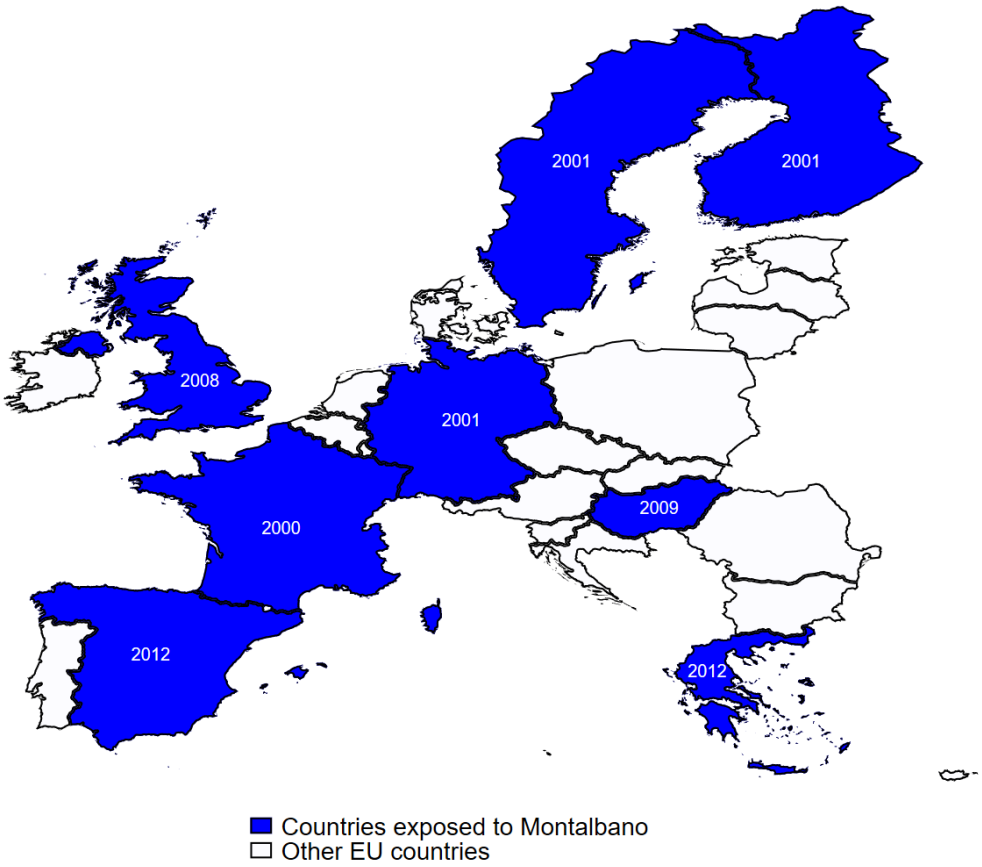
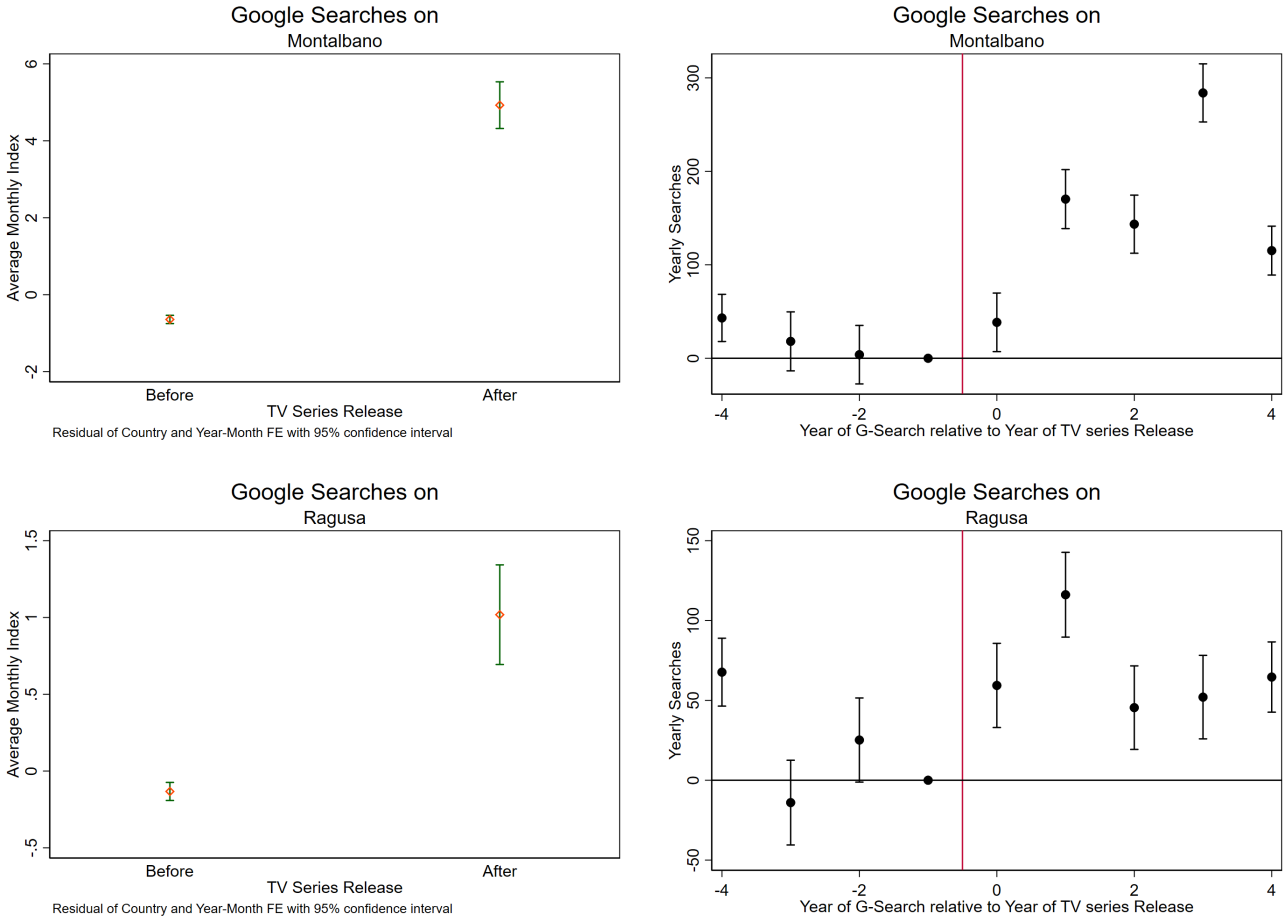


