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ABSTRACT

Do More Tourists Promote Local Employment?*

We analyze the impact of tourist flows on local labor markets, following a novel identification strategy that uses temporary shocks in alternative international destinations to instrument for tourism flows across Spanish regions. We find that a one standard deviation increase in tourist inflows leads to a 1 percentage-point increase in employment in the tourism industry and in other services, but it does not increase total employment, labor force participation, or wages in local economies. Instead, the positive impact on services is compensated by a fall in employment in other industries, most notably manufacturing.

JEL Classification: J21

Keywords: employment, tourism, local labor markets, shift-share, terrorism, Spain

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1. Introduction

Tourism is a steadily growing sector across the world. It is at the forefront of the economic and political agenda in tourist-receiving countries. Yet, we know little about the impact of tourism on local economies, mainly due to the identification challenges posed by the endogeneity of tourist destinations and the local investment in infrastructure and development. We study the effect of tourist inflows on local labor markets using a novel identification strategy that addresses those challenges. Focusing on the context of a top tourist destination country (Spain), we exploit temporary shocks to the attractiveness of alternative destinations as an instrument to measure the impact of tourist inflows into Spanish provinces. Using terrorist attacks abroad, which decrease the appeal of other destinations and thereby increase the relative attractiveness of Spain, we find that higher tourist inflows into a region lead to increases in employment in the tourism sector and in other services, but do not increase total employment or participation. Instead, an increase in employment in services is fully compensated by a drop in manufacturing employment. These dynamics are accompanied by a drop in wages, mainly in the manufacturing sector, suggest a shift of economic activity from industry towards tourism.

While manufacturing has suffered a steady decline in the United States and across Europe, countries have been turning to the service sector as an alternative source of long-term growth and employment. The tourism sector has been gaining particular relevance. In 2019, its contribution to the world GDP exceeded 10 percent, and it accounted for 330 million jobs worldwide.[1] Countries like France, Spain, the United States, China, Italy, Turkey, and Mexico, all attract tens of millions of tourists annually.[2] Even countries that do not rely heavily on tourism overall often have regions that do.[3] When it comes to employment, tourism is quantitatively as important as manufacturing across a number of countries.

Despite its economic importance, the role of the tourism industry as a driver for economic growth is still debated (see for instance Faber and Gaubert 2019), while the effect of tourism

[1] According to the World Travel & Tourism Council (WTTC), https://wttc.org/Research/Economic-Impact (consulted on August 30, 2024).
[2] In other countries, tourism is the single most important export category, accounting for 20 percent of exports in New Zealand, Cyprus and Thailand, exceeding 25 percent in Greece and reaching nearly 40 percent in Croatia and the Dominican Republic. Source: World Tourism Organization (2020), Compendium of Tourism Statistics dataset, UNWTO, Madrid, data updated on 20/01/2020.
[3] While only 6 percent of Austrian full-time employment was in tourism in 2018, in the Alpine Tyrol region every third job was in a tourism-related activity. https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/base-profile/tyrol (consulted on November 24, 2020).

on local labor markets has not been studied in depth. This is particularly surprising given how strongly local and central governments invest in and promote the tourism industry, and how heavily some regions seem to rely on tourism-led demand for employment.[4]

This paper seeks to understand the local labor market consequences of transitory shocks to tourism flows. We focus on Spain, which is the second most popular tourist destination worldwide and has experienced an unprecedented increase in tourist inflows over the last 20 years. The tourism industry lies at the forefront of its economic agenda, and in some regions tourism-related employment accounts for nearly a third of total employment. In popular destinations, such as Barcelona, tourism is perceived to have had a deep impact on local real estate, hospitality, other services, and welfare (Allen, Fuchs, Ganapati, Graziano, Madera, and Montoriol-Garriga 2021; Almagro, and Dominguez-Iino 2021). The case of Spain is similar to other popular tourist destinations in Europe, such as Italy, France, or Greece.

How does tourism affect local employment? In order to answer this question, it is crucial to take into account the endogeneity of tourist inflows. Controlling for regional heterogeneity via fixed effects, we show that higher inflows of tourists are strongly and positively associated with (local) tourism-related employment, labor market participation, and total employment. However, regions that attract tourists tend to be more densely populated, have a history of economic development, lie on the coast, and have more favorable climate, factors that likely put them on differential development trends. Furthermore, local investment in infrastructure and regional promotion of tourism may in itself have employment-generating effects. Hence, a fixed-effects estimator fails to address the identification challenges posed by tourism inflows. To address this endogeneity between tourist inflows and local development, we propose using shocks to the attractiveness of competing (international) tourist destinations. In particular, we use terrorist attacks in alternative destinations, alongside similar shocks in Spain, to instrument for tourist inflows to (different regions in) Spain.[5]

[4] The high seasonality of tourism, and thus economic activity related to tourism, makes the industry and the local labor markets that are heavily reliant on the tourism industry strongly susceptible to ill-timed shocks.

[5] The relationship between terrorism and tourist flows (in the same location) has been addressed in previous economic research (e.g. Enders and Sandler 1991; Enders, Sandler, and Parise 1992; Neumayer 2004; Neumayer, and Plümper, 2016; Besley, Fetzer and Mueller 2020) and in the mainstream press. For instance, Spain experienced a strong growth in tourist arrivals in 2016, a year which was particularly bad in terms of terrorist activity elsewhere in Europe. The press has repeatedly pointed out this link, which we approach in a systematic manner and use to study the impact of tourism on local labor markets elsewhere.

For this purpose, we combine (i) Spanish FRONTUR data that contains information on the inflow of tourists across Spanish provinces by country of origin; (ii) World Tourism Organization (UNWTO) data on bilateral tourist flows for most countries in the world; (iii) data on worldwide terrorist activity from the Global Terrorist Database, and (iv) Spanish Labor Force Survey and Social Security data. The main challenge lies in determining the differential impact of global terrorist activity across specific Spanish regions. Our strategy consists of exploiting local variation in the tourist mix by country of origin across Spain, and the variation in alternative destinations for each source country of tourists. In other words, our approach relies on "distributing" the shocks across regions within Spain, according to the pre-established regional composition of tourist inflows. This strategy is in the spirit of shift-share instruments, as in Bartik (1991). The exclusion restriction is that terrorist attacks in other countries do not affect Spanish local labor markets except through their impact on tourist inflows to Spain.[6] Note that the main competing destinations for Spain are other European countries, but most terror attacks take place outside of Europe.[7]

We assign the level of exposure to terrorist activity in other countries across Spanish regions in two steps. First, we identify the most relevant alternative destination countries that compete for tourists with Spain. We use the information on terrorist shocks across all countries to estimate how much these shocks affect tourists from the different origin countries, depending on each destination's weight in total tourism outflows from each origin. Then, we calculate the mix of origin countries among the tourists that visit each Spanish province. We "assign" shocks to Spanish provinces using the weight of each country of origin in total tourist inflows to a province, and how affected is each origin country by terrorist incidents in their competing destination countries.

We find that a 10 percent increase in a province's exposure to these international shocks (about 14 percent of its standard deviation) increases the inflow of tourists by 2 to nearly 5

[6] We treat shocks to the attractiveness of alternative destinations as exogenous. The distribution of the shocks across the regions (i.e. the "shares") does not need to be exogenous for our strategy to produce consistent estimates (Borusyak, Hull and Jaravel, 2022: "identification follows from the quasi-random assignment of shocks, while exposure shares are allowed to be endogenous.").

[7] Over the last 20 years, attacks have moved from domestic to transnational, with perpetrators' identity moving from domestic terrorist cells, such as ETA in Spain and IRA in Ireland, to those linked to foreign organizations such as Al-Qaeda and Islamic State, or lone domestic extremists. Attacks have also become less geographically clustered. It is unclear a priori which types of attacks have the largest consequences on tourist flows, and we explore this dimension in our analysis.

percent. The effect is strongly significant, even when we control for province fixed effects and allow for flexible region-specific trends. In other words, shocks in alternative destinations prove to be a strong instrument for the inflow of tourists to Spanish regions. Using local labor markets' exposure to the shocks in alternative destinations as an instrument, we find a near zero short-term impact on the overall employment or labor market participation in a province. Instead, the analysis of sector-specific employment reveals that, while tourist inflows seem to spur job creation in tourism and other services, this positive employment effect is compensated by a negative effect on manufacturing employment. In spite of this, we document an increase in total hours worked, alongside negative effects on local wages. These baseline results are highly robust to a number of alternative specifications.

