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ABSTRACT: This paper examines the lasting impact of tourism specialization on per capita income in Spanish municipalities, aiming to understand the factors driving these effects. We employ two distinct approaches. The first one focuses on tourism development since the initial boom in the 1960s and relies on cross-sectional variation in tourism exposure related to amenities like beaches and weather for identification. The second method looks at a later wave of tourism development in the 1990s, using a shift-share analysis that combines the share of residents from tourist-source countries in each municipality with the growth rate of tourists from these countries throughout Spain. The findings indicate that municipalities with the highest growth in tourism specialization now exhibit lower per capita income. A municipality experiencing an increase in tourism per capita over time equal to the sample median has a per capita income between 21% and 22% lower as of 2019, depending on the approach used. This decline in income is associated with an increase in temporary job contracts, with a decrease in industrial employment, and with lower levels of educational attainment.

JEL Codes: R11, R23, Z32
Keywords: Tourism specialization, local economic growth, long-term effects, local labor markets.

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1 Introduction

The tourism industry plays a crucial role in generating income for many countries and is often considered a significant driver of economic growth. Before the COVID-19 pandemic, the World Travel & Tourism Council (WTTC) reported that tourism contributed to one in every four new jobs globally, accounting for 10.3% of both total employment and global GDP.[1] As a result, both developed and developing nations heavily invest in tourism infrastructure and promotional efforts, increasingly relying on the revenues it generates.

The impact of tourism on economic development is diverse, with both positive and negative effects on either local economies or countries as a whole. While tourism can lead to positive changes by redistributing economic activities across sectors, creating jobs, and attracting foreign exchange and investments (Song et al., 2012), some studies point out its drawbacks, including reduced productivity, potential displacement of industries undergoing technological progress, and a prevalence of temporary and low-skilled employment and, therefore, lower wages (Parrilla et al., 2007; Sequeira and Maças Nunes, 2008; Arezki, 2009; Brida et al., 2016).

This paper brings new evidence to the ongoing discussion about the lasting effects of tourism on local economies. It does so by presenting new empirical findings regarding the localized impact of tourism specialization on per capita income levels in Spanish municipalities. The study also seeks to delve into the mechanisms behind this impact, including its effects on job stability, sector displacement, and education levels. Spain provides an ideal backdrop for this research due to its remarkable surge in tourism since the 1960s, with the industry constituting a significant portion of employment (13% in 2019). In that year alone, Spain welcomed over 83 million international visitors, generating 71.2 billion euros in tourism revenue, making it one of the world's top tourist destinations. The country's favorable climate and scenic beaches are major draws for tourists, leading to a concentration of tourism in warmer and coastal regions. In 2019, coastal municipalities hosted more than 70% of all tourism activity, as reported by the National Statistics Institute.

[1] Source: https://wttc.org/Research/Economic-Impact (consulted on June 3, 2022).

We use two distinct approaches in our study. The first one examines tourism development since the initial tourism boom in the 1960s, measuring per capita tourism growth from 1960 to 2019 using data from the local business tax base of tourism-related activities. The second method looks at the later wave of tourism development in the 1990s, triggered by external changes such as improved air accessibility and the introduction of new accommodation options. In this approach, per capita tourism is approximated by the number of overnight stays in hotels per capita. By combining these two approaches we are able to provide evidence from two different periods and using different identification strategies.

A key challenge in examining the causal impact of tourism on economic outcomes is the difficulty of separating the effects of tourism from other factors that could simultaneously influence overall economic growth in a tourist destination. For example, local investments and infrastructure development may independently contribute to economic growth in a municipality focused on tourism, apart from the influence of the tourism industry. This complexity makes it challenging to pinpoint the specific effects of tourism on economic outcomes, as tourism effects may be entangled with other contributing factors.

To address the potential endogeneity issue between tourism growth and local economic development, I adopt two identification strategies. First, when studying tourism development for the whole period 1960-2019, I employ a methodology that relies on cross-sectional variation in tourism exposure, using the presence of a beach as an instrument for tourism growth. This is inspired by Fabert and Gaubert (2019) and draws insights from the tourism literature which highlights the significance of local natural amenities in influencing tourism activities. Because there aren't so many coastal municipalities in Spain without access to a beach, what we do is to compare municipalities with sandy beaches (treated municipalities) to those located inland (control municipalities) within coastal provinces.

Additionally, I take leverage of the variation in the intensity of beach amenities along the Spanish coastline. More precisely, I use aerial photos from the PNOA hist´orico dataset (1956-57, Instituto Geográfico Nacional) to measure the surface area of sandy beaches across Spanish municipalities—specifically, the fraction of the onshore coastline covered by beach. I also consider weather features to further measure tourism attractiveness. This allows me to account for differences between the treated and control municipalities in exposure to tourism that are larger in places where beach amenities are stronger.

Second, when examining the second wave of tourism development in the 1990s, we adopt an identification strategy using a shift-share analysis. In this period, changes in the tourism industry were influenced by European policy regulations that improved air accessibility and facilitated the entry of low-cost airlines, as well as by the introduction of platforms like Airbnb. These changes had a significant impact on tourism inflows to Spain and were arguably not driven by the tourist sector's situation in Spain, making them exogenous. To leverage this context, I observe that municipalities with a higher number of residents from tourist-source countries in 1996 experienced a more substantial increase in the number of overnight stays in hotels over the following years. The strategy used involves distributing the positive surge in tourism inflows by source country across municipalities based on their pre-established composition of residents by nationality. This method is similar to the shift-share analysis proposed by Bartik (1991). Our shift-share instrument combines the share of residents from tourist-source countries in 1996 in each municipality with the growth rate of overnight stays by tourists from these countries across Spain for the period 1997-2019. Notice that differently than in the first approach, the sample used here includes only beach municipalities and exploits between-municipality differences in the exposure to tourism development drivers.

Using both research designs, the results indicate that municipalities with the highest growth in tourism specialization now exhibit lower levels of per capita income. Specifically, as of 2019, a municipality experiencing a median increase in tourism per capita over the period has a per capita income a 22,2% lower–when using the first approach, based on accessibility to beach amenities- and a 21,5% lower –when using the second approach, that relies on a shift-share analysis. I also investigate the potential channels through which tourism negatively affects income per capita. I find that tourism led to a shift in the local economy, resulting in a greater specialization in the service sector, as well as an increase in demand-related industries such as construction, real estate, hotels, and foodservice. Tourism also resulted in a decrease in manufacturing employment, lower educational attainment, and ultimately, higher job instability, since the tourism sector is more reliant of part-time and temporary contracts.

This paper contributes to several strands of literature. First, this analysis adds to the list of papers studying the causal impact of tourism on economic development. The paper complements the work conducted by Faber and Gaubert (2019). Their study focuses on the long-term effects of tourism on the development in Mexico. However, it is essential to acknowledge the distinctions between their research and mine. The economic context differs significantly; while Faber and Gaubert's analysis pertains to a developing country, my investigation centers on a developed country. Also, our examination explores other outcomes related to tourism's influence besides economic activity, namely job instability and education levels. Finally, their analysis pays specific attention to general equilibrium effects and show that coastal tourism impacts manufacturing activity inland. My analysis focus on the localized effects of tourism specialization and so the aggregate effects are out of the scope of the paper. I do take care of the possible spillovers from coastal tourism towards immediate inland municipalities. This is done in order to make sure that the estimates under the first approach (which compares beach and inland municipalities) are not biased due to the contamination of the control group, but it also brings some light on the effects of tourism beyond the municipalities hosting the amenity. However, I do not find any impact for inland municipalities beyond those adjacent to the beach municipality, which are also affected negatively, but to a much lesser extent. Of course, I cannot rule out that there are spillovers over more distant municipalities and regions (e.g., hosting industries that provide inputs to the accommodation and construction sectors) or on the country on the aggregate (e.g., due to the inflow of exchange during the early period).

There are other relevant papers in this strand of literature that also focus on the localized effects of tourism on development. Noticeable examples are the works by Nocito et al. (2021) and González & Surovtseva (2020), for Italy and Spain, respectively. The last paper focus on the short-time impact of tourism shocks on employment at the provincial level in Spain. The difference between the second paper and mine is that I focus on the long-run effects of tourism and I look at smaller geographical units, the municipalities. There is evidence that tourism is a highly localized phenomenon, as tourists are attracted by immobile resources, and consu-me mainly within the place they visit (Bronzini et al. 2019). Moreover, in Spain, there is a very high concentration of tourists in specific municipalities within a region.[2] All of this suggests that the municipality should capture the effect of tourism on local outcomes more accurately than the region or the province. Interestingly, and as already discussed, the results of the paper hold only for municipalities located very close to shore.

Secondly, this work contributes to a broad literature exploring the impact of structural transformation. Unlike most studies focusing on labor reallocation from agriculture to non-agriculture in developing countries (Makarski et al., 2022; Hjort and Poulsen, 2019; Bustos et al., 2016; Gollin et al., 2016; Herrendorf et al., 2014; McMillan and Rodrik, 2011; Kuznets, 1973), this paper centers on a developed country. Utilizing labor income data, it investigates the within-country impact of structural transformation, a departure from the focus on productivity gains in poorer nations where income data from population censuses is often unavailable. Additionally, this study connects with literature exploring "Dutch disease" effects associated with natural resource booms, exploiting both between and within-country variation (e.g., Allcott and Keniston, 2018; Caselli and Michaels, 2013; Corden, 1984; Corden and Neary, 1982). While focusing on tourism as a unique form of natural resource boom, the economic questions addressed align closely with existing research.

The main contributions of this paper are as follows: firstly, an examination of the long-run impact of tourism on a developed country heavily reliant on tourism, where many municipalities depend on tourism income. Secondly, the use of unique municipality-level datasets to track localized changes in income and other outcomes, a feat not feasible with regional or country-level data. Thirdly, the provision of direct evidence on the mechanisms through which tourism affects socioeconomic outcomes, such as increased temporary contracts and changes in the sectoral composition of municipalities. Lastly, it stands as the first study estimating the long-term effects of tourism on a tourism-oriented economy, a crucial exploration given potential differences between short and long-term effects.

[2]For example, according to the National Statistic Institute, in 2019 the municipality of San Bartolomé absorbs the 67% of the total tourist presences of Gran Canaria (and the 12,7% of Spain) and Benidorm the 64% of Alicante (11,6% of the national total).

The paper is structured as follows: section 2 outlines the theoretical expectations behind the results. Section 3 delves into the Spanish institutional context, emphasizing the role of tourism in the economy. Section 4 describes the data and summarizes the primary variables used in the analysis. Section 5 details the empirical strategy, while section 6 presents the main findings and robustness checks. Finally, section 7 concludes the paper.

2 Theoretical expectations

The central hypothesis of this study posits that municipalities with tourism amenities, particularly those specializing in tourism, experience long-lasting impacts on their economic outcomes. Specifically, it is argued that tourism-specialized municipalities tend to exhibit lower long-term per capita income. This hypothesis suggests that the observed lower income levels are not incidental but stem from distinct mechanisms inherent to tourism specialization.

Drawing parallels with the natural resource boom literature, this analysis likens the tourism surge in Spain during the 1960s to a boom in commodity exports typically seen in economies rich in natural resources. Regions endowed with accessible natural amenities such as beaches, high temperatures, and sunny weather witnessed a transformative influx of tourism. This influx was akin to the discovery of new applications for these 'natural resources,' leading to a fundamental reshaping of local economies and fostering a shift towards service sector specialization.

As outlined in the natural resource theory (Corden, 1984; Corden and Neary, 1982), the availability of such natural resources tends to elevate marginal labor productivity in the tourism sector, thereby increasing labor demand. Given the labor-intensive nature of tourism and non-tradable sectors, employment in these specialized municipalities becomes heavily concentrated in the service sector. This shift curtails opportunities in traditional sectors like industry and agriculture, leading to a reduced production of tradable commodities. Conversely, it may boost the production of non-tradable commodities and services, alongside sectors like construction, which are closely linked to the tourism industry.