Figure 2: Countries exposed to Montalbano



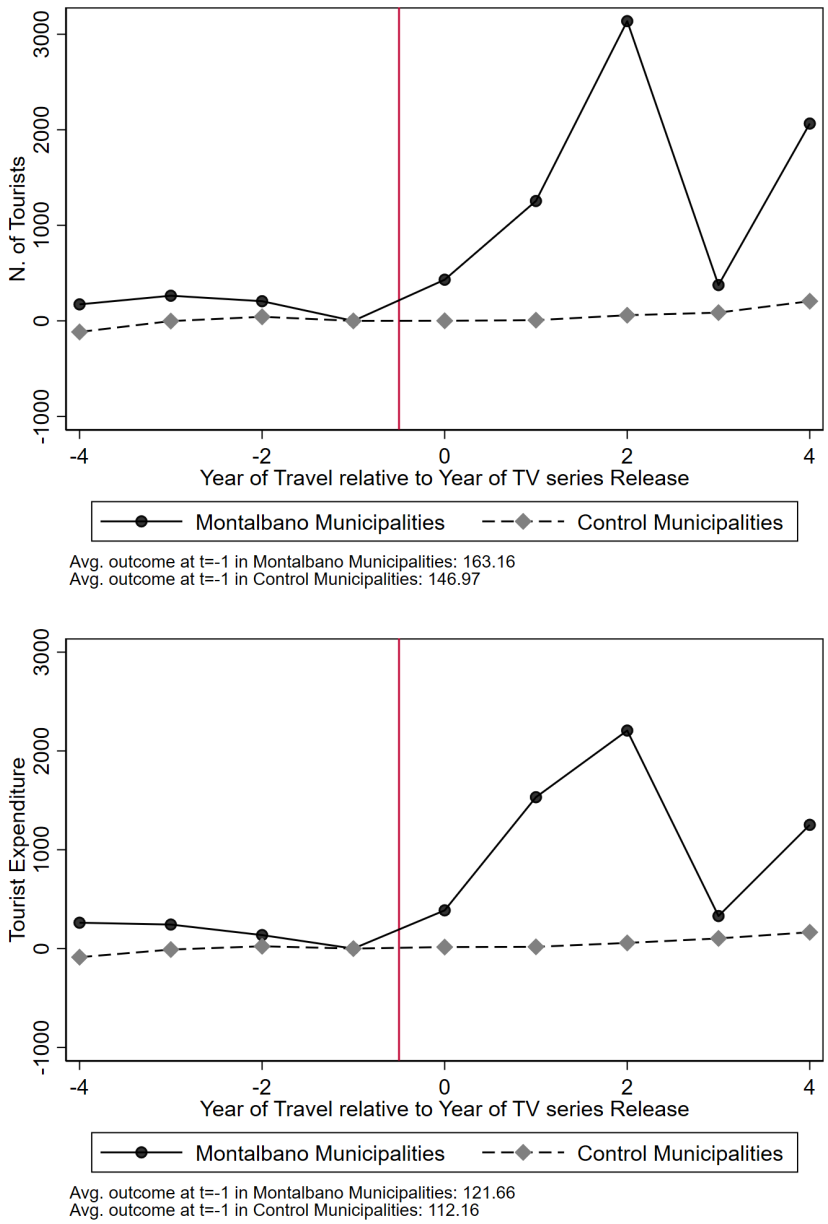
Note: The graph shows the map of EU countries (excluding Italy) in 2017. Darker (blue) areas correspond to countries exposed to the *Montalbano* TV series over our sample period (1997-2017). The number inside the dark areas refer to the year of the TV series release.