Since the shocks that we exploit are arguably short-lived, the immediate employment responses to these shocks are likely to represent a lower bound on their total effect. Spain has experienced very high unemployment rates over the last 20 years, and thus the employment response to any shocks is expected to be relatively quick. To validate these results and to establish a conversation with other papers in the literature (most notably Faber and Gaubert 2019), we also employ an alternative instrumental variable approach that relies on region-specific tourist attractiveness interacted with a time trend. The instrument is based on two observations: (i) provinces with an access to the Mediterranean coast and those with higher density of historical and cultural sites attract more tourists; (ii) tourist inflows have been on a strongly positive trend over the last two decades due to a drop in the cost of travel. In line with other papers in the literature, this instrument distributes the total increase in tourist inflows across provinces based on their geographic and cultural characteristics. Using this alternative identification strategy, we document a very similar pattern of estimates for the longer-term impact of tourism on local employment.

In further analyses, we show that the increase in tourism-related employment comes with a drop in employment quality, measured by wages as well as the type of contract, and an increase in the share of full-time contacts, so that the total number of hours worked increases, driven by the increased activity in the tourism sector. We also find a high degree of heterogeneity in the impact of tourism on employment by gender and skill group. The negative effect on employment in non-tourism sectors is concentrated among women, while the increase in tourism-related employment is stronger for men. Furthermore, the increase in tourism employment is concentrated among low-skilled workers.

We contribute to several strands of literature. First, we speak to the literature on the impact of economic shocks on local economies (Autor, Dorn and Hanson 2013, 2016; Mian and Sufi

2009; Topalova 2010; Black, McKinnish and Sanders 2003; Kearney and Wilson 2018; among others). We study the impact of (positive) shocks to the tourism sector on regional economies in Spain. While others have focused on demand shocks affecting the manufacturing sector, shocks to other sectors could have very different labor market impacts due to the distinct demographic composition of these sectors. More importantly, while the manufacturing sector has experienced a secular decline, the opposite is true for tourism, which makes it particularly important to understand how employment responds to shocks to this industry.

By using terrorist attacks as an instrument for tourist inflows, this paper relates to the literature on the economic impacts of violence (e.g. Abadie and Gardeazabal 2003, 2008; Besley and Mueller 2012; Brodeur 2018; Krueger and Malečkova 2003; among others). Besley et al. (2020) study the impact of terrorism on tourism into the countries directly affected by the terrorist incidents, with a focus on the role of media coverage. This type of effect is the starting point of our identification strategy. We are not interested in the direct impact of terrorism on tourism in the same country, but rather use it as a shifter to tourist flows towards competing destinations (in our case, Spain).

Our main goal is to contribute to the understanding of the economic impact of tourism. The conventional view in the literature appears to be that long-term economic growth is driven by sectors more subject to improvements in productivity and technology, e.g. manufacturing (Herrendorf, Rogerson and Valentinyi 2014). Nevertheless, economic research has documented a positive association between tourist activity and country-level GDP (Sequeira and Maçãs Nunes 2008, Arezki, Cherif and Piotrowski 2009, Chen and Ioannides 2020).[8] Most of these studies use country-level data, and acknowledge the limitations of their identification strategy in terms of accounting for the endogeneity of tourist activity.

Faber and Gaubert (2019) is a notable exception. They study the long-term impact of tourism on the development of local economies in Mexico, with a specific focus on general equilibrium effects. Our approach is complementary to theirs along several dimensions. Our focus is on the effects of tourism within local labor markets, in a high-income country. Faber and Gaubert (2019) report a reallocation of economic activity towards regions that tend to attract tourists, while we find that the positive impact of tourist inflows on employment in services, including tourism, is in fact compensated by a loss of manufacturing employment. We document these findings using two different identification strategies, one of which speaks directly to the one used in Faber and Gaubert (2019).

[8] See also Brida, Cortes-Jimenez, and Pulina (2016) for a review.

Also related is a recent study by Nocito et al. (2023), who exploit the role of entertainment media in affecting tourist flows and local economic activity. They show that the international release of a TV show filmed in several Sicilian municipalities led to higher tourist inflows and, in turn, increases in employment in the tourism sector. Our contribution lies in proposing a different and novel source of identification that can also be used in other settings, based on international rather than local shocks, which affect inflows towards all regions.

Finally, in line with the existing literature on labor market dynamics, our paper connects with previous studies that explore how demand shocks and sectoral shifts influence local economies. Beaudry, Green, and Sand (2012) highlight the positive cross-industry spillovers that can arise from the presence of high-quality jobs, which can improve workers' outside options and exert upward pressure on wages across sectors. In contrast, our findings show that the expansion of low-wage tourism jobs contributes to downward pressure on wages in other sectors, particularly manufacturing, thus weakening workers' bargaining power and reducing overall wage levels. We also build on Bustos et al. (2023), who examine how labor-saving agricultural innovations can lead to reallocation of labor towards low-skilled manufacturing, impacting overall productivity. Consistently, we show that a positive demand shock in the tourism sector causes labor to shift from manufacturing to tourism, leading to a decrease in manufacturing employment and wages. Also relatedly, Fabra et al. (2024) study the localized employment effects of renewable energy investments in Spain, focusing on spatial employment effects driven by short-term demand shocks. While they emphasize regional shifts, our study reveals cross-industry labor reallocation, illustrating how such shifts, particularly from manufacturing to tourism, can exacerbate the downward pressure on wages and job quality. We thus contribute to our understanding of how external shocks affecting specific sectors can influence the wage structure and employment patterns across industries and regions.

All in all, our results suggest that the growing relevance of tourism may not be an optimal long-term growth strategy as envisioned by some policy-makers. Not only do we find no evidence that tourism increases total employment, but the type of employment generated in tourism tends to be temporary, low-skilled, and low-wage.

The remainder of the paper is structured as follows. In section 2 we outline our empirical strategy. We describe the data in section 3, and discuss the background and summary statistics in section 4. We present our results in section 5, while section 6 concludes.

2. Empirical strategy

2.1. The impact of tourism on local labor markets

The question at the heart of this paper is how tourism affects local labor markets. We are particularly interested in the extent to which higher tourist inflows may lead to higher employment and labor market participation in a region. We start by analyzing the empirical association between the inflow of tourists to a province and the level of employment in tourism- and non-tourism-related activities, as well as total employment, labor market participation, and hours of work in the receiving province. For this purpose, we estimate the following two-way fixed-effects regression:

$$y_{idq(t)} = \beta_0 + \beta_1 \, log\, flow_{dq(t)} + X'_{iq(t)}\gamma + \mu_d + \mu_{r(d)q(t)} + u_{idq(t)} \quad (1),$$

where $y_{idq(t)}$ is an indicator for employment, labor market participation, or sector-specific employment (tourism-related vs. other) for individual i who lives in a province d in quarter q of year t. Our main explanatory variable, $log\, flow_{dq(t)}$, is the (log) number of tourists arriving to a province d during the quarter,[9] while μ_d and $\mu_{r(d)q(t)}$ are province and region-specific quarter-year fixed effects.[10] The vector of individual controls $X_{iq(t)}$ includes age, education, and immigrant status. Our coefficient of interest β_1 is the semi-elasticity of local employment with respect to contemporaneous tourism inflows.

The development of the tourism sector likely goes hand in hand with overall economic growth in a tourist destination. As regions invest more into the development of tourist facilities, improved security, expanding the supply of accommodation, as well as tourism-related services in general, the associated increase in employment will be accompanied by higher inflows of tourists, attracted by these "pull" factors. To identify the causal impact of tourist inflows on the labor market, we need to address these confounders.

2.2. Security shocks in competing destinations and tourism to Spain

Our identification strategy relies on exploiting shocks that affect the attractiveness of alternative tourist destinations and thus may divert tourist inflows towards Spain. The appeal

[9] We also estimate alternative specifications where the explanatory variable is measured as inflows over province population.

[10] We classify the 52 provinces into 10 regions, with similar geographic characteristics: i) Islands: Balearic and Canary Islands; ii) Centre: the two Castiles, Madrid, and Rioja; iii) North: Asturias, Cantabria, Navarra, and Basque Country; iv) Valencia and Murcia; v) Autonomous cities: Ceuta and Melilla; vi) the remaining five regions correspond to the Autonomous Communities of Catalonia, Aragon, Galicia, Andalusia and Extremadura.

of a given tourist destination is a function of fixed factors, such as geographic characteristics, climate, historical relevance, and cultural prominence, as well as time-varying factors such as prices, political stability, and security. Our first and main approach focuses on security shocks that affect countries that compete for tourists with Spain.

Terror attacks have been shown to decrease tourist inflows to a country (e.g. Besley et al. 2020). We posit that those tourists may instead choose to travel to other destinations. Hence, our identification strategy exploits terrorist attacks as shocks that affect the (perceived) safety of tourist destinations. We focus on total tourist flows into a province (both domestic and international). While international tourism is a major part of Spain's exports and is expected to be especially susceptible to security shocks, domestic tourism may be responsive to both the shocks in alternative destinations and to the ensuing inflows of international tourists. Therefore, we use total inflows, and aim to identify the total impact of tourism on local labor markets.