While tourism can bolster a country's economy in the short term, enhancing overall economic conditions, its long-term impact remains a subject of debate.

Initially, tourism can drive structural economic shifts, particularly in economies reliant on primary sector activities, redirecting activity towards manufacturing and services. Benefits include increased foreign exchange earnings, job creation, local investments, exploitation of economies of scale, and dissemination of technical knowledge (Song et al., 2012).

However, some studies highlight potential drawbacks, notably the phenomenon of "Dutch Disease," where tourism's low productivity may displace more technologically advanced sectors, impeding broader economic development (Copeland, 1991; Holzner, 2011). A tourism-centric focus can skew export composition, leading to a decline in manufacturing – a sector typically associated with innovation and technological progress (Capó et al., 2007). This shift can restrict growth potential, stifling human development and productivity (Torvik, 2001). Gylfason (2001a, 2001b) further underscores this by showing how the exploitation of natural resources, often reliant on unskilled labor, can dampen long-term growth due to lower training levels.

Additionally, the tourism industry is vulnerable to demand fluctuations, impacted by external shocks such as terrorist attacks, pandemics, natural disasters, and political instability. These events can drastically affect tourist arrivals, revenue, and the economic stability of tourism-dependent countries (Enders and Sandler, 1991; Enders, Sandler, and Parise, 1992; Neumayer, 2004; González and Surovtsev, 2020).

Furthermore, critiques of the tourism sector focus on the nature of the employment it creates, often characterized by temporariness, low skill requirements, and consequently, low wages (Parrilla et al., 2007; Sequeira and Maçãs Nunes, 2008; Arezki, 2009; Brida et al., 2016). This industry frequently offers poor working conditions, unfavorable hours, and limited career progression, predominantly employing part-time, low-skilled workers, or those on temporary contracts, often at minimal wages. While job opportunities may surge during peak seasons, tourism areas typically experience high unemployment during off-peak periods.

Human capital accumulation models indicate that the increased attractiveness of low-skill jobs due to tourism may discourage further education, at least in the short term (Black et al., 2005b; Charles et al., 2015; Angelopoulos et al., 2017). With low-skill jobs offering immediate income, the opportunity cost of completing high school or pursuing higher education rises, thereby diminishing the perceived value of further education.

3 The Spanish context

Spain serves as an exceptionally suitable case study for investigating the impact of tourism on local income due to its significant reliance on tourism as a key economic driver. In comparison to other OECD countries, Spain stands out with a higher percentage of GDP and employment attributed to tourism. According to the OECD Tourism Statistics, on average, tourism constitutes 12.4% of Spain's GDP and employs 12.9% of its population, while the OECD average remains at 4.4% of GDP and 6.9% of employment.

Notably, coastal tourism dominates the tourism sector in Spain, with a staggering 70% of tourism activity concentrated in coastal regions, particularly within the 464 coastal municipalities. Despite representing only 16% of the total population, these coastal municipalities play a pivotal role in generating substantial tourism-driven economic activity.

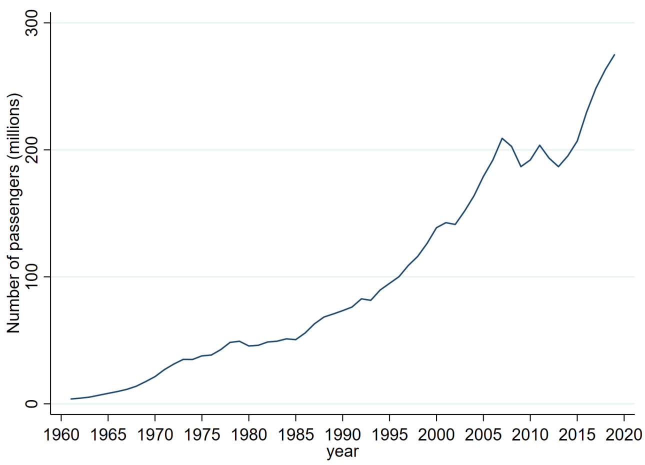
The development of tourism in Spain, particularly beach-and-sun tourism, is widely acknowledged to have started with the 'Plan de Estabilización' (Stabilisation Plan) of 1959. This plan, which included a significant devaluation of the national currency, marked Spain's return to the international markets after the dictatorship and the end of extreme autarchic policies. The effects of this plan on European tourists seeking sun and beach tourism in Spain were immediate and contributed to a sharp increase in tourism during the 1960s (Sánchez-Sánchez, 2001).[3]

Between 1997 and 2007, Spanish tourism experienced a second strong development period characterized by continuous growth in the number of international tourists (Albaladejo et al., 2020). This growth was primarily driven by exogenous

[3]The Stabilization Plan of 1959 refers to a set of economic measures that were implemented by the Spanish government from 1959 onwards. The main objective of the plan was to liberalize the Spanish markets and mark a shift away from the country's previous policies that aimed at achieving autarky. The plan was aimed at stabilizing the economy, reducing inflation, and increasing foreign investment. It involved the devaluation of the national currency, which helped to make Spanish exports more competitive on the international market.

changes in European regulations, which led to significant changes in the tourism industry in Spain including improvements in air accessibility, transportation, and the emergence of new forms of accommodation. Furthermore, this led to the introduction of low-cost airlines and the opening of new air routes. Thus, travel to Spain became more accessible and affordable for tourists from all over Europe. The number of international tourists visiting Spain increased significantly, particularly in coastal regions where sun and beach tourism are popular. Despite the increase in the number of tourists starting in the late 1990s, the real jump in growth did not occur until 2002, continuing until 2007, with the number of exits also increasing significantly in 2003 (Mason et al., 2016).[4]

Figure 3.1.: Growth trends in international tourist arrivals to Spain: 1961-2019



Notes: (2) Data represents the annual number of international tourists arriving in Spain. Two distinct phases of growth are visible: the tourism boom of the 1960s and accelerated growth in the late 1990s and early 21st century. (2) Source: National Statistic Institute (INE).

Specifically, the data in Figure 3.1 shows the numbers of international tourists arriving in Spain from 1961 to 2019, indicating a consistent growth in international arrivals since the 1960s, with several growth phases. The figure reveals two distinct periods of intense growth, the first of which was driven by the tourism boom of

[4]The impact of these exogenous shocks after the 1997 varied depending on the origin and destination of tourists. It made it easier for tourists from Europe to travel to Spain, which resulted in a significant increase in the number of visitors from European countries. As a result, coastal municipalities, which were popular destinations for beach tourism, were among the most affected by the change in European regulations.

the 1960s. The second period was characterized by an accelerated growth at the end of the 1990s and the first years of the 21st century.

According to the Statistics on Tourist Movements at the Borders (FRONTUR), the number of foreign visitors was less than 5 million in the 1960s and almost no visitors in 1950. The majority of these visitors are from Europe, accounting for 75 percent of foreign tourists, followed by US Americans (4 percent) and Russians (1.5 percent).[5] International visitors make up roughly 70 percent of the tourism activity in Spain.

4 Data

Hereafter, I describe the main datasets used in the analysis. The data covers 22 coastal provinces and 2,658 municipalities (437 are onshore and 2,221 are inland, at different distances from shore) and spans the period 1960-2019. To construct the dataset, I digitized several historical records, including agricultural censuses, education censuses, and the 'Spanish Market Yearbook' since the beginning of the tourism development. In this section, I describe the main data sources and present some descriptive statistics.

Tourism data. In the first empirical analysis, we gauge tourism growth spanning from 1960 to 2019, utilizing data derived from the local business tax base associated with tourism-related activities. These activities encompass various accommodations such as hotels, motels, hotel-apartments, inns, boarding houses, guest houses, camp sites, and apartments. It also accounts for the income generated by restaurants, cafeterias, and bars. The local business tax in Spain, known as IAE ('Impuesto sobre Actividades Económicas', or 'Licencia fiscal' before 1992) is a presumptive tax that relies on proxies of business income, such as number of workers, power capacity, building surface, or, in the case of accomodation, number of rooms. This information has been instrumental in tracking the tourist activity of each Spanish municipality since the 1960s. The data is sourced from the 'Spanish Market Yearbook - Banesto' for the period 1965-1990 and from the 'Spanish Economic Yearbook – La Caixa' for the period 1995 to 2019. This information is

[5] Britons account for 21%, Germans 13%, French 13%, Italians 5,4%, Dutch 4,4% and Belgium 3%.

available for municipalities with more than 1,000 inhabitants. Summary statistics for this variable can be found in Table A3.1 in the appendix.

To construct instruments for per capita tourism growth, I create variables related to the existence and extent of sandy beaches by utilizing aerial photos along with Geographic Information System (GIS) data. Specifically, I rely on aerial photo data from the National Geographic Institute (PNOA histórico 1956-57), featuring digital aerial orthophotographs covering the entire Spanish territory and captured in 1957. This enables the measurement of the length, width, and surface area of all beaches before tourism development took place. An excerpt of the aerial photo data is presented in Figure 3.2. Additional GIS data layers, including the administrative shape file of municipality boundaries and the positioning of the Spanish coastline, are sourced from the geostatistics division of the National Geographic Institute. The average length and width of beaches in the sample are 3700 meters and 522 meters, respectively, as illustrated in Table A3.1, panel A.

Figure 3.2.: Aerial view of Spanish coastline prior to tourism development, 1956

Notes: (1) This orthophotograph provides a snapshot of the Spanish coast and beaches before the tourism industry's development. (2) Source: PNOA Americano Serie B for 1956.

In the second empirical analysis, I focus is on the sub-sample of municipalities with beaches. To measure tourism in this sub-sample, I use the number of overnight stays in hotels at the municipal level. This data is obtained from the National Statistics Institute and covers the period from 2003 to 2019. However, it is only available for a limited number of municipalities, which is 96 out of the 437 municipalities with beaches. To address this data limitation, I use the share of residents from tourist-source countries in each municipality to predict the number of overnight stays in hotels. This information is obtained from the Continuous Population Statistics of National Institute of Statistics (INE) from 1996 to 2019. Further details can be found in section 4.2.

Outcome variable. The primary outcome of interest is the per capita gross income in a municipality, obtained from the 2019 Household Income Distribution Map of the National Statistics Institute (INE). For years preceding 2004, there is a lack of available data on per capita income at the municipal level. To address this, I follow the approach of Parellada (1992) and estimate municipal per capita income through Ordinary Least Squares (OLS) regressions for the years 1965, 1990, and 1996. This estimation utilizes various economic indicators at the geographical level, including the number of trucks, the number of other firm-owned vehicles, the number of telephone lines, the number of commercial licenses excluding food, and the number of bank branches. The estimated per capita income serves as a control for the initial level of per capita income.

Regarding other key outcomes, various variables are sourced from the Public State Employment Service (SEPE), such as worker affiliation by economic activity and contract type (permanent or temporary contract) in 2019, and from the population census in 1990. Municipal-level years of schooling for 1990, 2000, and 2011 are derived from the population census. Additionally, data from the Continuous Register Statistics provides the number of residents by nationality at the municipal level from 1996 to 2019, allowing for the measrement of residents from tourist countries in a municipality. These variables are summarized in Panel B of Table A3.1.

Control variables. To account for potential municipal differences in socioeconomic development before tourism development, I control for the level of agricultural production in 1960 using data from the 1962 and 1990 agricultural censuses. Population data from the population censuses since the beginning of the 20th century and education data from the 1930 census are also included. Geographical variables, such as soil quality, altitude, ruggedness, surface, temperature, rainfall, and hours of sun, are incorporated as additional controls. These control variables are summarized in Panel C of Table A3.1. The average population in

1950 was 5,138 inhabitants, with over 47 percent of the adult population unable to read or write in 1930. On average, almost 32 percent of the municipality's land was used for agricultural production in 1962.