Figure 3: Google-trends



Note: Figures refer to G-trends data on the keywords "Montalbano" and "Ragusa" from 2004 to 2017. Left-side figures show the average monthly residual of Google Trends search volumes in origin countries with respect to the country fixed effects (to account for the non-comparability of G-trends hits across countries) and year-month fixed effects (to account for seasonality). The left panel compares the mean (with confidence intervals) of such residual in the period before the TV series release and after. Right-side figures show event-study estimates at the yearly-level with country and year fixed effects.

Figure 4: Tourism Trends



Note: The graph shows leads and lags of the difference in the mean number of tourists (left panel) and in the mean tourist expenditure (right panel) in *Montalbano* municipalities (solid line) and in control municipalities (dashed line) with respect to the timing of the *Montalbano* series release.

Figure 5: Spillovers - Treatment Groups

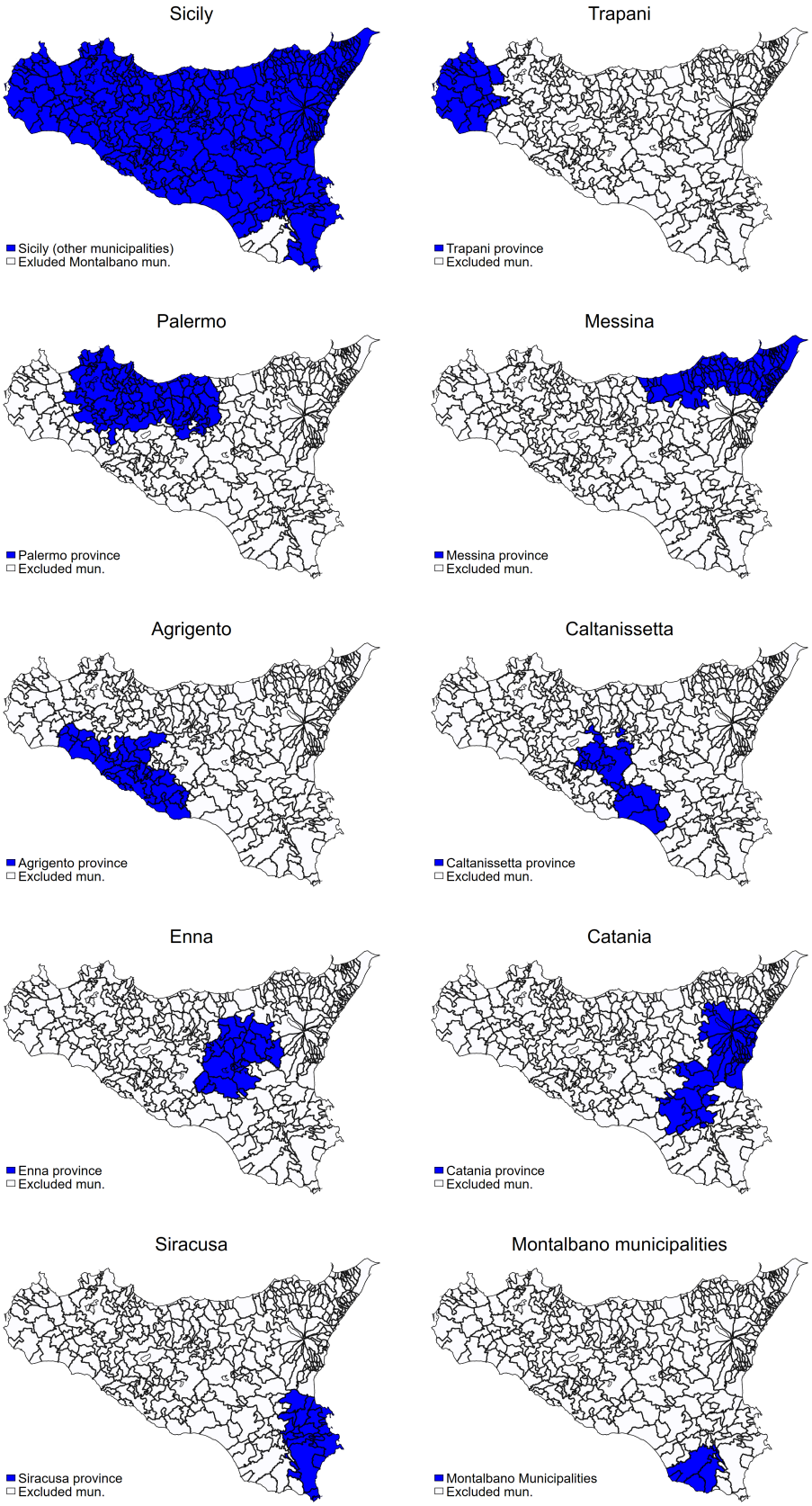


Figure 6: Event Study: Number of Tourists & Tourist Expenditure

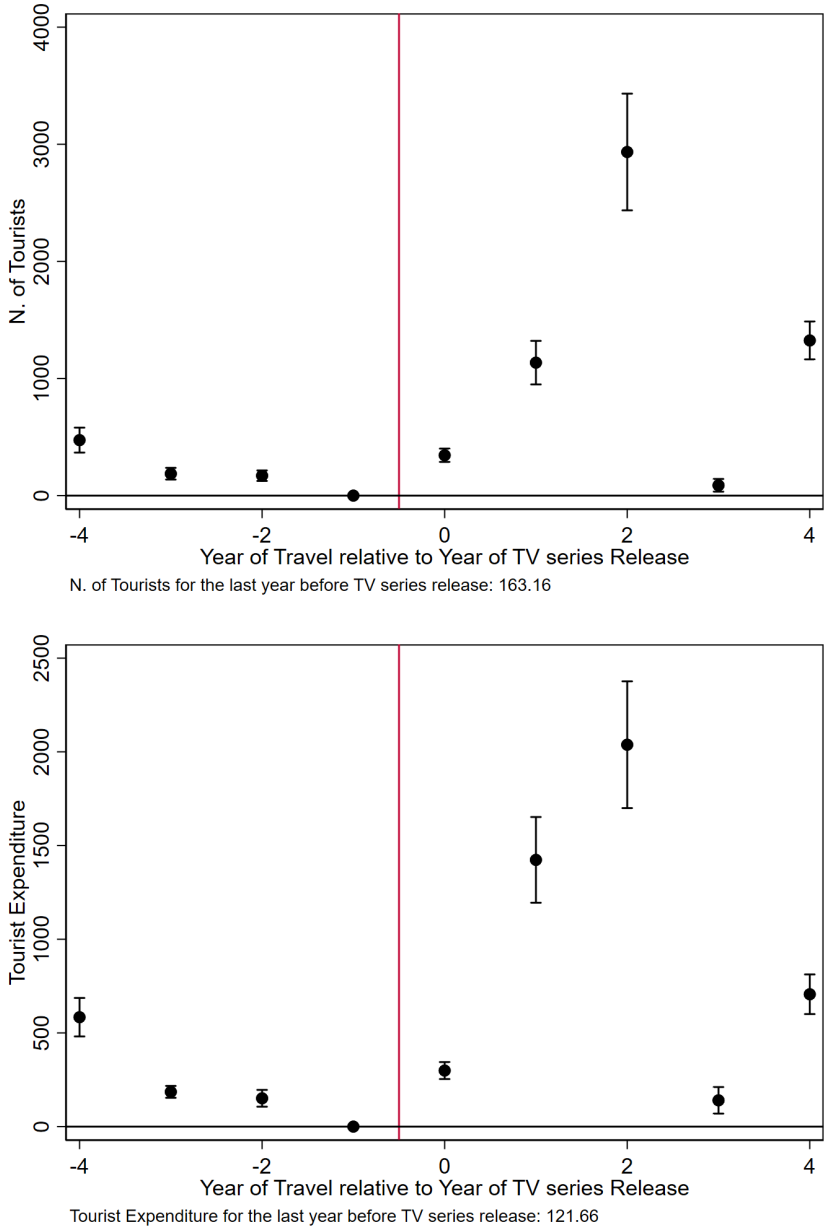


Figure 7: Random Inference Test: N. of Tourist

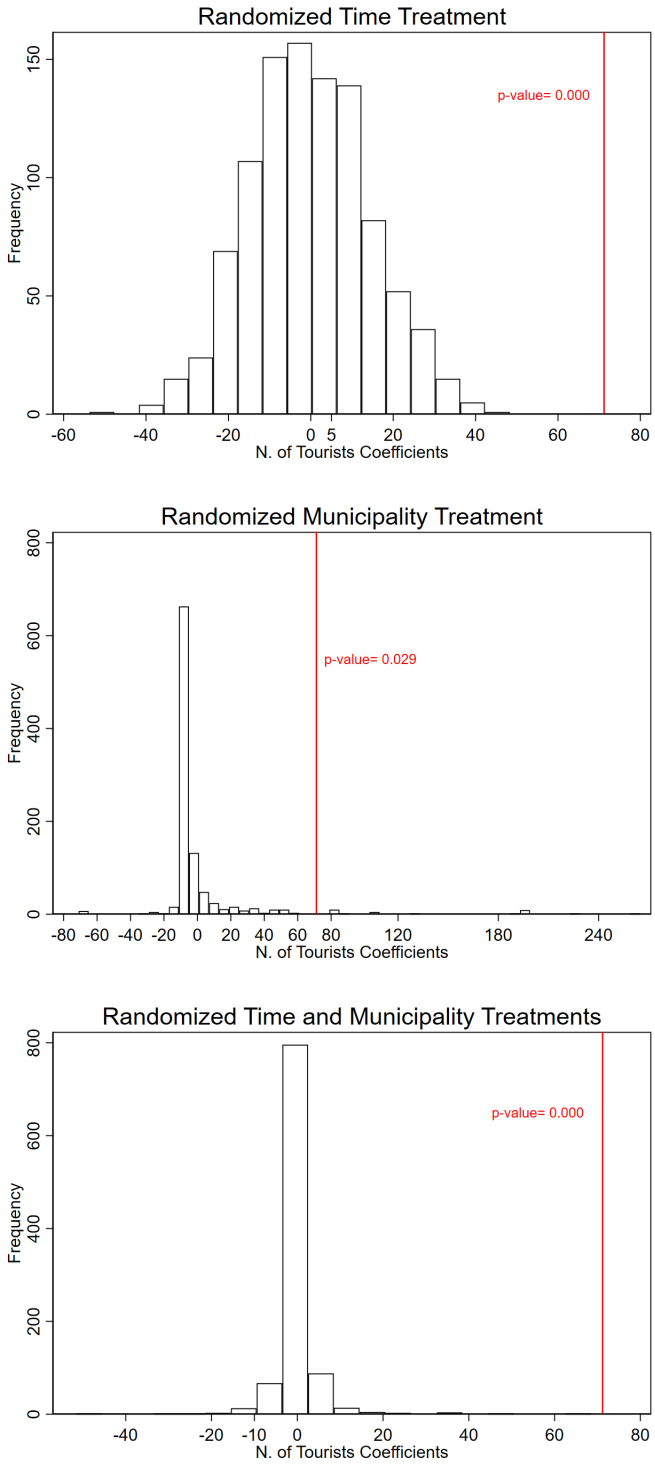


Figure 8: Random Inference Test: Tourist Expenditure

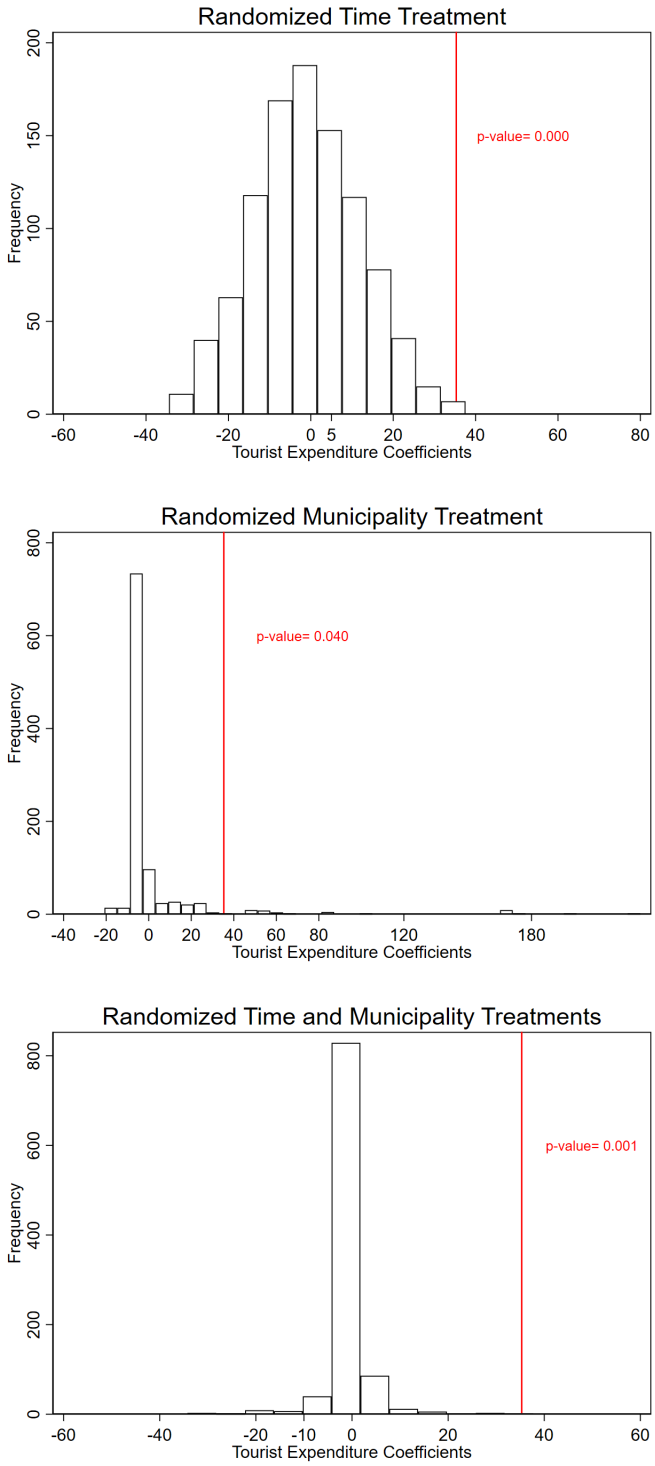


Table 1: Randomization and Balance Tests

	Randomization Test	Balance Test
Demo & Geographic Characteristics:		
Resident population	0.000	26424
	(0.000)	(20963)
Share of population aged 20-34 y.o.	0.291	0.010
	(0.267)	(0.010)
Share of population aged above 65 y.o.	-0.081	-0.022
	(0.098)	(0.026)
Share of population with a high school/university diploma	0.053	0.021
	(0.080)	(0.032)
High level of urbanization	-0.011	-0.096
	(0.017)	(0.148)
Totally montaneous territory	0.009	0.227
	(0.010)	(0.251)
Partially montaneous territory	0.002	0.038
	(0.012)	(0.206)
Non montaneous territory	-0.014	-0.264
	(0.012)	(0.221)
Economic Characteristics:		
Tot. Personal Income per capita	0.000	775.08
	(0.000)	(545.33)
N. of production units	0.000	1,763
	(0.000)	(1,096)
N. of non profit organizations	0.000	119.9
	(0.000)	(73.66)
N. of employees in non profit organizations	0.000	232.9
	(0.000)	(217.5)
Tourism Characteristics:		
N. tourists per capita	0.001	0.008
	(0.013)	(0.196)
Total tourist expenditure per capita	0.000	20.51
	(0.000)	(162.82)
N. of firms in touristm sectors	0.000	82.90
	(0.000)	(50.43)
N. of employees in tourism sectors	0.000	273.74
	(0.000)	(177.48)
Observations	390	390