The challenge lies in linking global shocks to local labor markets in Spain. Our strategy proceeds in two steps. First, we quantify the popularity of the countries affected by each shock among tourists from different origins. We then use the composition of tourist outflows to aggregate the exposure to these shocks at the country of origin level. Second, we analyze the regional composition of international tourist inflows into Spain, using the importance of each origin country in each region to aggregate the exposure to the shocks to the regional level within Spain.

The idea is that not all countries in the world compete for tourists with Spain to the same degree, and this competition depends on the tourist composition both within Spain and globally. We illustrate our first step (***outflows***) in Figure 1 (and Appendix Table B1), which shows shares of tourist outflows from the United Kingdom, Germany, France and the United States. While some countries are generally popular tourist destinations, their popularity varies by origin. For instance, Austria is a popular destination for tourists from all the countries listed in Table B1, but it is especially popular among German tourists, with 12 percent visiting annually, compared to only 1 percent from the United Kingdom, France, or the United States. Therefore, any shock occurring in Austria will be felt in Spain more strongly through its impact on German tourists than on British, French or American.

On top of that, not all regions in Spain would be affected to the same degree. Regions that tend to receive more German tourists will be more exposed to shocks in Austria compared to regions less reliant on them. This idea (our second step, ***inflows***) is illustrated in Figure 2 and Appendix Table B2, both of which depict the composition of international tourist inflows across Spanish regions. The Balearic Islands, for instance, heavily depend on German tourism, with an average of 49 percent of international tourists coming from Germany over the period. In contrast, in Alicante, German tourists account for about 4 percent of international arrivals. Therefore, the Balearic Islands will be considerably more exposed to any shock in Austria than Alicante.

Formally, the first component of our instrument is the (lagged) share of tourist ***outflows*** from each country of origin that corresponds to each destination country:

$$OUT_{ojt} = \frac{outflow_{oj(t-1)}}{outflow_{o(t-1)}} \quad (2)$$

Where $outflow_{oj(t-1)}$ is the number of tourists arriving from country o to an alternative destination j in year $t-1$, and $outflow_{o(t-1)}$ is the total tourist outflow from country o in that year.[11] We display the distribution of these shares in Figure 1 and (in percentages) in Appendix Table B1, for a subset of tourist origins and years.[12] Most countries have relatively stable popular destinations, but we also see some changes over time. For example, the top destination competing with Spain for UK tourists is France throughout the period (see Table B1), while Italy is the main competitor for French tourists. However, for German tourists, Italy overtakes France as the main alternative destination by 2018.

The second component of the instrument is the distribution of tourist ***inflows*** from different (international) origins across Spanish provinces:

$$IN_{dom(t)} = \frac{inflow_{dom(t-1)}}{inflow_{dm(t-1)}} \quad (3)$$

Where $inflow_{dom(t-1)}$ is the inflow of tourists from country o to Spanish province d in month m of year $t-1$, while $inflow_{dm(t-1)}$ is the total tourist inflow to that province in month m in that year. Again, we take the lagged share of inflows. In particular, we use the share corresponding to calendar month m in year $t-1$, in order to account for the seasonality of tourist inflows. This component is shown in Figure 2 and (in percentages) in Appendix Table B2 for some tourist origins and years. For example, Barcelona receives a lot of tourists from

[11] To avoid the reflection problem (Manski 1993), we take the lagged share of outflows. Alternatively, we can set the shares fixed using the value at some early period (or longer lags). There is a trade-off between identifying a more stable set of alternative destinations and the power of the instrument (as noted in Borusyak et al. 2022, section 4.3). We show that our main results are robust to using fixed shares.

[12] See the link in the note to Figure 1 for a video illustrating how outflow shares change over time.

the UK, Italy and France, while Madrid's top source country is the US, and the Balearic Islands have very high inflows of Germans.[13]

We quantify the shocks to security, $Shock_{jm(t)}$, as the number of terrorist attacks (with casualties) occurring in a given month m of year t, in country j.[14] We accrue these shocks to each Spanish province using OUT_{ojt} and $IN_{dom(t)}$ as weights, where the former reflects the importance of each alternative destination for each country of origin of tourists, and the latter reflects how important each tourist country of origin is for each Spanish province:[15]

$$IV_{dm(t)} = \sum_{j} \sum_{o,m(t)} (IN_{dom(t)} \times OUT_{m(t)oj}) \times Shock_{jm(t)} \quad (4)$$

Given the quarterly nature of the labor market data, we aggregate the instrument to the quarterly level. To account for the fact that the effect of shocks occurring early in the quarter may wear off, we assign higher weight to those shocks that occur later in each quarter.[16] Note that both OUT_{ojt} and $IN_{dom(t)}$ are time-varying shares. Allowing for the shares to vary over time improves the relevance of the instrument, without compromising exogeneity.[17]

Our first stage tests whether and how the shocks to alternative destinations relate to tourist inflows in each Spanish province. We regress the log number of arrivals to a province on the province's exposure to the shocks in alternative destinations in a given quarter:

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[13] See link in the note to Figure 2 for a video illustrating how inflow shares change over time. Changes are relatively small. For example, Table B2 shows that the top-5 tourist origins in Barcelona remain the same over the period, as do the top-4 in Madrid and the top-2 in the Balearic Islands.

[14] In our main specification we include all shocks, including those taking place in Spain. While shocks in other countries are expected to divert tourism towards Spain, those within Spain are likely to have the opposite effect. Our instrument is designed to capture both types of effects. We test the robustness of our results to excluding shocks that occur in Spain and find that our main findings remain unchanged.

[15] The procedure entails double tensor contraction. First, over countries of origin of tourists, o, and month, $m(t)$, to generate a weight that varies by province of destination, d, and alternative origin, j. Second, over alternative origins to assign shocks across destination provinces in any given month. Notice that in order to perform the first contraction we expand OUT_{ojt} so that $OUT_{ojm(t)} = \sum_t OUT_{ojt} \times I_{tm(t)}$.

[16] We assign weights 1/6, 2/6 and 3/6 to shocks occurring in the first, second and third month in each quarter, respectively. Given the arguably ad-hoc nature of these weights, we test the robustness of our results to the use of alternative weights. This particular specification is the one that delivers the strongest first-stage estimates and for this reason we select it as a the preferred one. The results are highly robust to alternative specifications of the instrument.

[17] From Borusyak et al. (2022), section 4.3: "while fixing exposure shares may have the advantage of isolating cleaner time-varying shock variation, it may also have an efficiency cost."

$$log\,flow_{dq(t)} = \alpha_0 + \alpha_1\, log\, IV_{dq(t)} + \delta_d + \delta_{r(d)q(t)} + e_{dq(t)} \quad (5)$$

where log $flow_{dq(t)}$ is the log number of tourists arriving to province d in quarter q of year t, and log $\mathrm{IV}_{dq(t)}$ is the log number of (weighted) shocks that province d is exposed to in quarter q and year t. To control for region-specific trends in tourist inflows, the regression includes region-quarter-year fixed effects $\delta_{r(d)q(t)}$ (see footnote 10 for the definition of regions). Province fixed effects, δ_d, are included to allow for observed and unobserved time-invariant differences between provinces, such as geography or climate, that attract more or less tourism. Given that the shocks the provinces are exposed to come from the same underlying terrorist attacks, there might be cross-province correlation in the residuals. For this reason, we cluster standard errors at the quarterly level.[18] Then, to estimate the impact of tourism on local labor markets in our two-stage least square regressions, we estimate Equation 1, where $log\,flow_{dq(t)}$ is instrumented by log $IV_{dq(t)}$ as defined above.

Our identifying assumption is instrument exogeneity (conditional independence), which in our setting implies that the shocks (the number and location of terror attacks in a given quarter) affect employment in a particular Spanish province only through changes in contemporaneous tourist inflows into the province (after controlling for province and time fixed effects). Our identification strategy allows us to identify local average treatment effects (LATE), i.e. the impact of tourist inflows driven by terror attacks in alternative international destinations. In our setting, the marginal tourist is one that would react to a terrorist attack in a potential destination by traveling to Spain instead. In that sense, we should think of compliers as tourists at the margin between choosing Spain versus an alternative destination (where there is a terrorist attack).