5 Empirical analysis

The growth of tourism is closely intertwined with various factors that contribute to overall economic development. Factors that enhance a municipality's appeal to tourists, such as picturesque landscapes, favorable climates, or historical landmarks, can also make the city more attractive for residents and businesses in general. Additionally, advancements in accessibility, achieved through the construction of new highways and airports, have the potential to stimulate growth not only in tourism but also in other industries.

Therefore, accurately gauging the impact of tourism on per capita income necessitates identifying a source of external variation in tourism attractiveness. This paper employs two distinct approaches for this purpose. The first approach focuses on the evolution of tourism since its initial surge in the 1960s, utilizing cross-sectional variations in tourism exposure linked to amenities like beaches and weather for identification. The second method examines a subsequent wave of tourism development in the 1990s, employing a shift-share analysis that combines the percentage of residents from countries that are major sources of tourists in each municipality with the growth rate of tourists from these countries throughout Spain.

5.1 Long-term analysis from 1965-2019: beach amenities

In this subsection, I present the first approach, which is aimed at capturing the long-term economic consequences of tourism on local economic outcomes across Spanish municipalities. To do so, I exploit cross-sectional variation in tourism attractiveness, related to the presence of sandy beaches. I begin by documenting the effects of growth in tourism per capita on municipality-level per capita income in the current cross-section of Spanish municipalities, and estimate the following regression:

$$y_{i,2019} = \alpha \Delta Tourismpc_{i,1965-2019} + X'_{i,0}\beta + \gamma_p + \epsilon_{it} \quad (1)$$

where y_{it} is the outcome of interest in per capita terms (e.g. log per capita gross income in 2019) in municipality i in 2019. The variable $Tourismpc_{i,1965-2019}$ measures the growth per capita in municipality i, and in year 1965-2019.[6] I also include a number of municipal-level control variables, $X_{i,0}$, measured prior to the start of the period, and that I described in the previous section, and province fixed effects γ_p. One noteworthy aspect of this approach is its ability to capture the long-term impacts of tourism on the local economy, starting from its inception.

The primary challenge in studying the causal impact of tourism on economic outcomes lies in the likelihood that tourist inflows are correlated with various factors that independently affect economic outcomes, apart from their impact on tourism. This correlation could result in a biased Ordinary Least Squares (OLS) estimation of the equation (1).

To address this issue and exploit plausibly exogenous variation in tourism attractiveness across Spanish municipalities, I adopt the argument put forth by Fabert and Gaubert (2019). They posit that tourism activity is largely determined by the quality of specific local natural amenities, with the presence of a sandy beach being a key factor. Given that the Spanish tourism boom in the 1960s predominantly affected municipalities with easily accessible natural resources like beaches, high temperatures, and sunny weather, I use the presence of a beach in a municipality as an instrument for per capita tourism growth.

To compare municipalities with and without tourism amenities at the outset of the tourism boom in the 1960s, I focus on those with beaches and inland municipalities. Since nearly the entire Spanish coast has a beach (except for 2%), I choose inland municipalities as the control group. I control for various socioe-

[6]Notice that the tourism variable is not measured in logs, in order to address the challenges arising from the presence of zeros in the variable in the year 1965. During this year, many of the municipalities exhibited zero tourism activity. This variable is also very skewed, so in order to interpret the estimated coefficient we will multiply the coefficient by the median value of the sample, meaning that the results will indicate the effect percent change in per capita income as of 2019 for a municipality that during the period 1965-2019 has experienced an increase in tourism specialization equal to the median.

conomic characteristics predating the onset of tourism, as detailed in the data section, to ensure comparability between coastal and inland municipalities.

In the first stage, I estimate the following first stage equation:

$$\Delta Tourismpc_{i,1965-2019} = \mu \mathbb{1}(Beach_i) + X'_{it}\eta + \gamma_p + \epsilon_{it} \quad (2)$$

where $\mathbb{1}(Beach_i)$ is a dummy variable that takes on a value of one if a municipality has a beach, and zero otherwise.

Finally, I am able to estimate the second stage equation to measure the causal relation of interest:

$$y_{i,2019} = \gamma \Delta Touris\widehat{mpc_{i,1}}_{965-2019} + X'_{it}\theta + \pi_p + \xi_{it} \quad (3)$$

where $\Delta Touris\widehat{mpc_{i,1}}_{965-2019}$ is the predicted value of the growth in tourism per capita obtained after from expression (2). Two fundamental assumptions underlie Specification (3): (a) the influence of a beach on municipality-level economic outcomes is confined to its impact on local tourism activity, and (b) the beach's effect on tourism activity is primarily limited to the municipality in which it is situated.

The identifying assumption in specification (3) is that the presence of a beach affects municipality-level economic outcomes relative to other municipalities only through its impact on local tourism activity. The main coefficient of interest, β, captures the marginal effects of an increase in per capita tourism growth on income per capita. To ensure a meaningful interpretation of this coefficient, it is essential to control for the determinants of long-run development that correlate with tourism.

The rationale supporting assumption (a) in our context stems from the comparison of coastal and inland municipalities situated not far away. This proximity ensures a shared set of characteristics between the two groups. To verify any remaining differences, Table A3.2 examines the correlates of tourism, presenting OLS estimates derived from regressing beach and per capita tourism growth against each variable separately. Standardized-beta coefficients and corresponding p-values are also reported. Results reveal that the presence of a beach and higher per capita tourism growth correlate with various geographic and demographic characteristics measured before the tourism surge. On average, beach municipalities exhibit smaller populations, lower illiteracy rates, and reduced agricultural production compared to inland counterparts. They also feature higher altitudes, average temperatures, more extensive surface area, and less rugged terrain. These covariates are incorporated into the main specifications at baseline to mitigate omitted variable concerns. Additionally, ”entropy balancing” is employed to reweight municipalities, enhancing covariate balance between the treatment and control groups.

To further ensure the validity of assumption (a), a measure of beach tourism attractiveness considers not only the presence of a beach but also its length, width, temperature, hours of sun, and precipitation. Table A3.3 displays the correlation between tourism and the variables used to construct beach attractiveness, revealing positive associations between higher beach length, width, more hours of sun, higher temperatures, and increased tourism levels.

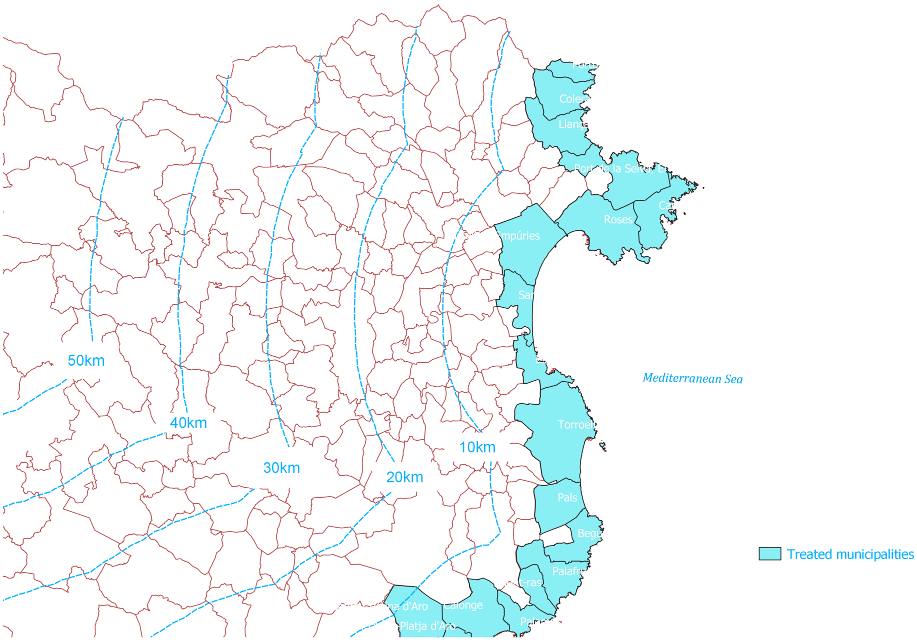
In addressing assumption (b), placebo analyses examine the impact of beaches on the prior decadal evolution of municipal population, the only crucial outcome variable with available historical data. The analysis excludes municipalities in large urban areas (with over 50,000 residents) to mitigate concerns related to higher tourism attractiveness and economic activity in proximity to major economic centers.

To confirm assumption (b), municipalities within 10km of the treated one are excluded from the control group. Robustness checks involve altering the distance cutoff for excluding nearby municipalities in Figure 3.3, where treated municipalities are depicted in blue and control municipalities in white. Various robustness checks explore modifying the control group by adjusting the distance cutoff for nearby municipality exclusions.

5.2 Second wave of tourism development from 1996-2019: shift-share analysis

The paper employs a second empirical approach to investigate the medium-term causal impact of tourism. This method involves analyzing a subsequent wave of

Figure 3.3.: Location of treated and control municipalities in coastal provinces



Notes: Treated municipalities (colored in blue) have beaches, while control municipalities (colored in white) do not. Distance cutoffs are applied for excluding nearby municipalities in the robustness section. This map serves as a sample representation of the distribution of treated and control municipalities along the coastal provinces.

tourism development in Spain during the late 1990s and early 2000s. This period witnessed notable changes in the tourism industry, including enhanced air accessibility and the introduction of new accommodation options, significantly influencing the influx of tourists to Spain. Given that the primary draw for tourism in Spain is sun-and-beach tourism, the analysis specifically centers on a sample of 437 municipalities with beaches.

To assess the effects of an exogenous rise in tourist numbers, an effective approach involves estimating the impact of tourism activity at the municipality level. This can be achieved by utilizing the per capita number of overnight stays in tourist accommodations, a commonly employed measure of tourism activity. The estimation of the baseline specification is as follows:

$$y_{i,2019} = \alpha + \beta \Delta OvernightStays_{i,1997-2019} + X'_{i,0}\beta + \gamma_p + \epsilon_{it} \quad (4)$$

where $y_{i,2019}$ is the outcome of interest in per capita terms (e.g. log per capita gross income) in municipality i in t. The variable $\Delta OvernightStays_{i,1997-2019}$

measures the change in the per capita number of overnight stays before and after the second wave of tourism development in municipality i. The vector $X'_{i,0}$, includes a number of municipal-level controls that I described in the previous section.

This strategy comes with certain limitations, namely the availability of overnight stay data for a restricted number of beach municipalities, totaling only 96 out of the 437 considered. Moreover, it's crucial to acknowledge that tourists don't select destinations randomly; rather, they are drawn to areas that are with specific characteristics. Consequently, a simplistic comparison between high and low overnight stays in beach municipalities may yield a biased estimate of the tourism impact.

To overcome the limitations associated with using per capita overnight stays as a proxy for tourism activity, a shift-share analysis is employed to examine the effects of an exogenous increase in tourist numbers. This method combines information about the distribution of overnight stays by source country at the onset of the period with information about the national growth rate of overnight stays by source country. Because we do not have detailed information of overnight stays by source country at the municipality level, we rely on information regarding the number of residents of such nationalities in each municipality in the base year.

The shift-share analysis leverages early settlement patterns of residents from tourist countries, using this information to forecast the current distribution of tourists. Essentially, the shift-share analysis operates on the premise that tourists might transition into becoming residents in a municipality after visiting, potentially extending their stay. Furthermore, tourists are more inclined to visit areas in Spain where people from their home country reside.This analytical approach is closely aligned with a common instrument in immigration literature, which relies on historical settlement patterns of immigrants by country of origin to predict the current geographic distribution of the immigrant population (Cortes, 2008; Sá, 2015).. The rationale is akin to immigration dynamics, where networks play a pivotal role in influencing the location choices of new immigrants, aiding in the job search process and assimilation into a new culture (Card, 2003; Jaeger et al., 2018, among others). Similarly, tourists may depend on information and recommendations from fellow nationals when deciding on travel destinations or on property purchases.