Note: All the variables refer to census year 2001. Randomization test is computed regressing the instrument on each variable. Balance test is computed regressing each variable on the instrument. Standard errors in parentheses. The variable "N. tourists per capita" refers to the total number of tourists from European Union countries visiting a municipality in 2001 (source: Bank of Italy), divided by the resident municipal population in 2001. The variable "Tourist expenditure per capita" refers to the total expenditure of tourists from European Union countries in the municipality in 2001 (source: Bank of Italy), divided by the resident municipal population in 2001. *, **, *** indicate statistical significance at 10%, 5%, and 1% level, respectively.

Table 2: Media & Tourisms

	(1) Number of Tourists	(2) Number of Tourists	(3) Tourist Expenditure	(4) Tourist Expenditure
Montalbano mun. × Country treated	71.188***	71.188***	35.312***	35.312**
	(4.365)	(13.917)	(2.958)	(15.769)
Observations	2,653,560	2,653,560	2,653,560	2,653,560
Country-Municipality FE	YES	YES	YES	YES
Country-Time FE	YES	YES	YES	YES
Municipality-Time FE	YES	YES	YES	YES
SE clustered at Country & LA	YES	NO	YES	NO
SE Conley	NO	YES	NO	YES

Note: Time horizon 1997-2017. Tourist expenditure is reported in thousands of euros. Columns (1) and (3) and (5): standard errors clustered at Country and Local Area levels in parentheses. Columns (2) and (4): Conley standard errors corrected for spatial correlation among municipalities that fall within 50 km from each other, and for serial correlation up to 6 months, in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3: Media & Tourisms: Robustness Check

	(1) Years since Montalbano release	(2) Only EU 2000 Countries	(3) Drop Provincial Capitals	(4) Pre-2013	(5) Poisson	(6) *Tripadvisor* Data	(7) N. of Nights
Panel A: Number of Tourists							
Montalbano Mun. × Years since release	9.567***						
	(0.701)						
Montalbano Mun. × Country Treated		69.011***	26.196***	61.471***	0.657***	0.702***	0.331***
		(4.371)	(1.411)	(5.040)	(0.100)	(0.126)	(0.023)
Panel B: Tourist Expenditure							
Montalbano Mun. × Years since release	2.061***						
	(0.390)						
Montalbano Mun. × Country Treated		38.632***	13.228***	33.434***	-	-	-
		(3.122)	(0.980)	(3.941)			
Observations	2,653,560	1,375,920	2,592,324	2,021,760	89,943	2,021,760	2,592,324
Country-Municipality FE	YES	YES	YES	YES	YES	YES	YES
Country-Time FE	YES	YES	YES	YES	YES	YES	YES
Municipality-Time FE	YES	YES	YES	YES	YES	YES	YES

Note: Time horizon: 1997-2017 for Columns 1-2-3-5 and 7; 1997-2012 for Column 4. Tourist expenditure is reported in thousands of euros. In Panel A: Column 5 reports the estimate of a Poisson model; Column 6 reports the estimated effect on the Number of Tourists using the *Tripadvisor* dataset (time horizon 2002-2017); Column 7 reports the estimated effect when considering the number of nights as a dependent variable. Standard errors clustered at Country and Local Area levels in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Media & Tourisms: Spillover Effects

Treated Groups:	(1) Sicily (no Montalbano municipalities)	(2) Trapani province	(3) Palermo province	(4) Messina province	(5) Agrigento province
Panel A: Number of Tourists					
Treated Mun. × Country Treated	5.624	6.845	10.632	4.356	-8.795
	(3.412)	(5.497)	(7.911)	(4.126)	(5.214)
Panel B: Tourist Expenditure					
Treated Mun. × Country Treated	5.271*	6.502	9.621	4.043	-1.860
	(2.967)	(4.055)	(6.724)	(3.663)	(1.121)
Observations	17,363,808	14,900,760	15,295,392	15,472,296	15,030,036

Treated Groups:	(6) Caltanissetta province	(7) Enna province	(8) Catania province	(9) Siracusa province	(10) Montalbano municipalities
Panel A: Number of Tourists					
Treated Mun. × Country Treated	-2.669	1.005	10.715*	21.003*	77.056***
	(1.674)	(2.265)	(5.923)	(12.173)	(1.924)
Panel B: Tourist Expenditure					
Treated Mun. × Country Treated	-0.268	1.153	7.333	13.198*	40.794***
	(1.364)	(1.749)	(4.482)	(7.481)	(1.176)
Observations	14,887,152	14,873,544	15,132,096	14,880,348	14,764,680
Country-Municipality FE	YES	YES	YES	YES	YES
Country-Time FE	YES	YES	YES	YES	YES
Municipality-Time FE	YES	YES	YES	YES	YES