2.3. Alternative instrument: Access to the coast and national patrimony

Our main identification strategy exploits security shocks and the attractiveness of alternative destinations. In this section, we specify an alternative approach that instead exploits natural and cultural attractiveness of each region in Spain. Reminiscent of the strategy used in Faber and Gaubert (2019), we exploit province-level variation in coast length, access to the Mediterranean, and the density of sites inscribed in the World Heritage List to instrument for tourist inflows. All of these features are fixed characteristics of a province and therefore are

[18] We also explore the robustness of our results to clustering our standard errors at the province level. Since there are only 52 clusters, the efficiency of these standard errors is limited. Note that the issue of serial correlation within province is partially addressed by controlling for province fixed effects as well as region-specific time fixed-effects.

absorbed by the province fixed effects, as in Equation 1. Rather than exploiting such cross-sectional variation in province attractiveness, we use the fact that tourism to Spain has accelerated substantially over the last two decades. We illustrate this trend in Figure 3, which shows the annual number of tourist inflows and the share of international tourists as a percentage of total arrivals between 2000 and 2018. Driven by the proliferation of cheap air travel and the expansion of the Schengen area and the list of countries that benefit from a visa-upon-arrival regime, most tourists arriving to Spain remain largely European and often look for sand and sun (see Appendix Table B3 for the composition of international tourist inflows in 2001, 2009, and 2018). We exploit these empirical facts and interact province characteristics with a linear time trend, thus allowing for the inclusion of province fixed effects when estimating the impact of tourism on local labor markets. The first stage is given by the following equation:

$$log\,flow_{dq(t)} = [\eta_1\, log\,CLth_d + \eta_2 Med_d + \eta_3\, log\,CLth_d \times Med_d + \boldsymbol{Ptr_d}'\boldsymbol{\theta}] \times t$$
$$+\delta_d + \delta_{rq(t)} + \epsilon_{dq(t)} \quad (6)$$

Where $log\,CLth_d$ is log length of the coast measured in kilometres of province d, Med_d indicates whether a province d has access to the Mediterranean coast, and Ptr_d is the count of sites designated as UNESCO patrimony in a province.[19] The interaction between the coast length and the access to Mediterranean captures the difference in the types of beaches on the Mediterranean versus the Atlantic coast, and, most importantly, the differences in the climate: the Atlantic coast is characterized by the oceanic climate, with lower average temperatures and more rainfall. All of these are interacted with a linear time trend to capture that the “natural” attractiveness of some provinces versus others may lead to differential trends in tourist inflows.[20] As in Equation 5, we control for province fixed effects and region-specific time trends, thus exploiting changes in tourist inflows generated by the interaction between the attractiveness of the province and the long-term change in tourism trends.

3. Data

We combine data from several sources. We use Spanish Labor Force Survey and Social Security data for labor market outcomes. To measure the evolution of tourism to Spain, we use FRONTUR data from the National Statistical Office of Spain. To build the instrument, we

[19] We allow for a different coefficient for each count of sites, going from 0 to 1, 2, and 3. Only one province, Madrid, has 5 sights, so we bin it into the same category as Barcelona, Leon, A Coruña and Tenerife (with 3 sites each).
[20] We also explore a more flexible, quadratic specification of the time trend.

combine the FRONTUR data with UNWTO data on outbound tourism from the 21 countries of origin of tourists identified from FRONTUR, while the data on worldwide terrorist attacks come from the Global Terrorism Database. Finally, we also draw information on coast length from the National Geographic Institute of Spain, and the number of World Heritage sites from UNESCO.

3.1. Labor Force Survey

Our micro data on employment comes from the quarterly Spanish Labor Force Survey. The survey covers a representative sample of around 65 thousand households across all of Spain in each quarter. We focus on years 2000 to 2018. The survey provides information on individual employment status, participation, and employment characteristics (but not on earnings). It also includes questions on individual demographic characteristics including age, education, migration status, and nationality.

3.2. Social Security

We build a panel of daily (full-time-equivalent) wages from the Continuous Sample of Employment Biographies. This data set provides information on the working histories of a representative sample of 4 percent of individuals affiliated with Social Security in each year. We combine the samples extracted in years 2004 to 2018 to construct a representative sample of salaried workers by quarter (and province).

3.3. Frontur

The information on tourist inflows across Spanish regions is based on the Hotel Occupancy Survey (HOS). HOS is a monthly survey filled by approximately 9,250 and 11,200 establishments in winter and summer, respectively. The sample covers all types of accommodation establishments, stratified by province and category.[21] The survey provides information on the number and origin of travelers arriving to each establishment and staying at least one night, as well as the duration of the stay.[22] We use data aggregated by the National Institute of Statistics (INE) that provides information on the number and origin of tourists

[21] These include hotel, aparthotel, motel, hostel, boarding house, inn, and guest house. The whole population of 4- and 5-star hotels is surveyed. In larger cities and popular tourist destinations, e.g. Madrid, Barcelona, Valencia, and Granada, among others, between 1/3 and 2/3 of 3- and 2-star hotels are surveyed.

[22] The survey does not cover rentals through platforms such as Airbnb, TripAdvisor, or Expedia. Up to the date of writing, the data from these types of platforms has not been incorporated into the official statistics.

arriving to each province in each month, and focus on the period 2000-2018. The data covers all major tourist origin countries.[23]

3.4. World Tourism Organization (UNWTO)

To identify tourist destinations that compete with Spain, we use the annual outbound tourism data provided by the UNWTO. Specifically, we use data on the bilateral tourism flows from the 21 origin countries covered by FRONTUR to 196 possible destinations. The data are supplied by each destination country, and information sources may vary across countries.[24] Several series are reported in the data: (a) arrivals of non-resident tourists at national borders, by nationality or residence; (b) arrivals of non-resident visitors at the border, by nationality or residence; (c) arrivals of non-resident tourists in hotels and similar establishments, by nationality or residence; and (d) arrivals of non-resident tourists in all types of accommodation establishments, by nationality or residence.

Although the main series is the arrivals of tourists at national borders, either by nationality or residence, some destinations report only visitors or arrivals at hotels. Some of these series are closely related, so the differences in reporting are not necessarily problematic. Nevertheless, to avoid possible biases when calculating the composition of outbound tourism and therefore identifying the competing destinations, we convert all the series into arrivals of tourists at national borders by residence. For this purpose, we use as conversion factors the cross-series correlations adjusted for year and origin-destination effects, based on the origin-destination pairs that report several series at once (see Appendix Table B4).

3.5. Global Terrorism Database

Information on terrorist attacks in competing destinations is drawn from the Global Terrorism Database (GTD), the most comprehensive unclassified database on terrorist attacks. The GTD defines a terrorist attack as the use of illegal force or violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation. For each incident recorded, the GTD collects information on date and place, type of attack, weapon used, number of casualties and, if known, perpetrator. Using the GTD, we build a monthly panel

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[23] We focus on the subset of 21 origin countries consistently covered by the survey throughout the period. These are Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, Russia, Sweden, United Kingdom, and United States. Japan is not covered in years 2005 and 2006, and between 2000 and 2004 inflows from Switzerland and Liechtenstein are bundled together. Inflows from the rest of countries are aggregated by region or continent.

[24] For instance, not all countries report the exact breakdown by country of origin, while others report only the most important countries of origin.

containing the total number of terrorist incidents, the number of incidents with casualties, and the number of casualties, for all the countries covered in the GTD.[25]

3.6. Data on coast length and national patrimony

The data on coast length comes from the National Geographic Institute of Spain (*Dirección General del Instituto Geográfico Nacional*). It measures the length of access to the sea in kilometers. The number of national patrimony sites was obtained from UNESCO and manually matched to each province.[26] Most of these sites are of cultural interest, while a minority are of natural or mixed character.

4. Descriptive statistics and sample

4.1. The tourism sector in Spain

Spain is the world's second most popular international tourist destination, with 85 million arrivals in 2023 (UNWTO), and tourism-related services account for a large share of the Spanish economy. In 2022, the contribution of tourism to Spain's GDP was 12 percent (National Statistical Office, 2024), while tourism-related employment oscillated around 12-13 percent of total employment over the last two decades, with a definite upward trend over the last ten years, driven strongly by the hospitality industry (see Figure 4).

Not all Spanish regions rely equally on tourism. The employment share in tourism-related activities is considerably higher in provinces along the Mediterranean coast and in the islands, and lower in the center, with the notable exception of Madrid (as shown in Figure 5). Appendix Table B5 shows the employment shares in tourism across Spanish regions in 2001 and 2018. In 2018, nearly 30 percent of employment in the Canary and Balearic Islands was accounted for by tourism-related services, while in La Rioja the share was less than 8 percent. Employment shares have also increased over time for the majority of provinces in Spain, and where it didn't, it mostly remained unchanged.

In terms of the type of tourism, about half of total tourist inflows are international arrivals, and their share has been increasing over the last decade, from just above 40 percent in 2010 to nearly 52 percent in 2018 (see Figure 3). The composition of international tourists remained relatively stable over the last two decades, growing slightly more diversified over time due to the emergence of tourism from Russia, China, and other Asian countries (see Appendix Table

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[25] We exclude from the count non-armed assaults, assaults on infrastructure, and unknown incidents, and thus focus on those that we define as severe, including assassinations, hijackings, kidnappings, bombings, and armed assaults.