In Table A3.4 in the appendix, it is evident that eleven nationalities consistently account for over 70% of tourist inflows to Spain across all observed years. Given this observation, my initial analysis focuses on examining the correlation between the number of residents by nationality at the municipality level and the corresponding number of overnight stays by nationality. This investigation is conducted for the 96 municipalities for which overnight stay data is available, and Figure A3.1 in the appendix visually presents the correlation. Notably, the figure illustrates a robust and statistically significant correlation between the number of overnight stays by nationality and the presence of residents from tourist source countries in a municipality.

Building on this correlation, I utilize the share of residents of nationality $j$from a tourist country in each beach municipality at time t_0 (that is in 1997) and the rate of growth of overnight stays by country at the national level to forecast the increase in the number of overnight stays from time t_0 to time t (that is during the period 1997-2019). To achieve this, I construct the shift-share instruments in the following manner. First, the forecasted increase in the number of overnight stays per capita in municipality i can be expressed as a summation of the forecasted increase for each source country j:

$$\widehat{\Delta O}_{i,t-t_0} = \sum_j \widehat{\Delta O}_{i,j,t-t_0} \quad (5a)$$

Second, the increase for each source country j in municipality i can be expressed as the product of the (estimated) share of overnight stays from this country going to municipality i in t0 and the growth of overnight stays from this country at the national level:

$$\Delta\widehat{O}_{i,j,t-t_0} = \left(\frac{\hat{O}_{i,j,t_0}}{\hat{O}_{i,j,t-t_0}}\right) \times \widehat{\Delta O}_{j,t-t_0} \quad (5b)$$

Third, because we do not have information on the distribution of overnight stays by country and municipality, we proxy the municipal share of overnight stays for each source country with the municipal share of residents from this country. We have discussed the plausibility of this assumption above.That is, we assume:

$$\frac{\hat{O}_{i,j,t_0}}{\hat{O}_{j,t_0}} \approx \frac{T_{i,j,t_0}}{T_{j,t_0}} \quad (5c)$$

Now, after plugging (5b) and (5c) into (5a), and dividing both sides of the equation by the population of the municipality in t_0, we get:

$$\Delta \widehat{Overnight}\ stays\ pc_{i,t-t_0} =$$
$$\sum_j Tourist\ residents\, pc_{i,j,t_0} \times \left(\frac{\Delta Overnight\ stays_{j,t-t_0}}{Overnight\ stays_{j,t_0}} \right) \times \left(\frac{Over.\ stays_{j,t_0}}{Tourist\ res._{j,t_0}} \right) \quad (5d)$$

This expression says that the increase in the number of overnight stays per capita can be predicted by a summation over all tourist source countries of the product between three terms: the number of tourist residents per capita from this country in the municipality, the national growth rate of overnight stays for this country, and the national ratio between overnight stays and number of tourist residents for this country.This computation is feasible with the available information. We will use information for nine key nationalities—Germans, Britons, French, Belgians, Dutch, Italians, Portuguese, Japanese, and Americans. These nationalities hold significant importance in terms of magnitude, and data for them is available throughout the entire study period.
The estimation now advances by estimating the following reduced-form equation:

$$y_{i,2019} = \alpha \Delta \widehat{Overnight}\ stays\ pc_{i,1997-2019} + X'_{i,0}\beta + \gamma_p + \varepsilon_{it} \quad (6)$$

Notice that one advantage of the above shift-share specification is that it can be estimated for all 437 beach municipalities, and not just for the ones with information regarding overnight stays. Using the 437 allows a fairer comparison of the result of this analysis with those of the first analysis performed in the paper and increases the external validity of the exercise. It is true, however, that the first-stage equation and, therefore also the 2SLS equation, can only be estimated with the reduced sample of 96 municipalities for which we do have that information. However, as we will show later, the coefficient of the first stage (estimated with these 96 municipalities) is very close to one, telling us that the coefficient of the reduced form and of the 2SLS should be very similar. Nevertheless, despite we are focusing for the main analysis in the larger sample, we will also report the results obtained in the smaller one, which are, by the way, very similar. This will also allow us to compare the 2SLS results with the OLS ones, that can only be obtained with the smaller sample.

I do some additional checks to validate the shift-share analysis. As argued by Goldsmith-Pinkham et al. (2018), in the shift-share framework, identification primarily stems from the 'shares.' The 'share' component imparts predictive power to the instrument by leveraging the tendency of new tourists from a specific nationality to choose municipalities where more residents from their country are settled. If the initial shares of residents from tourist countries across municipalities are uncorrelated with current changes in the outcomes of interest, this identification strategy effectively isolates the causal effect of actual tourism inflows on the variables in question.

By concentrating on the period immediately following the exogenous changes in regulation, we can more confidently attribute any alterations in tourism inflows to the exogenous shock rather than pre-existing developments in the municipalities. To ensure the validity and robustness of the shift-share analysis, I conduct several placebo tests in the subsequent section. These tests scrutinize the correlation between the shift-share and local income and population growth before the second wave of tourism development. Additionally, following the method of Goldsmith-Pinkham et al. (2020), I calculate Rotemberg weights for each nationality to further assess the validity of the identifying variation. These weights reveal which nationalities entering the instruments are driving the results. This approach helps evaluate whether the shift-share accurately captures the causal effect of tourism inflows on the variables of interest.

As argued in Goldsmith-Pinkham et al. (2018), in the shift-share setting identification mostly comes from the 'shares'. The "share" component provides predictive power to the instrument as it exploits the fact that new tourists of a given nationality tend to go to the municipalities where more residents from their country are settled. If the initial shares of residents from tourist countries across municipalities is uncorrelated with current changes in outcomes of interest then this identification strategy identifies the causal effect of actual tourism inflows on the variables of interest. By focusing on the period immediately following the exogenous changes in regulation, we can more confidently attribute any changes in tourism inflows to the exogenous shock rather than to pre-existing developments in the municipalities. In order to ensure the validity and robustness of the shift-share analysis, I run several placebo tests in the following section. These tests examine the correlation between the shift-share and local income and population growth prior to the second wave of tourism development. In addition, I follow the method of Goldsmith-Pinkham et al. (2020) and compute Rotemberg weights for each nationality to further assess the validity of the identifying variation. These weights indicate which nationalities entering the instruments are deriving the results. By doing so, I assess whether the shift-share accurately captures the causal effect of tourism inflows on the variables of interest.

6 Results

The results of the empirical analysis are as follows. First, I establish a descriptive association between the growth of per capita tourism and beach availability. Leveraging the first wave of tourism development, I demonstrate the impact of tourism per capita growth on municipalities' income, supported by robustness tests. Second, by exploiting the second wave of tourism development, I showcase the impact of overnight stays growth on municipalities' income, along with corresponding robustness tests. Both identification strategies yield similar results, indicating a significant impact of tourism specialization on the long-term economic outcomes of municipalities in Spain.

6.1 Long-term analysis from 1965-2019: beach amenities

Main results. The initial focus is on the early stages of tourism development in the 1960s, particularly examining the role of beach amenities in Spanish municipalities. The core findings are summarized in Table 3.1.

In Panel B, Columns 5 and 6 of Table 3.1, the first-stage regression results indicate a robust correlation between the presence of a beach and per capita tourism growth. Specifically, municipalities with beaches show, on average, 1.6 times higher per capita tourism growth than inland counterparts within coastal provinces. The F-statistic tests validate the strength of the beach presence as an instrumental variable in this context.

To account for potential pre-tourism developmental differences, several socioeconomic and geographical factors are controlled for, including population size in 1950, illiteracy rate in 1930, income in 1965, agricultural production in 1960, initial levels of tourism per capita, along with variables like soil quality, altitude, ruggedness, surface area, temperature, rainfall, and sunshine hours. Province-level fixed effects and clustering are also employed where indicated.

Panel A of Table 3.1 presents the impact of per capita tourism growth on local income levels. Columns 1 and 2 show ordinary least squares (OLS) estimates for 2019 income levels, while columns 3 and 4 report the reduced-form impact of beach presence in 1965 on 2019 income levels. Columns 5 and 6 offer instrumental variable (IV) estimates, where per capita tourism growth is instrumented using beach presence.

The results reveal that beach presence correlates with lower income levels in 2019, a trend echoed in both the reduced-form and IV estimates. The IV estimates, particularly in columns 5 and 6, are more pronounced than the OLS results, suggesting the effectiveness of the instrumental variable approach in addressing endogeneity issues. Specifically, the results in column 6 reveal that municipalities experiencing the median increase in tourism per capita during the period 1965-2019 have 22,2% lower per capita income in 2019.[7] Hence, it can be conclude that tourism specialization exerts a significant, and negative, effect on municipalities' per capita income.

[7]The median increase in tourism per capita during the 1965-2019 period is 2.62.

Table 3.1.: Impact of tourism growth on income per capita: long-term analysis (1960-2019)

	Panel A. Dep. variable: Income per capita 2019					
	OLS	OLS	RF	RF	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)
Per capita tourism	-0.004*	-0.004***			-0.051***	-0.085***
growth (1965-2019)	(0.010)	(0.010)			(0.008)	(0.018)
$\mathbb{1}$(Beach)			-0.071***	-0.137***		
			(0.015)	(0.025)		
Mean dep. var.	9.49	9.49	9.49	9.49	9.49	9.49
	Panel B. First stage: Dep. variable: per capita tourism growth					
$\mathbb{1}$(Beach)					2.093***	1.598***
Kleibergen-Paap rk					38.64	35.890
LM F-stat.					[16.38]	[16.38]
Observations	1,196	1,196	1,196	1,196	1,196	1,196
All Controls	Y	Y	Y	Y	Y	Y
Province FE	N	Y	N	Y	N	Y

Notes: (1) Panel A reports the estimated effect of per capita tourism growth on income level using three different regression methods: OLS, RF, and IV. The dependent variable in all cases is the log of income in 2019. Panel B reports the first-stage regression results, where the independent variable is $\mathbb{1}$(Beach), a dummy variable equal to one if the municipality has a beach and zero otherwise. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

In furthering the analysis, I introduce the variable *Beach attractiveness*, which quantifies the quality and allure of a beach. This variable takes into account several factors such as the length and width of the beach, derived from 1957 aerial photos, as well as climatic elements like temperature, sunshine hours, and precipitation. The interaction of *Beach attractiveness* with the binary variable *Beach* is then incorporated into Equation (2).

Table A3.5 presents the results of this extended analysis, which incrementally integrates various beach features across five columns. The first column accounts for the standardized beach length in kilometers, followed by the addition of sunshine hours in the second column. The third column includes the beach width in kilometers, while the fourth and fifth columns add temperature and precipitation, respectively.

The instrumental variable (IV) results from this analysis suggest a nuanced conclusion: not only does the presence of a beach but also its favorable geographical and climatic characteristics, contribute to a negative impact on the income levels of municipalities. The first-stage F statistic, when incorporating these additional beach features, is observed to be slightly lower compared to the analysis focusing solely on the presence of a beach. This indicates that while beach presence remains a primary determinant of tourism attractiveness, other factors such as beach length and hours of sunshine, as highlighted in column 2, also significantly influence tourism attractiveness and, consequently, income levels.