Note: Time horizon 1997-2017. Tourist expenditure is reported in thousands of euros. Each column is titled with the name of the province or group of municipalities treated. Control group of Italian southern regions: Abruzzo, Basilicata, Calabria, Campania, Molise, Puglia, and Sardegna. Standard errors clustered at Country and Local Area levels in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5: Tourism and Economic Development

Estimation: IV	(1) Total Income	(2) Income below 15K	(3) Income 16K-25K	(4) Income 26K-55K	(5) Income 56K-75K	(6) Income above 75K
Total TE	25,212***	-1,247***	6,735***	14,723***	1,626***	3,375***
	(2,750)	(165)	(980)	(1,569)	(161)	(333)
Observations	7,020	7,020	7,020	7,020	7,020	7,020
Municipality FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F-stat of the Excl. Instrument	49.60	49.60	49.60	49.60	49.60	49.60

Note: Time horizon 2000-2017. Total TE (Total Tourist Expenditure) is reported in thousands of euros. Outcome variables refer to total taxable income in the municipality-year (Column 1) or the total personal income within a given income class (Columns 2-6). Standard errors clustered at Local Area level in parentheses. Table reports instrumental variable estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Tourism and Economic Development - Robustness

Estimation: IV	(1) Only EU 2000 Countries	(2) Drop Provincial Capitals	(3) Pre-2013	(4) Weight Country Distance	(5) Weight Country Population	(6) Weight Country GDP
Total TE	21,609***	30,539***	44,793***	25,188***	25,477***	24,669***
	(1,862)	(4,471)	(5,049)	(2,790)	(2,813)	(2,609)
Observations	7,020	6,858	5,070	7,020	7,020	7,020
Municipality FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F-stat (Excluded Instrument)	71.25	50.76	57.16	48.35	48.65	52.31

Note: Time horizon 2000-2017 for Column 1-2 and 4-6. Time horizon 2000-2012 for Column 3. Total TE (Total Tourist Expenditure) is reported in thousands of euros. Standard errors clustered at the Local Area levels in parentheses. Table reports IV estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Tourism and Economic Development: Extensive and Intensive Margins

Panel A: Extensive Margin	(1) Total Taxpayers	(2) Taxpayers below 15K	(3) Taxpayers 16K-25K	(4) Taxpayers 26K-55K	(5) Taxpayers 56K-75K	(6) Taxpayers above 75K
Total TE	0.2359***	-1.4142***	0.3235***	0.4324***	0.0253***	0.0316***
	(0.0275)	(0.1911)	(0.0489)	(0.0465)	(0.0025)	(0.0031)
Panel B: Intensive Margin	(7) Total Income *per taxpayer*	(8) Income *per taxpayer* below 15K	(9) Income *per taxpayer* 16K-25K	(10) Income *per taxpayer* 26K-55K	(11) Income *per taxpayer* 56K-75K	(12) Income *per taxpayer* above 75K
Total TE	0.0323**	-0.0119	-0.0159	0.0462**	-0.2529*	-1.2297***
	(0.0143)	(0.0219)	(0.0106)	(0.0194)	(0.1288)	(0.4528)
Observations	7,020	7,020	7,020	7,020	7,020	7,020
Municipality FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F-stat of the Excl. Instrument	49.60	49.60	49.60	49.60	49.60	49.60

Note: Time horizon 2000-2017. Total TE (Total Tourist Expenditure) is reported in thousands of euros. Panel A: Outcome variables refer to the number of taxpayers related to each income class. Panel B: Outcome variables are computed as the ratio between income and number of taxpayers of each income class. Standard errors clustered at Local Area level in parentheses. Table reports instrumental variable estimates. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Tourism and Economic Development: Tourism Sector

Estimation Method: IV	(1) N. of Firms Tourism Sectors	(2) N. of Workers Tourism Sectors
Total TE	0.0282***	0.0817***
	(0.0034)	(0.0091)
Observations	5,850	5,850
Municipality FE	YES	YES
Year FE	YES	YES
F-stat of the Excluded Instrument	53.56	53.56

Note: Time horizon 2001, and 2004-2017. Data on the number of firms and workers in the tourism sector at the year-municipality level are available from 2004, data for the year 2001 refer to census data. Total TE (Total Tourist Expenditure) is reported in thousands of euros. Standard errors clustered at Local Area level in parentheses. Table reports instrumental variable estimates. *** p<0.01, ** p<0.05, * p<0.1

Appendix. Additional Tables

Table A.1: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel A: Whole Sample					
N. of Tourists	7.034	187.942	0	61553.078	2653560
N. of Nights	0.126	2.736	0	493	2653560
Tourist Expenditure (thousands)	5.601	155.27	0	42664.191	2653560
N. of Tourists (Tripadvisor)	0.05	1.085	0	208	2021760
Panel B: Treated Countries & Treated Municipalities					
N. of Tourists	99.498	700.971	0	25742.539	8064
N. of Nights	1.371	8.009	0	240	8064
Tourist Expenditure (thousands)	70.697	590.988	0	25163.711	8064
N. of Tourists (Tripadvisor)	1.045	5.941	0	166	6144
Panel C: Treated Countries & Control Municipalities					
N. of Tourists	17.775	315.451	0	61553.078	778176
N. of Nights	0.315	4.466	0	493	778176
Tourist Expenditure (thousands)	14.202	258.842	0	42664.191	778176
N. of Tourists (Tripadvisor)	0.118	1.861	0	208	592896
Panel D: Control Countries & Treated Municipalities					
N. of Tourists	7.888	138.297	0	13904.1	19152
N. of Nights	0.149	2.14	0	127	19152
Tourist Expenditure (thousands)	5.71	92.023	0	6460.986	19152
N. of Tourists (Tripadvisor)	0.132	0.795	0	25	14592
Panel E: Control Countries & Control Municipalities					
N. of Tourists	2.099	79.778	0	28384.32	1848168
N. of Nights	0.04	1.412	0	307.5	1848168
Tourist Expenditure (thousands)	1.694	68.762	0	24654.119	1848168
N. of Tourists (Tripadvisor)	0.016	0.256	0	27	1408128