[26] https://whc.unesco.org/en/statesparties/es (Sites that covered more than one province were counted as belonging to all of them.)

B3). The top three countries of origin over the last 20 years remained the same: Germany, United Kingdom, and France. Arrivals from these three countries accounted for 55 percent of total international arrivals in 2000 and 44 percent in 2018.

There is quite a lot of regional variation in tourist composition. For instance, over the last 20 years international tourism accounted for at most 17 percent of all arrivals to Asturias, while at least 61 percent of tourists who come to Barcelona are international arrivals, with the share reaching 74 percent in 2018. The composition of international arrivals also varies to a great extent across provinces, as illustrated in Appendix Table B2 and Figure 2.

In sum, tourism-related activities take up a large share of employment in Spain, but there is important variation in tourism-related employment shares across regions. The type of tourists also varies across regions, with some relying strongly on international arrivals while others mostly receive domestic tourists. Finally, the composition of international tourists by country of origin differs by region as well, with some, like the Balearic Islands, relying strongly on German tourists, and others, like Alicante, on British ones, and provinces with large cities, like Madrid, with more heterogeneous flows.

4.2. Alternative destinations

The variation in the regional composition of tourist inflows, together with variation in the composition of alternative destinations for each country of origin of tourists, is what allows us to assign shocks to alternative destinations across provinces in Spain. In the previous subsection, we showed the variation in the composition of tourists arriving to different Spanish provinces. In this subsection, we document the variation in the alternative destinations for different countries of origin of tourists.

In Figure 1 and Appendix Table B1, we show the composition of outbound tourism for the United Kingdom, Germany, France and the United States, some of the most important countries of origin for tourism to Spain. The composition of outbound tourism varies considerably from one country to another. Although Europe as a whole is a very popular destination, the degree of popularity of each specific country varies. Furthermore, distance between origin and destination plays an important role in determining the strength of outbound tourist flows. For instance, top destinations for American tourists are neighboring Mexico and Canada, while for the European countries considered in Table B1, only Canada enters as a top 20 destination, with at most 1.4 percent of the outflow for France in 2001. As a result, any shocks that occur in Mexico or Canada will be accrued to Spain mainly through American tourists, and thus regions most dependent on American tourists (see Figure 2) will be most exposed to shocks in Mexico or Canada.

4.3. Security Shocks

To measure security shocks in alternative destinations, we create a monthly panel of countries and calculate the number of terrorist attacks with fatalities, as well as the number of victims, in each country and month. Between 2001 and 2018, there were 55 thousand incidents with victims across the world. Figure 6 (panel A) shows the evolution in the number of terrorist incidents with casualties and the number of victims worldwide. Figure 7 illustrates the number of attacks across all countries during the third quarter of 2015, highlighting that these shocks are prevalent globally. Not all shocks have the same impact on tourist flows: they only influence tourism if the affected country is a relevant destination for tourists. In Figure 8, we show the distribution of shock exposure for the province of Barcelona in the same period, illustrating the contribution of different countries. A comparison of Figures 7 and 8 reveals that only a subset of global shocks has a significant impact for Barcelona.

All in all, there are shocks (terror attacks) in every single quarter between 2000 and 2018, and every province in is exposed at least to some degree to these shocks (i.e. our *IV* from equation 4 is always non-zero). The average number of shocks a Spanish province is exposed to (by quarter) is displayed in panel B of Figure 6 (this is the quarterly average of our IV before logs). The average number of incidents that a Spanish province is exposed to during a quarter varies between 0.15 and nearly 4 over the period 2001 to 2018. Figure 9 plots the distribution of the shocks across provinces in the third quarter of 2001 and 2018, illustrating an important degree of variation in exposure to the shocks both across provinces and over time.

4.4. Sample

Our main labor market data come from the Spanish quarterly Labor Force Survey (waves 2001 to 2018). We focus on all individuals aged 16 to 65, as well as on the subsample of prime-age individuals, aged 25 to 55. Appendix Table A1 shows the descriptive statistics for both samples. About 51 percent of our sample are women, and average age is 41. About half of the people in the sample haven't finished high school, and nearly 20 percent have some university education. The participation rate is 69 percent in the overall sample and 82 percent among prime-age individuals. Finally, about 6 percent of people in the full sample are employed in a tourism-related activity. This share is 8 percent among prime-age individuals.

5. Tourism and local labor markets

5.1. Tourism and local employment (TWFE)

In Table 1, we report our fixed-effects estimates using Equation 1. The outcome variables are indicators for whether an individual was employed or looking for a job (i.e. a participation indicator), whether they were employed, and whether they worked in a tourism-related (or another) industry, as well as log usual hours of work.[27] The main regressor is the log number of tourist arrivals (in thousands) obtained from the FRONTUR dataset. We report the coefficients for the whole sample (Panel A) and prime-age individuals (25-55, Panel B). We control for individuals' demographics (age, education, gender, and immigration status), province fixed effects, and region-specific time effects.

All of the estimated coefficients are positive and strongly significant. They show that higher tourist inflows are associated with higher labor market participation in the province as well as higher employment, to a large extent tourism-related employment, but also higher employment in other sectors. Not only more people are employed in regions with higher tourist inflows, but they also work more hours.

The estimates from column 2 imply that one standard deviation increase in log tourist arrivals is associated with a 2.5 percentage-point (pp) increase in employment, i.e. a 3.5 percent increase over the average in the prime-age sample. The estimates in columns 3 and 4 further imply that about 70 percent of this association stems from an increase in tourism-related employment, while the rest comes from an increase in employment in other sectors. The pattern is generally similar in the overall and the prime-age sample. Results in column 5 imply that a 10 percent increase in tourist inflows is associated with 1 percent increase in average work hours.

These estimates cannot be interpreted causally, since there are unobserved time-varying factors that may affect both tourist inflows and employment in a province. Local investments may both attract tourists and have direct employment-generating effects. To address this potential endogeneity, we use shocks in alternative destinations that reduce tourist inflows to those destinations and lead to more tourists arriving in Spain.

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[27] Tourism-related employment includes employment in hospitality, transport (from 2008 onwards only transport of people), or leisure-related industries, such as entertainment and sports. Log hours for individuals out of work are included as zeros.

5.2. Shocks to alternative destinations and tourism to Spain (first stage)

We first document the impact of our instrument (terrorist attacks in alternative destinations) on tourist inflows to Spain, following the strategy described in Section 2.2. Using Equation 5, we regress log inflows of tourists to Spanish provinces on the shocks in the relevant alternative destinations, which we assign to each province based on equation 4.

To illustrate our first stage, we first conduct a descriptive difference-in-differences exercise focusing on the third quarter of 2015, the period with the highest number of relevant international terror attacks (see Figure 6B). Our instrument measures how affected each Spanish province was in each quarter by terrorist attacks in alternative destinations. We define an indicator for provinces more affected by the 2015q3 attacks, splitting provinces at the median value of the instrument in that quarter. Then we run a regression where the outcome is quarterly province tourist inflows, and the main explanatory variable is the indicator for more affected provinces, interacted with quarters starting in 2015q3 (we control for province, quarter, and year fixed effects). We find that tourist inflows increased by about 6 percentage points in the more affected provinces, following the 2015q3 shock (see Appendix Table A2).[28]

Our identification strategy uses all of the variation in the intensity of exposure to international terrorism shocks across provinces, as well as over time. The results of our first stage are reported in Table 2. In columns 1 and 2, we report results estimated using a quarterly province panel. In column 1, we relate terrorist incidents to the inflows in the same quarter, while in column 2 we increase the effect window to include two quarters. The estimate in column 2 becomes smaller, implying that the effect wears off after some months. In columns 3 to 6, we report our first-stage estimates using the individual-level data from the Labor Force Survey. This is equivalent to reweighting the quarterly panel using population weights, and in addition it allows us to include demographic controls, specifically age, gender, education, and immigrant status. Columns 3 and 5 report the results when using the whole sample, while in columns 4 and 6 we restrict the sample to individuals aged 25 to 55. Finally, in columns 5 and 6, following Equation 1, we include region-specific time fixed effects, thus allowing regions more exposed to tourism to be on a different time trend than those that receive fewer tourists and that may be specializing in different production sectors.

We find that shocks to alternative destinations strongly and significantly impact tourist inflows to Spanish provinces, and the impact lasts for up to two quarters. The coefficients imply

[28] In Appendix Table A3, we show that these provinces also experienced an increase in tourism-related employment in the quarters following the shock.

that a 10 percent increase in the number of shocks to competing destinations (assigned to a province) increases tourist inflows by up to 4.6 percent in the same quarter (columns 5 and 6). These estimates are highly significant, with a Wald F-statistic on the excluded instrument of 52 and 53 for specifications in columns 5 and 6, respectively.[29][30]

5.3. The impact of tourism shocks on local labor markets (2SLS)

Having established the relationship between terrorist attacks in competing destinations and tourist inflows to Spanish provinces, we next analyze the impact of tourist inflows on local labor markets in Spain. We estimate Equation 1 and instrument tourist inflows with the measure of regional exposure to terrorist attacks in the alternative destinations as in Equation 5. We report the main results in Table 3.