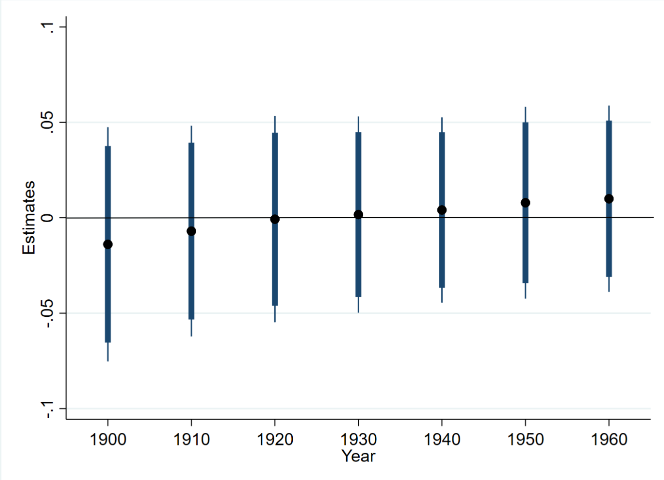
Robustness. While Table 3.1 indicates a strong negative effect of tourism on local income levels, a potential concern arises regarding the direct influence of beach and related geographical and climatological features (such as extended beach lengths, high temperatures, more sun hours) on the local economy. These features could potentially affect the residential choices of Spanish residents, not just through their impact on tourism development, but also as direct amenities influencing employment and population dynamics relative to inland municipalities.

To address this concern, Figure 3.4 presents a placebo falsification test using the same sample of municipalities, but during a period preceding the emergence of beach tourism as a significant economic factor in Spain. This analysis utilizes a long time series of population census data spanning from 1900 to 1960. However, due to data limitations at the municipal level before 1960, the historical census data is restricted to municipality population figures.

The results displayed in Figure 3.4, which report the instrumental variable (IV) estimates, show insignificant point estimates regarding the effect on municipality populations before 1960. This finding suggests that the presence of a beach, used as an instrument for per capita tourism growth, is unlikely to be capturing locational fundamentals that directly influence residential choices along the coastline in a significant manner. Therefore, the negative impact of tourism on income levels observed in the study is less likely to be confounded by direct amenity effects unrelated to tourism.

Furthermore, the analysis presented in Table 3.1 is conducted with a carefully selected sample. To mitigate the influence of commuting patterns and ensure comparability in initial socio-economic and geographical characteristics, the con-

Figure 3.4.: Placebo falsification test: impact of tourism growth on municipality populations prior to the tourism boom (1900-1960)



Notes: (1) The graph shows the IV estimation of the impact of per capita tourism growth instrumented by the presence of a beach on population. The dependent variable is the population expressed in logs. (2) The standard errors used in the estimation are robust and clustered at the province level.

trol group (interior municipalities) excludes those located within less than 10 km or more than 50 km from beach municipalities.

In assessing the robustness of this distance criterion, Figure A3.2 in the appendix presents a sensitivity analysis. This analysis explores the impact of tourism growth on local income by adjusting the distance cutoffs for the selection of control municipalities. The treated municipalities in this analysis are consistently those with a beach, while the control municipalities are classified into six different distance ranges: (1) 20-50 km, (2) 20-40 km, (3) 20-30 km, (4) 30-50 km, (5) 30-40 km, and (6) 40-50 km.

This sensitivity analysis demonstrates consistent results. Across all specifications, regardless of the distance cutoffs applied to the control municipalities, the impact of tourism on local income remains consistent. Specifically, the analysis indicates that per capita tourism growth consistently has a negative impact on income levels, with the effect's magnitude being similar across all six distance ranges. This result suggests that the observed impact of tourism on income is robust and not significantly influenced by the selection of control municipalities based on varying distance criteria.

In Figure A3.3 in the appendix, another robustness check is performed, examining the impact of tourism growth on 2019 income levels by varying the definitions of the treated groups. This analysis reveals that when municipalities within 10 km of beach municipalities are considered the treated group, and those more than 20 km away as controls, a modest negative impact of per capita tourism growth on income is observed. However, in other configurations, where larger distances define the treated group, the effects are found to be insignificant.

To further understand these dynamics, Table A3.7 investigates the economic structures of municipalities situated around 10 km from beach municipalities compared to those more than 20 km away. The lack of significant differences in the economic structures of these groups, as indicated by the results in Table A3.7, suggests a uniformity in economic composition across these distances.

A plausible explanation for the observed negative effect in the 10 km range is the presence of commuting patterns. Workers residing in municipalities close to beach areas likely commute to work in beach municipalities, thus experiencing similar economic impacts as residents living directly in the beach municipalities. Consequently, the negative influence of tourism growth on income levels in municipalities within a 10 km radius of beach municipalities could predominantly affect these commuting workers. This observation reinforces the rationale behind excluding municipalities within 10 km of beach municipalities from the control group in the initial analysis.

In addition to the above analyses, I also conducted a sub-sample analysis categorizing the main sample into five groups based on surface area. This segmentation aimed to investigate how the dynamics between tourism specialization and income levels differ across municipalities of varying sizes. The findings, presented in Figure A3.4, offer nuanced insights into this relationship.

The analysis reveals that the negative impact of per capita tourism growth on income levels is both significant and negative for municipalities classified as medium, large, a combined category of medium and large, and across all municipalities collectively. However, an interesting deviation is observed in small municipalities (with a surface area up to 20 km^2), where the negative impact of per capita tourism growth, although present, does not reach statistical significance.

This pattern suggests that larger and medium-sized beach municipalities, likely with more substantial tourism activities and a more developed tourism industry, experience a more pronounced and statistically significant impact on income. In contrast, smaller beach municipalities, which may have lower levels of tourism activity and limited capacity to accommodate large numbers of tourists, seem to experience a less pronounced negative impact on local income levels.

Finally, the study examines whether the impact of tourism on income levels was more pronounced in the initial period (1965-1996) or in the later period (1996-2019). A closer analysis of the data shows that the median growth in per capita tourism from 1965 to 1996 was 1.5. This growth correlates with a 5.7% decrease in income levels by the end of 1996. In contrast, the median growth in per capita tourism for the later period from 1996 to 2019 was notably higher, at 4.16. This increased level of tourism growth is associated with a more substantial 16.6% reduction in income levels by 2019. These results highlight a more pronounced negative impact of tourism on income levels in beach municipalities during the later period (1996-2019) compared to the earlier period (1965-1996). This trend suggests that as tourism activity intensified in beach municipalities over time, its detrimental effects on local income levels became increasingly severe.

6.2 Second wave of tourism development from 1996-2019: shift-share analysis

Main results. I now present the results focusing on the second period of tourism development (1996-2019). Ideally, the analysis would begin with first-stage regressions showing the relationship between predicted and actual overnight stays. However, due to data constraints, such information is available for only a subset of 96 out of 437 beach municipalities.

Before delving into the reduced form results for all 437 beach municipalities, I examine the association between predicted and actual overnight stays for this subsample of 96 municipalities. As illustrated in Figure A3.5, a positive and significant correlation is observed between these two variables. Moreover, Table A3.6 presents the first-stage regression results, demonstrates high correlation between the predicted growth in overnight stays, as outlined in Equation (5), and the observed change. The coefficients are consistently close to 1 across all specifications, with standard F-statistic tests confirming the strength of the instrument in the context of these specifications.

Table 3.2.: Impact of overnight stays growth on income per capita: medium-term analysis (1996-2019)

	Income level				Population level	
	Reduced form		Placebos			
	2019	2019	1990	1990	1990	1990
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Predicted overnight	-0.057***	-0.071***	-0.002	-0.001	-0.001	-0.000
stays (1996-2019)	(0.016)	(-0.071)	(0.000)	(0.000)	(0.000)	(0.000)
Mean dep. var.	9.49	9.49	9.49	9.49	9.49	9.49
Observations	437	437	437	437	437	437
All Controls	Y	Y	Y	Y	Y	Y
Province FE	N	Y	N	Y	N	Y

Notes: (1) The table shows the reduced form estimates of the impact of tourism growth measured by the predicted number of overnight stays and instrumented by the shift-share explained in section 4 on income and population levels. The unit of observation is the municipality. Columns (1) and (2) show the impact of an increase in the number of overnight stays during the period 1997-2019 on income level in 2019. Columns (3) and (4) show the impact of an increase in the number of overnight stays during the period 1997-2019 on income level in 1990. Columns (5) and (6) show the impact of an increase in the number of overnight stays during the period 1997-2019 on population level in 1990. (2) Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

With the relationship between predicted and actual overnight stays established for the subsample of Spanish beach municipalities, I then explore the medium-term impact of per capita tourism on local income growth. I estimate specification (6) with log income per capita in 2019 on the left-hand side, and present the Reduced Form results in Table 3.2.

The Reduced Form estimation indicates a negative association between the increase in overnight stays following the second period of tourism development and per capita income. Specifically, column (2) in Table 3.2 reveals that municipalities asof 2019, a municipality experiencing a median increase in tourism per capita over the period has a per capita income a 21,5% lower. [8]

Consequently, the shift-share analysis corroborates that tourism specialization has a significant and negative effect on municipalities' per capita income. Table

[8]The median per capita tourism growth during the period 1997-2019 is 3.03.

A3.6 in the appendix further supports this conclusion, presenting the OLS, reduced form, and IV regression results for the impact of tourism measured by the actual number of overnight stays, using the subsample of 96 municipalities. These coefficients align with the findings in Table 3.2, consistently indicating a negative effect of tourism specialization on income per capita.

Robustness. Table 3.2 illustrates a strong negative effect of the increase in overnight hotel stays on local income levels in municipalities with beaches. A key concern in this analysis is the validity of the shift-share instrument. This instrument's identification relies on initial shares of residents by nationality, which are presumed to reflect differential, exogenous exposure to the second wave of tourism development.

However, since these predetermined shares are equilibrium outcomes influenced by tourism attractiveness, there's a possibility they could correlate with income levels during that period. The literature on shift-share analysis, particularly Goldsmith-Pinkham et al., (2020), posits that the validity of this approach hinges on the assumption that initial shares are exogenous to changes in income, rather than to the initial income levels themselves.

To test this crucial assumption, I follow the methodology proposed by Goldsmith-Pinkham et al. (2020), beginning with the computation of Rotemberg weights for different nationalities, based on the framework established by Rotemberg (1983) and Andrews et al. (2017). These weights help identify which nationalities predominantly influence the shift-share results. In this analysis, the five most significant nationalities are Germans, Britons, French, Belgians, and Portuguese.

Following Goldsmith-Pinkham et al.'s (2020) recommendation, I examine the correlation between the initial nationality shares and potential confounders. The confounders considered include population growth (1997–2019), education level in 1990, unemployment level in 1990, and agricultural and manufacturing production in 1990. The results of this correlation analysis are reported in Table A3.9 in the appendix. Reassuringly, this robustness check indicates that the initial nationality shares are not significantly related to these potential confounding factors.

An essential aspect of verifying the validity of the shift-share analysis is to investigate its correlation with local income growth prior to the onset of the second wave of tourism development. This examination is crucial to ensure that the shift-share instrument is not influenced by pre-existing economic conditions.

In Table 3.2, the correlation between local income levels in 1990 (for municipalities with beaches) and the predicted growth in overnight stays from 1997 to 2019 (calculated using the shift-share method) is presented. The results suggest that there is no significant correlation between the shift-share instrument and the pre-treatment local income levels. This finding is critical as it implies that the shift-share analysis is not capturing pre-existing income trends that could confound the results. Furthermore, the study extends this examination to include population growth. The correlations between the shift-share instrument and population growth, as indicated in columns (3) and (4), are also found to be statistically insignificant. This lack of significant correlation adds an additional layer of validation to the shift-share analysis. It supports the conclusion that the shift-share instrument is not confounded by pre-treatment population growth trends.

6.3 Mechanisms

To understand the mechanisms driving the negative impact of tourism on income levels, I gathered detailed municipal-level data encompassing aspects like worker affiliation, contract type, and education level. The data reveals that an increase in per capita tourism growth correlates with an increase in temporary contracts and a decline in educational attainment. It also indicates a shift in the workforce from industrial and agricultural sectors to those associated with tourism.