Notes: Bank of Italy data refer to the time horizon 1997-2017. *Tripadvisor* data refer to the time horizon 2002-2017. Treated countries are those exposed to the Montalbano series release. Specifically, Finland, France, Germany, Greece, Hungary, Spain, Sweden, and United Kingdom, as reported in Figure 2. Treated municipalities are those in which the series was staged as it is reported in figure 1.

Table A.2: Tourism and Economic Development Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Panel A: Whole Sample					
Total Income (thousands)	108293	414886	1448	7370759	7020
Total Taxpayers	7352	22234	128	373757	7020
Total Income per taxpayer	12317	2724	5473	26225	7020
N. of Firms in Tourism Sector	49	138	0	2459	5850
N. of Workers in Tourism Sector	161	540	0	9943	5850
Total TE (thousands)	1981	13517	0	371436	7020
Panel B: Treated Municipalities					
Total Income (thousands)	374366	275235	42974	858142	72
Total Taxpayers	26428	16309	5978	51381	72
Total Income per taxpayer	12914	2575	7189	17686	72
N. of Firms in Tourism Sector	204	138	33	521	60
N. of Workers in Tourism Sector	710	569	70	2129	60
Total TE (thousands)	8707	14568	0	72612	72
Panel C: Control Municipalities					
Total Income (thousands)	105535	415210	1448	7370759	6948
Total Taxpayers	7154	22202	128	373757	6948
Total Income per taxpayer	12311	2725	5473	26225	6948
N. of Firms in Tourism Sector	48	137	0	2459	5790
N. of Workers in Tourism Sector	155	537	0	9943	5790
Total TE (thousands)	1912	13489	0	371436	6948

Notes: Bank of Italy data refer to the time horizon 2000-2017. Variables on the number of firms and workers in the tourism sector are built on data from the Bank of Italy, time horizon 2001, and 2004-2017. Data on the number of firms and workers in the tourism sector at the municipality-year level are available from 2004, data for the year 2001 are census data. Balanced panel at the municipality-year level. Total TE (Total Tourist Expenditure) is reported in thousands of euros as well as total personal income. Treated municipalities are those in which the series was staged as it is reported in figure 1.

Table A.3: Estimation by Cohorts of treated

	(1) Cohort 1	(2) Cohort 2	(3) Cohort 3	(4) Cohort 4	(5) Cohort 5
Panel A: Number of Tourists					
Montalbano mun. × Country treated	1,720.212***	1,336.325***	352.037***	1,106.939***	460.752***
	(172.827)	(129.314)	(24.243)	(18.568)	(10.406)
Panel B: Tourist Expenditure					
Montalbano mun. × Country treated	1,207.390***	302.874***	144.351***	465.538***	330.525***
	(121.627)	(27.725)	(13.181)	(12.402)	(3.823)
Observations	171,990	171,990	171,990	163,800	163,800
Country-Municipality FE	YES	YES	YES	YES	YES
Country-Time FE	YES	YES	YES	YES	YES
Municipality-Time FE	YES	YES	YES	YES	YES

Note: Time horizon 1997-2017. Panel data at the country-municipality-year level. Tourist expenditure is reported in thousands of euros. Each cohort of estimation includes only control countries and countries with the same starting-treatment year. The starting-treatment year is defined as the year of the first summer holiday season after the release of the series in country c. That is, it is equal to the release year if the month of release in country c is before September. Instead, it is equal to year after the release if the month of release in country c is after August. Accordingly, in terms of treated countries, Cohort-1 includes France and Sweden (2001), Cohort-2 includes Finland and Germany (2002), Cohort-3 includes United Kingdom and Hungary (2009), Cohort-4 includes Spain (2012), and Cohort-5 includes Greece (2013). Standard errors clustered at Country and Local Area levels in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Tourism and Economic Development - OLS

Estimation: OLS	(1) Total Income	(2) Income below 15K	(3) Income 16K-25K	(4) Income 26K-55K	(5) Income 56K-75K	(6) Income above 75K
Total TE	2,506**	-539***	-356**	2,080**	360**	959**
	(1,052)	(161)	(159)	(804)	(148)	(391)
Observations	7,020	7,020	7,020	7,020	7,020	7,020
Municipality FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Note: Time horizon 2000-2017. Total TE (Total Tourist Expenditure) is reported in thousands of euros. Standard errors clustered at the Local Area levels in parentheses. Table reports OLS estimates. *** p<0.01, ** p<0.05, * p<0.1