Our main outcomes of interest are employment, participation, and hours of work (in any sector). First, in columns 1 and 4, we report fixed effects estimates as in Table 1, for the whole sample and for the sample of prime-age individuals. Then in columns 2 and 5, we report the reduced-form estimates of the impact of province exposure to the shocks in alternative destinations. Finally, in columns 3 and 6, we report 2SLS estimates, where log tourist inflows are instrumented by the regional exposure to the shocks in alternative destinations.

Our reduced-form and 2SLS results in Table 3 suggest that tourist inflows have no significant effect on total employment or labor force participation. Our estimates are small and statistically not different from zero. We don't find that overall employment in a province reacts to increases in tourist inflows during the quarter. We do find (in panel C) that higher tourist inflows have a positive impact on hours. We estimate that a 10 percent increase in inflows leads to a 0.5 percent increase in hours of work.

In Table 4, we decompose the impact of tourism on total employment into sector-specific employment effects. We find that an exogenous increase in tourism flows driven by violence in competing destinations has a significant positive effect on employment in the tourism sector,

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[29] Even though this is lower than the threshold value of 104.67 suggested by Lee, McCrary, Moreira and Porter (2022), given the levels of significance observed in our analysis, applying their adjustment factor to the standard errors does not change our conclusions. We have also explored alternative functional forms. Using the instrument in levels instead of logs leads to an F-statistic of 11.

[30] In Appendix Table A4, we present the first-stage results for international and domestic tourist inflows separately. Our instrument has predictive power for both types of tourism, but the relationship is stronger for international tourists. A 10 percent increase in exposure to the shocks increases the inflow of international tourists by 6 percent, and the inflow of domestic tourists by nearly 4 percent. The compliers are thus disproportionately international tourists.

particularly among the prime-age population (see columns 2 and 4 of Panel A).[31] The magnitude of this effect is relatively modest, and considerably smaller than the TWFE estimate. An increase in inflows into a province of 10 percent leads to slightly less than 0.1pp higher employment in tourism for prime-age workers (or 1.2 percent over the tourism employment share). The magnitude of the estimates for the whole sample are 32 percent smaller.

Our estimates in Panels B to D show that employment in other sectors is also responsive to tourist inflows. The results in panel B suggest that employment in other services is at least as responsive to tourism as employment directly related to tourism. The magnitude of the effects is very close to what we observe in Panel A, although less precise. On the other hand, we find a significant negative impact of tourism on manufacturing employment (Panel C). Our TWFE estimates suggest a negative association between tourism and manufacturing employment, but our estimated causal impact is more than 3 times larger in magnitude. Finally, while negative, the impact on employment in the primary sector is relatively small and not significant.[32]

All in all, increases in international tourist arrivals lead to higher employment in tourism-related activities and in the services sector more broadly, but also to a significant drop in manufacturing employment. The reshuffling of employment across sectors leads to an insignificant impact on total employment and labor market participation.

We also estimate the effect of tourist inflows on wages, using administrative data from Social Security records. The results are shown in Table 5. We find that increases in tourist flows driven by terrorist attacks in alternative destinations have small negative effects on local wages. We estimate that a 10 percent increase in inflows in a quarter leads to a significant 0.5 percent reduction in average wages in the province (Panel A). Wages are unaffected in the tourism sector (Panel B), but they fall significantly in other sectors (Panel C). The overall effect is a combination of wages falling in non-tourism sectors, plus composition effects due to shifts in employment, with tourism being a relatively low-wage sector. These effects are consistent with the dynamics underlined in Beaudry et al. (2012), who show that the presence of "good jobs" enhances workers' outside options in the labor market. In our context, the wider availability of relatively low-pay tourism-related jobs may exert downward pressure on wages in other sectors.[33]

[31] Our estimates are less precise when we cluster the standard errors by province.
[32] The primary sector includes agriculture, extraction industries, and construction.
[33] We can also use Social Security data to analyze effects on employment composition by sector. Our results, shown in Appendix Table A5, indicate that higher tourist inflows lead to

5.4. Dynamic reduced-form

To illustrate our baseline results, as well as to provide support for our main specification choice, we estimate dynamic reduced-form regressions following an event-study approach. We use our instrument as the treatment variable, while the outcomes are tourist inflows (as in our first stage) as well as employment in the province (as in our reduced-form).[34]

We estimate the following equation:

$$y_{idq(t)} = \sum_{\tau=-4}^{4} \beta_\tau \widetilde{IV}^{\tau}{}_{idq(t)} + X'_{iq(t)}\gamma + \mu_d + \mu_{qt} + u_{idq(t)} \quad (8)$$

We plot the results in Figure 10 (the underlying coefficients are reported in Appendix Table A6). We first note the absence of pre-trends in tourist inflows, as well as in local employment. The timing of the shock, that is, the increase in the exposure to terrorist attacks in alternative destinations, coincides with an increase in tourist inflows across Spanish provinces in the same quarter. This effectively reflects our first stage estimates. Likewise, in the quarter of the shock, we observe an increase in tourism-related employment that all but mirrors a drop in employment in other industries, effectively leading to a zero impact on total employment.

Note that each province is exposed at least to some degree to shocks in alternative destinations in every quarter, and therefore to some "surplus" tourist inflows. Although these results suggest that the impact of the shocks are likely to be only short-term, they should not be interpreted as an analysis of the dynamics of the effect of tourism on employment. Instead,

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more employment in tourism and other services, but lower employment in manufacturing and primary sectors (consistent with our main results using Labor Force Survey data in Table 4).

[34] We follow Schmidheiny and Siegloch's (2023) strategy that allows an event-study-style analysis even without untreated periods or units. The model is estimated in quasi-differences. Exposure to the shock is binned such that the first lead and the last lag are differenced with respect to the first and last observation in the data, respectively. The rest of leads and lags are differenced with respect to the same quarter from the previous year, which allows us to capture any seasonality not accounted for by the quarter fixed effects. Equation 7 defines the (binned) treatment, i.e. the exposure to shocks in alternative destinations for each province d in quarter $q(t)$:

$$\widetilde{IV}^{\tau}{}_{idq(t)} = \begin{cases} IV_{id(q(t)+\tau)} - IV_{idq_0} & if\ \tau = -4 \\ IV_{id(q(t)+\tau)} - IV_{id(q(t)+\tau-4)} & if - 4 < \tau < 4 \\ IV_{idQ} - IV_{id(q(t)+\tau)} & if\ \tau = 4 \end{cases} \quad (7)$$

The initial period, q_0, is the first quarter of 2001, and the last period, Q, is the last quarter of 2018. The fourth lead and lag capture any potential changes in secular time effects. The first lead is used for normalization (omitted), while the rest of leads and lags show the dynamics of the effect.

we present them as supportive evidence for the validity of our identification strategy. They confirm the baseline findings documented in Tables 3 and 4, and validate our identification strategy by underlying the temporal correspondence between the shocks and the employment responses.

5.5. Robustness checks

In Table 6 and Appendix Tables A7 and A8, we report the estimates from a series of robustness checks where we test the sensitivity of our baseline results to alternative specifications of the instrument.

Weighting of incidents within a quarter: In columns 1 and 2 of Table 6, we report second-stage estimates when using alternative weighting schemes for the incidents occurring throughout the quarter. In column 1, the same weights are applied to incidents occurring each month of the quarter, while in column 2 we assign higher weights to the incidents occurring earlier in the quarter, effectively inverting the weights used in the baseline regressions.[35] The results are not at all sensitive to the use of these different weighting schemes, while the F-statistic on the excluded instruments becomes slightly lower. For this reason, we use the increasing weighting scheme as our preferred specification.

Number of victims: The GTD contains information on the number of victims that died in each terrorist attack. On the one hand, the number of victims could be used as a proxy for the salience of each attack. On the other, any terrorist attacks (especially the ones with fatalities) that occur in Europe receive a wide media coverage, therefore there may in fact be little variation in the salience driven by the number of victims. In columns 3 and 4 of Table 6, we use the log number of victims alone and in addition to the number of attacks to instrument for the inflow of tourists to Spain, respectively. The results from this specification are almost identical to the baseline results. Again, the first stage is somewhat weaker, and therefore we opt for using the log number of incidents as our main instrument.