Industrial Mix. The first mechanism explored is the economic structure of the municipality. Table 3.3 provides insights into tourism's impact on employment across various sectors, including manufacturing, construction, real estate, hotels, food-service, and agriculture. Unfortunately, sector-specific employment data at the municipal level is available only from 1990 onwards. In Table 3.3, I present findings using the first empirical strategy, examining the impact of per capita tourism growth on the level of outcomes in 2019. Per capita tourism growth is instrumented with $\mathbb{1}$(Beach), a dummy variable indicating the presence of a beach in the municipality.

Table 3.3.: Effects of tourism specialization on employment by sector: 1965-2019

	Employment by industry			
	Agriculture	Manufacturing	Construction & real estate	Hotels & foodservice
	IV	IV	IV	IV
	(1)	(2)	(3)	(4)
Per capita tourism	-0.179*	-0.621***	0.787**	0.464***
growth (1965-2019)	(0.221)	(0.192)	(0.745)	(0.155)
Mean dep. var	14.384	18.336	9.077	15.968
Kleibergen-Paap	19.343	19.343	19.343	19.343
rk LM F-stat.	[16.38]	[16.38]	[16.38]	[16.38]
Observations	1,196	1,196	1,196	1,196
All Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y

Notes: (1) The table shows the estimates of the effect of per capita tourism growth on employment shares in different sectors using the IV method. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

The instrumental variable (IV) estimates suggest that an increase in per capita tourism growth is associated with a rise in employment in construction, real estate, hotels, and food services, and a decline in manufacturing and agricultural employment. This pattern highlights the tourism sector's role in reallocating resources toward service activities and away from traditionally traded sectors like industry and agriculture.

More specifically, the findings indicate that municipalities with higher per capita tourism growth in 2019 experienced a 17.9% decrease in agricultural employment and a 62% decrease in manufacturing employment. Conversely, there was a 78% increase in construction and real estate employment and a 46% increase in hotel and food-service related employment.

The increase in tourism activity has led to a resource shift from industry to services, as noted by Copeland (1991). According to the National Spanish Institute, in 2019, manufacturing workers earned 34 percent more gross annual income than workers in the tourism sector. This finding aligns with several studies in developed countries that have consistently found tourism workers to be among the lowest paid in any industry (Riley, Ladkin, & Szivas, 2002; Muñoz-Bullón, 2009; Santos & Varejao, 2007; Dogru et al., 2019).

The results obtained from the first empirical strategy are further supported by the reduced form results of the second empirical strategy, utilizing the shift-share analysis. In this approach, per capita tourism growth is measured using predicted overnight stays and is instrumented through the shift-share methodology outlined in section 4. With employment data by sector available at the municipal level from 1990, we are able to assess the growth in employment by sector between 1990 and 2019.

Table 3.4 presents these findings for the 437 municipalities with beaches. The results indicate that doubling the number of overnight stays during this period led to significant shifts in sectoral employment: there was a 27% decrease in agricultural employment and a 25% decrease in manufacturing employment. Concurrently, there was a notable increase in employment in tourism-related sectors, with a 26% rise in construction and real estate services, and an 11% increase in hotels and food-services employment.

Table 3.4.: Sectoral employment impacts of overnight stays growth: 1990-2019

	Employment change by industry			
	ΔAgriculture	ΔManufacturing	ΔConstruction & realestate	ΔHotels & foodservice
	RF	RF	RF	RF
	(1)	(2)	(3)	(4)
Predicted overnight stays growth (1996-2019)	-0.272**	-0.253*	0.262**	0.112**
	(0.106)	(0.09)	(0.102)	(0.052)
Observations	437	437	437	437
All Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y

Notes: (1) The table shows the RF estimates of the effect of per capita tourism growth on employment shares growth in different sectors. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

Labor Market. The second mechanism investigated to understand the observed negative impact on overall income levels is the nature of employment contracts in the tourism sector. The hypothesis posits that when a municipality specializes in tourism, there might be a shift toward more temporary contracts and fewer stable jobs, reflecting the seasonal nature of tourism employment.

To examine this hypothesis, Table 3.5 presents the results of the impact of tourism on the share of temporary contracts in 2019, utilizing both empirical strategies. Column (1) shows the results from the first empirical strategy, where per capita tourism is the independent variable, instrumented by the presence of a beach in a municipality. Meanwhile, column (2) aligns with the second empirical strategy, with the growth in overnight stays as the independent variable.

The findings indicate that municipalities that experienced a median increase in tourism per capita over the analysis period exhibited a significant rise in the proportion of temporary contracts. When applying the first empirical approach, which is based on accessibility to beach amenities, there was a 46% increase in temporary contracts. Conversely, using the second approach, grounded in shift-share analysis, the increase was 17%. This trend aligns with the observations of González & Surovtseva (2020), who noted that a shift toward tourism-related employment often entails a transition from permanent to more temporary contracts, leading to reduced employment stability. This shift in the nature of employment contracts can be attributed to the inherent seasonality of the tourism industry, where peak seasons necessitate a surge in temporary staffing, followed by periods of reduced employment demand during off-peak times.

Table 3.5.: Tourism's impact on employment contract types

	Share of temporary contracts 2019	
	Beach amenities analysis	Shift-share analysis
	IV	RF
Per capita tourism growth (1965-2019)	0.177**	
	(0.075)	
Predicted overnight stays growth (1996-2019)		0.058*
		(0.015)
Mean Dep. Var	0.943	0.943
Observations	1,196	437
All Controls	Y	Y
Province FE	Y	Y

Notes: (1) The table shows estimates of tourism on the share of temporary contracts. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

Education Level. Another mechanism potentially contributing to lower income levels in tourism-specialized municipalities is the lower educational attainment among the workforce. This trend could result from the opportunity cost associated with higher education and the decreasing perceived returns from such education. Table 3.6 presents estimates of tourism's impact on education across different specifications.

Columns (1) to (3) utilize per capita tourism growth, instrumented by the presence of a beach in a municipality, as the independent variable. In contrast, column (4) employs growth in overnight stays as the variable of interest. The dependent variable in column (1) is the level of tertiary education in 2011, while in column (2), it is for 2001. Column (3) examines the secondary education level in 1990. Lastly, column (4) assesses the growth in tertiary education between 1991 and 2011.

The analysis reveals that municipalities with more intensive tourism specialization tend to have lower education levels in the years 2011, 2001, and 1990, as shown in columns (1) to (3). Specifically, a higher increase in per capita tourism growth correlates with lower tertiary education levels among the 26-35 age population in 2011 and 2001. A similar trend is observed for secondary education in 1990.[9]

Utilizing the second empirical strategy, column (4) examines the impact of tourism growth on tertiary education growth. It is observed that in municipalities with beaches, a doubling of the number of overnight stays from 1997 to 2019 is associated with a 1% lower growth rate in tertiary education. This finding aligns with Oliver & Villalonga (2019), who discovered that Spanish regions specializing in sectors requiring a high level of unskilled labor tend to discourage students from continuing their education, leading to higher dropout rates and fewer students completing non-compulsory secondary education stages. In contrast, regions

[9] Note that in 2011 and 2001, the focus is on tertiary education, as secondary education became mandatory in Spain after 1990.

focusing on sectors demanding medium or highly skilled workers encourage young students to remain in the education system, as employment opportunities in these areas often require a minimum level of education.

Table 3.6.: Tourism's impact on educational attainment across years

	Beach amenities analysis			Shift-share analysis
	College education		High school education	Δ Tertiary education
	2011	2001	1990	1991-2011
	IV	IV	IV	RF
	(1)	(2)	(3)	(4)
Per capita tourism growth (1965-2019)	-0.018***	-0.013***	-0.013***	
	(0.006)	(0.004)	(0.015)	
Predicted overnight stays growth (1996-2019)				-0.001**
				(0.004)
Mean Dep. Var	0.150	0.196	0.455	0.05
Kleinbergen-Paap rk LM F-stat.	17.82	14.41	11.92	
Observations	1,196	1,196	1,196	437
All Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y

Notes: (1) The table presents estimates of the impact of tourism on education. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

7 Conclusions

Sun and beach tourism plays a crucial role in the economy of many countries. However, this economic sector is expected to suffer significant damage due to climate change, such as the projected loss of beaches, thermal comfort, water restrictions, and extreme weather events (Becken, 2020). Nevertheless, governments continue to invest in and promote tourism as a key sector in the national economy. The economic implications of tourism specialization are mixed and the economic evidence of the long-term impact continues to be scarce. With this paper, I aim to fill this current gap in the literature by analyzing the lasting impact of tourism specialization on per capita income.

In this study, I focus on Spain, one of the most popular tourist destinations in the world, where the tourism sector accounts for a substantial share of total employment, especially in coastal regions. To address the endogeneity underlying tourism specialization and economic development, I employ two distinct empirical strategies — one based on geographical and natural amenities and the other leveraging a shift-share analysis.

The first leverages geological variation along the Spanish coastline to construct instrumental variables for tourism specialization, including the existence and attributes of beaches and other weather features. This approach confirms that accessible natural resources, particularly beaches, are instrumental in determining the causal impact of tourism on income levels. The second methodology, a shift-share analysis, utilizes the distribution of residents from tourist-source countries in beach municipalities, capturing the effects of the second wave of tourism development.

Employing these identification strategies, the results demonstrate that municipalities experiencing pronounced tourism specialization exhibit a substantial decline in per capita income. Specifically, a municipality undergoing an increase in tourism per capita, commensurate with the median level observed across the sample, witnessed a 22% reduction in per capita income by the year 2019. The study also reveals key mechanisms driving this impact: a shift towards temporary employment contracts, a reallocation of labor from industry and agriculture to tourism-related sectors, and lower educational attainment.

This study provides robust empirical evidence of the localized, long-term economic consequences of tourism activity. As current tourism policies often prioritize boosting local tourism appeal, these findings highlight the need for a nuanced understanding of tourism's long-term implications compared to other economic sectors. Future assessments of tourism's role in Spain's overall economic activity and employment should consider the indirect countrywide effects, including the chain reactions in the broader economic system triggered by the tourism industry's demand for production inputs and labor.