Controlling for shares: When constructing our instrument, we use data on total tourist inflows to Spain, but we only have detailed inflow information for tourists from 21 countries of origin. Consequently, the shares used in the instrument's construction do not sum up to 1. On average, these 21 countries account for 85 percent of international inflows, though there is some variation across provinces. In provinces heavily dependent on tourism, such as the Balearic

[35] Decreasing weights, such as those in column 2, would be appropriate if there was a delay in the response to the shocks, or if the impact of the shock propagated in time. Which weighting scheme is the most relevant is an empirical question.

Islands, this share is as high as 98 percent. In contrast, provinces with large cities, such as Barcelona and Madrid, have lower shares, at 80 and 70 percent, respectively.

This variation in shares, driven by fixed province characteristics, is accounted for in our main specification indirectly through province fixed effects, while the changes in these shares are accounted for to a large degree by region-specific time effects. In column 5, we also include a control for the share of international tourism captured by our instrument, to ensure that within-province changes in these shares do not bias our results. Our main conclusions remain essentially unchanged, although standard errors are larger and the F-statistic for the excluded instrument is smaller. This is likely because much of the variation in the shares is already captured by the fixed effects.[36]

Province-level regressions: Our main regressor, the log of tourist inflows (as well as the instrument) varies at the province-quarter level. Our baseline regressions make use of individual-level data. Our approach effectively weights the province-level effects using population weights, while also allowing us to control for demographic characteristics that may influence individual employment, such as education, gender, and immigration status.

In Column 6 of Table 6, we present the results of estimating our main regressions at the province level. The outcome variables are now the province-level employment rate and the employment rate in tourism (in Panels A and C), and the log of average hours worked in a province (in Panel B). We control for the demographic composition of each provinces, such as the gender distribution, the share of high-skilled workers, the share of the immigrant population, and average age.

Consistent with our main specification, we still find a positive effect on employment in tourism (and total hours). However, in this specification the impact on total employment is estimated to be negative. As in our baseline results, we find a shift in employment from other sectors towards tourism-related activities, but the relative magnitudes are somewhat different when we do not weigh by population.

[36] In Appendix Table A9, we display the results from a specification where tourist shares are fixed at their 2000 levels. While this approach is closer to the standard shift-share strategy, it reduces our F-statistic, as it does not incorporate the growing diversification of tourists visiting Spain over time. This specification places greater weight on tourists from major European countries, such as Germany, France, and the UK. When fixing shares to their 2000 levels, we estimate similar effects of inflows on tourism-related employment, while the effect on hours increases, and the impact on total employment becomes significantly positive.

Different types of shocks: In Table A7, we examine how our LATE estimates vary based on the nature of terrorist attacks. In our baseline specification, the instrument includes all attacks with victims. In columns 1 and 2, we separate Islamic from non-Islamic terrorism, classifying attacks based on the perpetrator's identity. Attacks are considered Islamic terrorism if carried out by groups claiming to be motivated by Islamic beliefs, ideologies, or interpretations of Islam. Approximately 35 percent of incidents with victims are classified as Islamic attacks, with the remaining 65 percent categorized as non-Islamic.

Column 1 of Table A7 presents our main results using only Islamic attacks to construct the instrument, while column 2 shows results based on the instrument that excludes Islamic attacks. As indicated by the F-statistic on the excluded instrument, Islamic attacks appear to have lower predictive power for tourist inflows compared to other types of attacks (the F-statistic for the instrument based on Islamic attacks is 24, compared to 57). Tourist inflows driven by both types of incidents lead to higher employment in the tourism sector, the magnitude being larger for Islamic attacks. Neither of the two lead to significant effects on overall employment, although the sign is negative for inflows driven by Islamic terror.

In columns 3 to 5, we classify the attacks into transnational versus domestic, and construct the instrument using (alternatively) only domestic or only transnational incidents. We use two definitions of transnational attacks: one based solely on the type of target and another considering both the target and the victims' nationality.[37] Transnational attacks are a minority; using the broader definition, only 5 percent of attacks are classified as transnational. Given that most attacks are domestic, it is unsurprising that excluding transnational attacks from our instrument results in estimates close to those in the baseline specification (see columns 3 and 4 of Table A7). Column 5 shows the results when using exclusively transnational attacks. While these results align with our baseline findings, the impact on employment is weaker, and the standard errors are higher, reflecting a weaker first stage.

In column 6 of Table A7, we construct the instrument using only incidents affecting civilians. These attacks are defined by their targets, which include restaurants, hotels, retail establishments, entertainment venues, and private citizens, while excluding union

[37] An attack is considered transnational if it meets one of the following criteria: (a) the target is a diplomatic mission, NATO-related military post, airport, international NGO, hotel, or tourist; or (b) the country in which the attack occurs differs from the nationality of the victims. In the analysis, we use two instrument (alternatively)s: one that defines transnational attacks based on the type of target, and another that considers both the type of target and the nationality of the victims. In column (5) we apply the broader definition of transnational attacks.

representatives and public figures. Approximately 34 percent of the attacks are directed towards private citizens. The second-stage results indicate that tourist inflows diverted to Spain due to attacks on civilian populations have a similar impact on employment as in the baseline, though the effect on hours worked is somewhat smaller and statistically insignificant.

In columns 7 to 9, we further refine the types of attacks included in the analysis. In column 7, we exclude all attacks flagged in the GTD as possibly not being terror-related. About 17 percent of attacks carry this flag, with most suspected to be guerrilla-related incidents or other types of crime. In column 8, we omit alternative destination countries with many repeated attacks in a given year. Finally, in column 9, we exclude all attacks that took place in Spain.[38] Overall, the pattern of results remains consistent with our baseline findings.

Inflows per province population: In Table A8, we redefine our main regressor (tourist inflows) in per capita terms. Specifically, we define inflows relative to the population of the receiving province. The overall pattern of results is consistent the baseline, though the interpretation of their magnitude changes slightly. Our baseline results suggest that a 10 percent increase in tourist inflows raises tourism-related employment by 0.1 percentage points. The results in column 2 of Table A8 indicate that increasing tourist inflows by 0.10 tourists per inhabitant leads to a 0.13 percentage point increase in tourism-related employment.

5.6. Using coast length and national patrimony as an instrument

In Table 7, we show the second-stage estimates of the effect of tourism on labor market outcomes, where tourist inflows are instrumented by the interaction between geographic and cultural characteristics of the province and a time trend.[39] The main difference between this instrument and the one in our preferred specification is that, while our preferred instrument uses sudden and arguably transitory shocks, this one exploits variation in long-term trends generated by fixed province characteristics.

Results from this specification are in line with what we report in the baseline, with two notable differences. First, the positive impact on tourism-related employment is somewhat higher than in our baseline strategy. Second, the impact on employment in non-tourism-related

[38] When we exclude the shocks occurring in Spain, the F-statistic for the excluded instrument increases to 64. This aligns with the expectation that attacks in Spain would have the opposite effect on tourist inflows compared to those in alternative destinations, potentially diverting tourists away from Spain. Including the attacks that occur in Spain, however, has the benefit of accounting for incidents across all relevant destinations, with Spain itself experiencing 34 incidents during the period under study.

[39] The first stage estimates can be found in Appendix Table A10. All specifications have an F-statistic on the excluded instruments of at least 41.

sectors becomes more negative and is statistically significant in some specifications, leading to a negative overall employment effect.

This IV strategy is inspired by the one used in Faber and Gaubert (2019). Unlike our baseline strategy, it does not account for the potential effect of investment in infrastructure and development in the region and therefore the results need to be interpreted with caution. The overall conclusions do not change: higher tourist inflows generate employment in tourism-related activities, but this increase is compensated by a drop in employment in other sectors.

5.7. Channels and mechanisms

In this section, we delve deeper into heterogeneity and the mechanisms underlying our main results.

Contracts and hours of work: Table 8 shows the impact of tourist inflows on the type of contract and hours of work, overall (in tourism-related as well as other industries). In columns 1 through 4, we estimate the impact of tourism on the number of temporary and permanent contracts. Results in columns 2 and 4 show that the increase in tourism jobs was in fact driven by temporary contracts, while the drop in employment in other sectors comes from a reduction in the number of permanent contracts.

In columns 5 to 10 of Table 8, we explore the effects on the incidence of full-time and part-time jobs. Columns 6 and 8 in panel A show an increase in full-time and a decrease in part-time employment. Moreover, column 10 shows that the positive tourism shocks increased hours worked conditional on employment. A decomposition of these effects by sector in panels B and C shows that these overall patterns are explained by an increase in full-time, temporary jobs in the tourism sector, and a drop in part-time employment in other sectors. Hours of work conditional on employment go up in the tourism sector and in other sectors, as the number of part-time contracts is reduced. Thus, the number of hours worked (per worker) increases as a result of the additional tourist inflows, while the number of people in employment does not.