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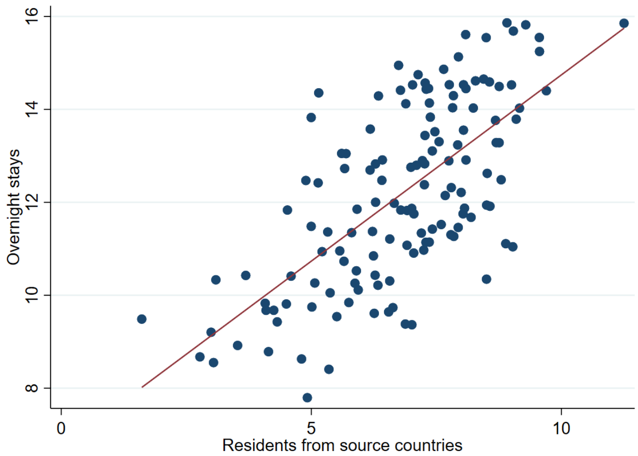
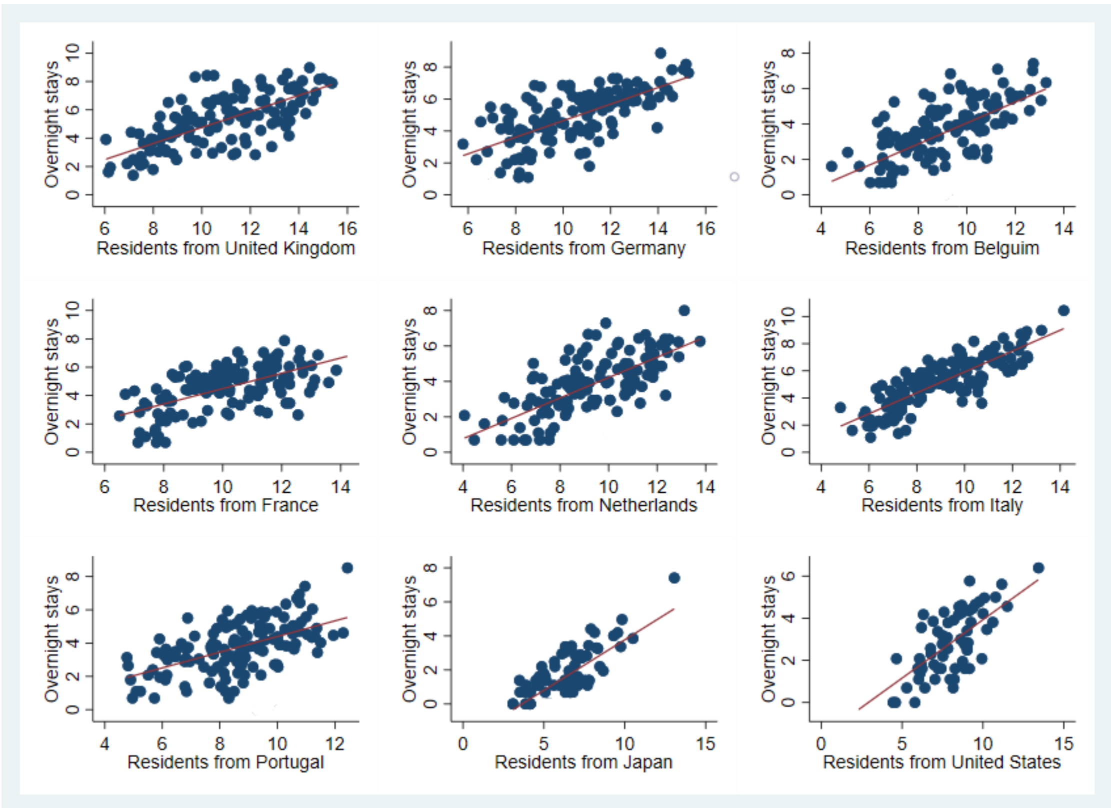
9 Appendix

Figure A3.1.: Correlation between overnight stays and resident nationalities in spanish municipalities

Panel A:

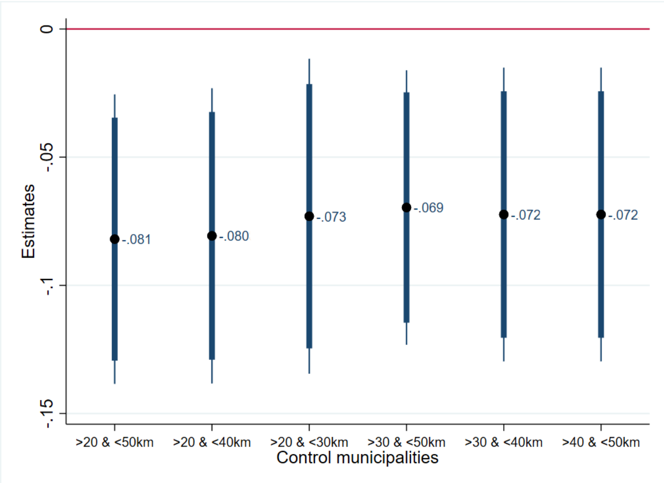


Panel B:



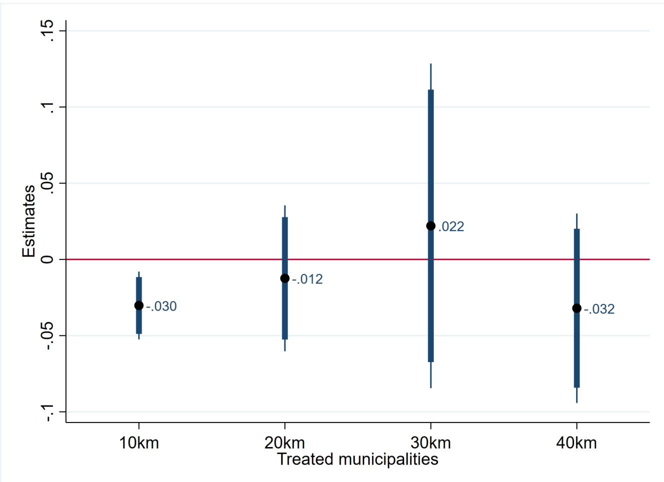
Notes: (1) This Figure shows the correlation between the per capita number of residents in a municipality and the per capita number of overnight stays in a municipal by nationality for the main tourist nationalities.

Figure A3.2.: Impact of tourism growth on income: varying distance cutoffs for control municipalities



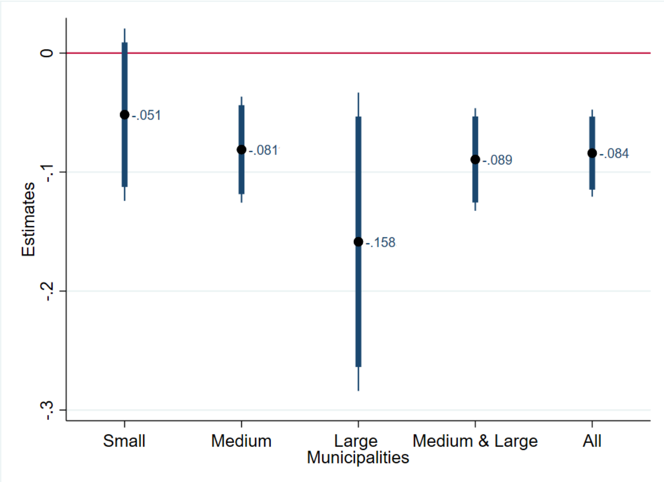
Notes: The graph presents the IV estimates of the impact of tourism growth on income level in 2019 using IV regression, where per capita tourism is instrumented by a dummy variable $\mathbb{1}$(Beach), which equals one if the municipality has a beach and zero otherwise. The unit of observation is the municipality. The graph shows the point estimates and 95% confidence intervals of the impact of tourism growth on income for different ranges of control municipalities, based on their distance to the treated (beach) municipalities. The control municipalities are classified into six distance ranges: (1) 20-50 km, (2) 20-40 km, (3) 20-30 km, (4) 30-50 km, (5) 30-40 km, and (6) 40-50 km.

Figure A3.3.: Impact of tourism growth on income: varying distance cutoffs for treated municipalities



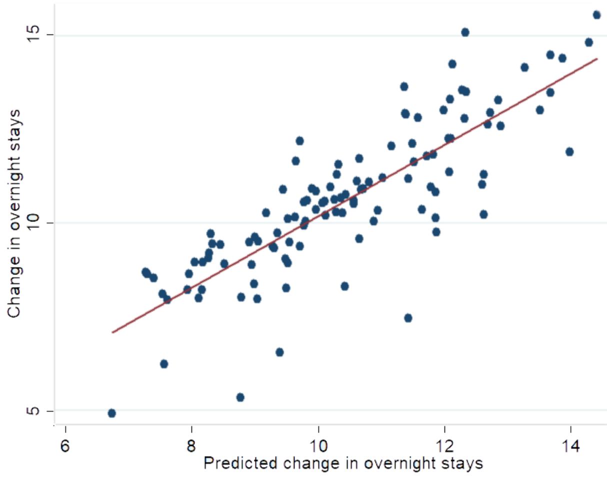
Notes: (1) This Figure presents the results of a sensitivity analysis examining the impact of tourism growth on income level in 2019 in different specifications. The analysis considers different treatment groups: (1) municipalities less than 10km far away from beach municipalities as the treated group, and municipalities >20km far away as controls; (2) municipalities 20km far away from beach municipalities as the treated group, and municipalities >30km far away as controls; (3) municipalities 30km far away from beach municipalities as the treated group, and municipalities >40km far away as controls; and (4) municipalities 40km far away from beach municipalities as the treated group, and municipalities more than 40km far away as controls.

Figure A3.4.: Impact of tourism growth on income levels: a sub-sample analysis by municipality size



Notes: (1) This graph shows the estimated impact of tourism growth on income level for different sizes of municipalities based on their surface area. The sample is split into five groups: small municipalities (with surface area up to 20 km^2), medium municipalities (with surface area between 20 and 90 km^2), large municipalities (with surface area over 90 km^2), medium and large municipalities combined, and all municipalities. The estimates are obtained using IV regression, where per capita tourism is instrumented by a dummy variable equal to one if the municipality has a beach and zero otherwise.

Figure A3.5.: Visual correlation between predicted and realized overnight stays in beach municipalities



Notes: (1) The unit of observation is the municipality. The dependent variable is log growth of realized overnight stays for the subsample of municipalities of realized overnight stays data available. Predicted overnight stays is calculated as described in section 4. (2) Robust standard errors are in parentheses and clustered at province level when adding province fixed effects. *, ** and *** denote statistical significance at the 10, 5 and 1 % level, respectively.

Table A3.1.: Descriptive statistics

Variables	count	mean	sd	min	max
Panel A					
Tourism per capita 1965	1196	13.82	88.56	0.00	2054.70
Tourism per capita 2019	1196	36.94	202.23	0.00	4454.32
Beach length	437	3691.88	4603.29	0.00	47320.96
Beach width	437	522.19	722.79	0.00	5873.76
Beach area	437	353507.99	668916.52	13.00	6641338.00
Share German residents 1996	437	0.01	0.02	0.00	0.18
Share Briton residents 1996	437	0.02	0.04	0.00	0.27
Share Dutch residents 1996	437	0.00	0.01	0.00	0.12
Share French residents 1996	437	0.00	0.01	0.00	0.05
Share Portuguese residents 1996	437	0.00	0.00	0.00	0.02
Share American residents 1996	437	0.00	0.00	0.00	0.07
Share Japanese residents 1996	437	0.00	0.00	0.00	0.00
Share Belgian residents 1996	437	0.00	0.01	0.00	0.07
Share Italian residents 1996	437	0.00	0.00	0.00	0.01
Panel B					
Log Predicted Income per capita 1965	1196	2.98	1.28	1.11	5.03
Log Predicted Income per capita 1990	437	2.71	0.95	1.80	4.82
Log Predicted Income per capita 1997	437	3.75	0.31	1.38	12.27
Log Income per capita 2019	1196	9.47	0.24	8.93	10.41
% Employed in manufacturing 2019	1196	15.55	15.43	0.00	84.22
% Employed in agriculture 2019	1196	18.34	19.71	0.00	80.28
% Employed in construction 2019	1196	9.14	5.69	0.00	49.44
% Employed in construction 2019	1196	9.14	5.69	0.00	49.44
% Employed in real estate 2019	1196	0.50	0.75	0.00	12.50
% Employed in hotels and foodservice 2019	1196	9.97	8.23	0.512	70.76
% Employed in ancillary services 2019	1196	2.69	3.07	0.00	55.48
% Employed in manufacturing 1990	437	1.3	0.9	0.00	9.5
% Employed in agriculture 1990	437	0.13	0.118	0.00	0.57
% Employed in construction 1990	437	12.78	11.7	0.23	85.9
% Employed in hotels and foodservice 1990	437	14.3	0.83	0.39	53.8

(Continued)

Table A3.1.: Descriptive statistics

Variables	count	mean	sd	min	max
% Secondary education age 25-36, 1991	1196	0.57	0.15	0.01	0.96
% Tertiary education age 25-36, 1991	437	0.07	0.04	0.01	0.26
% Tertiary education age 25-36, 2001	1196	0.17	0.08	0.07	0.49
% Tertiary education age 25-36, 2011	1196	0.22	0.12	0.00	0.86
% of temporary contracts	1196	0.94	0.06	0.38	1.00
% of immigrant workers	1196	0.05	0.05	0.00	0.43
Panel C					
Population 1950	1196	5138.00	5172.00	165.00	58768.00
Population 1990	437	9492.32	8570.71	57.00	50466.00
Temperature	1196	14.95	2.11	7.00	19.90
Precipitations	1196	6.75	2.76	1.06	15.57
Anual hours of sun	1196	2649.75	426.97	1600.00	3500.00
Altitude	1196	4.33	3.62	0.03	24.06
Ruggedness	1196	1.17	1.11	0.00	8.30
Surface	1196	84.13	110.25	0.73	969.01
Soil quality	1196	8.32	1.13	0.95	10.00
Agricultural production 1950	1177	0.32	0.17	0.00	0.95
Agricultural production 1990	437	0.14	0.12	0.00	0.57
Illiteracy rate 1930	1196	47.83	14.20	14.39	88.41
Illiteracy rate 1990	437	1.80	0.99	0.00	4.46

See Section 4 for a description of the datasets

Table A3.2.: Correlates of tourism

Variables	Coef. (1)	Std. Error (2)	Std. Beta. (3)	P-value (4)
Panel A: Beach				
Temperature	0.090***	(0.007)	0.281	(0.000)
Precipitations	-0.019	(0.029)	-0.022	(0.497)
Hour of sun	-0.075***	(0.011)	-0.204	(0.000)
Altitude	0.093	(0.076)	0.039	(0.224)
Ruggedness	-3.229***	(0.176)	-0.419	(0.000)
Surface	0.166*	(0.068)	-0.067	(0.015)
Soil quality	-0.046	(0.074)	-0.019	(0.531)
Share agricultural production 1962	-0.523***	(0.059)	-0.289	(0.000)
Illiteracy rate 1930	-0.034*	(0.020)	-0.050	(0.094)
Log population 1960	-0.451***	(0.052)	0.234	(0.000)
Panel B: Per capita tourism growth 1965-2019				
Temperature	0.006***	(0.001)	0.172	0.000
Precipitations	-0.023***	(0.004)	-0.221	0.000
Hours of Sun	0.004***	(0.000)	0.101	0.000
Altitude	0.014	(0.013)	0.050	0.313
Ruggedness	-0.085***	(0.029)	-0.093	0.003
Surface	0.021***	(0.006)	0.074	0.000
Soil Quality	0.019***	(0.006)	0.069	0.001
Share of Agricultural Production in 1962	-0.001	(0.003)	-0.007	0.667
Illiteracy Rate in 1930	0.005***	(0.001)	0.072	0.000
Log Population in 1960	-0.011***	(0.004)	-0.051	0.006

Notes: This table shows the correlates of Beach and per capita tourism growth. The unit of observation is the municipality. There are 1,196 observations included in each regression. Column (1) shows the point estimate for the regressor of interest. Column (2) shows the corresponding standard error. Column (3) corresponds to the standardized-beta and column (4) to the corresponding p-value.

Table A3.3.: Correlations between beach attractiveness metrics and tourism levels

VARIABLES	All beach municipalities (1)	Beach municipalities used in the analysis (2)
Beach length	0.591**	0.529*
	(0.270)	(0.291)
Beach width	0.825***	0.991***
	(0.188)	(0.207)
Temperature	0.773**	0.627*
	(0.303)	(0.339)
Precipitation	-0.228	-0.0893
	(0.263)	(0.298)
Hours of sun	0.218***	0.245***
	(0.188)	(0.165)
Observations	461	437

Notes: Each row reports the OLS estimate of regressing per capita tourism in 2019 on the variable indicated in each row separately. The unit of observation is the municipality. Column 1 shows the estimates for all municipalities with beach. Column 2 shows the estimates for the municipalities used in the main sample as explained in section 3.5. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A3.4.: Major nationalities contributing to Spanish tourism

2000		2010		2019	
Germany	0.234	United Kingdom	0.190	United Kingdom	0.185
United Kingdom	0.207	Germany	0.182	Germany	0.129
France	0.092	France	0.108	France	0.106
United States	0.063	Italy	0.071	United States	0.061
Italy	0.062	United States	0.051	Italy	0.057
Netherlands	0.038	Netherlands	0.037	Netherlands	0.037
Belgium	0.035	Portugal	0.035	Portugal	0.029
Portugal	0.035	Belgium	0.027	Belgium	0.024
Japan	0.029	Sweden	0.018	Japan	0.020
Switzerland	0.018	Rusia	0.018	Irlanda	0.019
Sweden	0.016	Japan	0.017	Rusia	0.018
Argentina	0.015	Switzerland	0.016	Sweden	0.017
Cumulative	0.828		0.771		0.703

Notes: The table displays the composition of international tourist inflows in 2000, 2010 and 2019. Only twelve countries with largest tourist inflows are displayed. The data source is the National Statistic Institute data on international arrivals to Spain.

Table A3.5.: Instrumenting tourism growth with beach characteristics: Impact on municipal income levels

	Panel A. IV, Dep. variable: Income level 2019				
	(1)	(2)	(3)	(4)	(5)
	length	+sun hours	+width	+temperature	+precipitations
Per capita tourism	-0.050**	-0.067***	-0.049**	-0.049**	-0.051***
growth (1965-2019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Mean dep. var.	9.49	9.49	9.49	9.49	9.49
	Panel B. First stage: Dep. variable: per capita tourism growth				
$\mathbb{1}$(Beach)	1.933***	3.480***	3.172***	3.173***	3.172***
Beach attractivness	1.028***	1.773***	0.150***	0.150***	0.147***
Kleibergen-Paap rk	27.172	27.596	27.636	27.752	26.987
LM F-stat.	[19.93]	[19.93]	[19.93]	[19.93]	[19.93]
Observations	1,196	1,196	1,196	1,196	1,196
All Controls	Y	Y	Y	Y	Y
Province FE	Y	Y	Y	Y	Y

Notes: (1) Panel A reports the IV estimates of tourism growth using IV regression, where per capita tourism is instrumented by $\mathbb{1}$(Beach), a dummy equal to one if the municipality has beach and zero otherwise plus *Beach attractiveness* which measures beach quality and panel B reports the First stage regressions. *Beach attractiveness* in column 1 is the standardized km of beach length, column 2 adds standardized hours of sun, column 3 adds standardized km of beach width, column 4 adds standardized temperatures and column 5 adds standardized precipitations. The unit of observation is the municipality; (2) Kleibergen-Paap rk LM F-stat. is the weak instrument test; in brackets we report the value of the Stock-Yogo weak ID test critical value at 10% maximal IV size. Robust standard errors are in parentheses and clustered at province level. *, ** and *** denote statistical significance at the 10, 5 and 1 % level, respectively.

Table A3.6.: Instrument validity for shift-share analysis: Overnight stays growth and municipal income

	Panel A. Dep. variable: Income level 2019		
	OLS	RF	IV
	(1)	(2)	(3)
Δ Realized overnight stays (1996-2019)	-0.014** (0.005)		
Δ Predicted overnight stays (1996-2019)		-0.029*** (0.001)	-0.029*** (0.009)
Mean dep. var.	9.49	9.49	9.49
	Panel B. First stage: Dep. variable: Predicted overnight stays		
Realized overnight stays			0.966***
Kleibergen-Paap rk LM F-stat.			16.86 [16.38]
Observations	96	96	96
All Controls	Y	Y	Y
province FE	Y	Y	Y

Notes: (1) Panel A reports the estimates of tourism growth measured by overnight stays as explained in section 3.4 on income level using the OLS, reduced-form and IV regressions results where the dependent variable is the log of income in 2019 and panel B the First stage where the independent variable is the realized overnight stays. The unit of observation is the municipality; (2) Kleibergen-Paap rk LM F-stat. is the weak instrument test; in brackets we report the value of the Stock-Yogo weak ID test critical value at 10% maximal IV size. Robust standard errors are in parentheses and clustered at province level when adding province fixed effects. *, ** and *** denote statistical significance at the 10, 5 and 1 % level, respectively.

Table A3.7.: Economic structure comparison: Proximity to beach municipalities. Treated vs. Control (10km vs. >20km cutoffs)

	Employment change by industry			
	Agriculture	Manufacturing	Construction	Hotels & foodservice
	(1)	(2)	(3)	(4)
Per capita tourism growth (1965-2019)	-0.109 (0.107)	-0.103 (0.087)	0.100 (0.102)	0.009 (0.053)
Observations	1452	1452	1452	1452
All Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y

Notes: (1) The table shows the reduced form estimates of the effect of per capita tourism growth on employment shares in different sectors. The treated municipalities are those that are within a 10km radius of the beach municipalities, while the control municipalities are those that are further away, at least 20km. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

Table A3.8.: Comparative impact of tourism growth on income levels: a sub-period analysis (1965-1996 vs 1996-2019)

	Income level	
	1996	2019
	(1)	(2)
Per capita tourism growth (1965-1996)	-0.038** (0.028)	
Per capita tourism growth (1996-2019)		-0.040*** (0.010)
Kleibergen-Paap rk LM F-stat.	18.88	19.52
	[16.38]	[16.38]
Observations	1,196	1,196
All Controls	Y	Y
Province FE	Y	Y

Notes: (1) The table shows estimates of tourism on income level. Columns (1) and (2) use per capita tourism as the independent variable, which is instrumented by the existence of a beach in a municipality. Column 1 uses the dependent variable the income level in 1996 and Column 2 the income level in 2019. The unit of observation is the municipality. (2) The Kleibergen-Paap rk LM F-statistic is used to test for weak instrument validity, with the critical value for the Stock-Yogo weak identification test reported in brackets at the 10% maximal IV size. Robust standard errors are reported in parentheses and clustered at the province level when province fixed effects are included. Significance levels are denoted by *, **, and *** at the 10%, 5%, and 1% levels, respectively.

Table A3.9.: Instrument validity: correlation of initial nationality shares with potential confounders

Nationality	Germans	Britons	French	Dutch	Portuguese
Population change	0.009	0.0318	0.0033	0.0065	-0.0002
Education level	0.000	-0.0022	-0.0010	-0.0014	-0.0000
Unemployment	-0.0006	0.0018	-0.0005	-0.0004	0.0000
Manufacturing industry employment	0.0105	0.0297	-0.0123	0.0984	-0.0162
Agriculture industry employment	-0.0119	-0.0550	-0.0059	-0.0098	0.0011

Notes: The table shows the correlations of the initial nationality shares across municipalities of the five tourist nationalities with the highest Rotemberg weights with several potential confounders. Changes refer to the period 1997-2019; Education, unemployment and shares by industry employment refer to the year 1990.

Table A3.10.: Other outcomes

	Unemployment level in 2019	Unemployment growth (1997-2019)	Population growth (1960-2019)	Population growth (1997-2019)
	(1)	(2)	(3)	(4)
Per capita tourism growth	0.002		0.806***	
	(0.002)		(0.354)	
Predicted overnight stays growth		0.461		0.038
		(0.322)		(0.063)
Mean dep. var.	0.07	0.51	0.97	0.22
Observations	1196	437	1196	437
All Controls	Y	Y	Y	Y
Province FE	Y	Y	Y	Y

Notes: (1) The table shows the the impact of tourism growth on the specified outcomes. The unit of observation is the municipality; (3) All columns control for pre-determined socioeconomic and geographic variables: population in 1950, illiteracy rate in 1930, income in 1965, agriculture production in 1960, tourism per capita in 1965, soil quality, altitude, ruggedness, surface, temperature, rainfall and hours of sun; (4) Kleibergen-Paap rk LM F-stat. is the weak instrument test; in brackets we report the value of the Stock-Yogo weak ID test critical value at 10% maximal IV size. Robust standard errors are in parentheses and clustered at province level. *, ** and *** denote statistical significance at the 10, 5 and 1 % level, respectively.

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