Heterogeneity by demographics: Table 9 show that the effects are heterogeneous by gender and education. Overall employment goes up among men (although insignificantly), driven by a stronger and positive impact on tourism-related employment and only a small negative and insignificant effect on employment in other sectors. Women also experience a positive impact on tourism-related employment, but the effect on the overall employment is (weakly) negative, again implying reshuffling of employment from other sectors towards tourism. The effect on hours of work is driven by men, whose hours increase, while the effect on hours is zero for women.

When it comes to heterogeneity by education, the positive effects on employment are concentrated among low-skilled workers. None of the effects are significant for the high-skilled, and the sign of the effects is negative for this demographic group. All in all, our heterogeneity tests show strong distributional effects of tourism across sectors and demographic groups.

Heterogeneity by initial dependence on tourism: In Table 10, we divide provinces based on their initial reliance on the tourism sector for employment, using the median employment share in tourism-related activities in the year 2000. Fixed effects regressions reveal a somewhat weaker association between tourist inflows and employment (both overall and in tourism) as well as hours worked in provinces less dependent on tourism (see columns 1 and 3). Nevertheless, all coefficients are positive and significant at conventional levels.

Our second-stage results are more challenging to interpret, as the strength of our instrument primarily comes from provinces with a high share of tourism employment. On the surface, the impact of tourist inflows on tourism-related employment appears similar across both types of provinces. However, since the instrument is weaker for less touristic provinces, these results should be interpreted with caution. In provinces more highly dependent on tourism (column 4), higher tourist inflows lead to increases in both total employment and hours worked. The impact on total employment exceeds that on tourism-related employment, indicating positive effects on both tourism and non-tourism sectors.[40] These findings suggest that, beyond sectoral spillovers, tourism may also have distributional effects across regions.

Spillovers: In Table 11, we address potential regional spillovers more directly. First, we control for tourist inflows in neighboring provinces, and then (alternatively) we control for inflows in other provinces in the same region. We calculate average tourist inflows for all provinces sharing borders with the focal province, as well as the average regional exposure to shocks in alternative destinations. With these measures, we estimate the effects of tourist inflows to both the focal and neighboring provinces, using fixed effects and two-stage least squares estimators. The results are displayed in columns 1 and 2.

The fixed effects regressions show no significant spillover effects on overall employment or hours worked, though there is a small, marginally significant effect of inflows in neighboring provinces on employment in tourism-related activities. When tourist inflows are instrumented

[40] In line with our results from Table 4, the overall positive impact on non-tourism sector masks a positive effect on employment in services and a negative effect on employment in manufacturing (results from a detailed decomposition of sector-level employment are available upon request).

by provinces' exposure to shocks, the results change. The pattern of overall employment remains unchanged (see column 2), with the main effect still zero, and the impact of inflows into neighboring provinces being negative but statistically insignificant.

Turning to hours worked, the direct impact of inflows becomes smaller, remaining positive but not statistically significant, while the spillover effect becomes negative. This suggests that, as tourist numbers rise in neighboring provinces, the number of usual hours worked in the focal province declines, hinting at a potential reshuffling of economic activity across provinces.

Regarding tourism-related employment, both the direct and spillover effects are positive and significant, although the spillover effect is estimated with less precision.

In columns 3 and 4, we estimate spillovers within (political and cultural) regions. We group provinces into regions that mostly correspond to Spain's Autonomous Communities, with exceptions for those that include a single province. These single-province communities are grouped with neighboring regions with which they share the longest borders and strongest cultural ties. For example, La Rioja is attached to Castilla y León, and Navarra is joined with the Basque Country (for further details, see the notes for Table 11).

We then calculate average tourist inflows and exposure to shocks within each region, excluding each focal province one at a time. This approach provides an alternative way of estimating spillovers, allowing us to focus on potential spillovers within regions that represent significant political and cultural divisions within Spain.

The results show no spillover effects on either overall employment or hours worked. We do find evidence of significant spillover effects in tourism-related employment, where the magnitude of the spillover effect is, in fact, larger than the direct effect.

The analysis of spillovers suggests the presence of geographic spillovers across provinces. These effects likely represent a lower bound, given that the strength of spillovers is likely a function of distance. This is because both tourist inflows and the instrument are measured at the province level, which is a relatively large geographic unit that encompasses many municipalities and multiple commuting zones. By focusing on provinces, we are already aggregating the effects of tourism inflows, which may incorporate spillovers occurring at smaller geographic scales, such as between municipalities or within commuting zones

Impact on commuting: To further explore cross-province effects, we also estimate the impact of tourist inflows on commuting between provinces. Using social security data that provides information on both the province of employment and residence for individuals, we assess the effect of tourism on cross-province commuting, conditional on employment. The results are presented in Table A11. Our findings similar in the fixed effects and 2SLS models, suggest an increase in commuting flows towards provinces experiencing higher tourist inflows.

Impact on population: Tourist inflows may lead to migration flows towards provinces experiencing increased labor demand. We test for the potential impact of tourism on provinces' (prime-age) population. To that end, we regress log population (aged 25 to 55) of a province in each quarter on tourist inflows to that province, instrumented by its exposure to shocks in alternative destinations. We use the same controls as in the baseline, excluding the demographics. Results are reported in Table A12. While our fixed-effects estimates in columns 1 and 3 suggest zero or even a negative association between tourism and population, estimates in columns 2 and 4 tell a different story. Although imprecise, they suggest that higher tourist inflows may lead to an increase in the prime-age population in a province. These effects may of course be more pronounced in response to more persistent tourism shocks.

6. Conclusions

We study the causal effect of tourism on local labor markets. We use data for Spain, one of the most popular tourist destinations worldwide, and where the tourism sector accounts for a large share of total employment, especially in some regions. We propose a novel identification strategy to address the endogeneity underlying tourist inflows and local development. We exploit shocks that affect the attractiveness of alternative tourist destinations and thus impact tourist inflows to (different regions in) Spain.

In the spirit of shift-share instruments, we assign the intensity of terrorist activity in competing destination countries across Spanish provinces. Terrorist attacks in other tourist destinations strongly and significantly increase the inflow of international tourists to Spain, and this proves to be a strong instrument that allows us to pin down the causal impact of tourism on local employment. Using this identification strategy, we show that a temporary increase in tourist inflows leads to higher tourism-related employment in the receiving region. However, higher tourist flows do not increase total employment in the local economies, because of their negative impact on employment in other sectors (especially manufacturing). These findings are confirmed across many different model and instrument specifications, including an alternative IV approach that exploits long-term increases in tourist flows. Our findings challenge the common belief that tourist inflows lead to employment creation in a region. Instead, they indicate that short-term shocks that increase tourist inflows into a region do create jobs in the tourism sector, but they also divert investment and jobs away from other sectors, without increasing total employment or wages.

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Appendix B1: Adjusting the reported arrivals of tourists by origin and destination

UNWTO data contains information on tourist flows to 196 destinations from the 21 countries of origin of tourists reported in the FRONTUR data. The number of tourists and their origin is reported by each country of destination individually, hence some differences in reporting occur. Specifically, there are eight different series reporting arrivals across destinations. These are:

TFN: Arrivals of non-resident tourists at national borders, by nationality

TFR: Arrivals of non-resident tourists at national borders, by country of residence

VFN: Arrivals of non-resident visitors at national borders, by nationality

VFR: Arrivals of non-resident visitors at national borders, by country of residence

THSN: Arrivals of non-resident tourists in hotels and similar establishments, by nationality

THSR: Arrivals of non-resident tourists in hotels and similar establishments, by country of residence

TCEN: Arrivals of non-resident tourists in all types of accommodation establishments, by nationality

TCER: Arrivals of non-resident tourists in all types of accommodation establishments, by country of residence

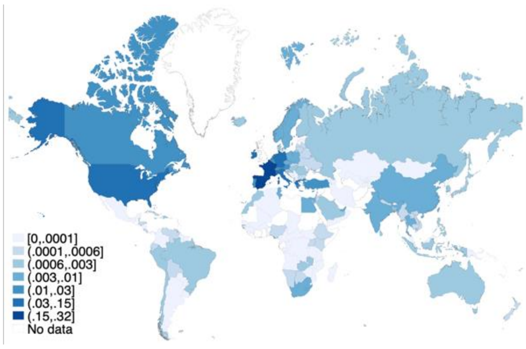
The predominant series are arrivals of non-resident tourists at national borders by nationality (TFN) or residence (TFR), about 40 percent of all reported flows are reported using one of these series. Other frequently used series are arrivals of visitors at national borders by nationality (VFN) or residence (VFR) accounting together for 24 percent of reports; and arrivals of tourists in hotels and similar establishments by country of residence (THSR) with nearly 14 percent of reports.

Some of the series are closely related, others are not, so it would be misleading calculating the shares using the mix of series. To homogenise the reported flow numbers, we exploit the fact that at least two series are reported simultaneously for 55 percent of origin-destination pairs in a given year. Therefore, we can estimate the correlations across series based on these observations. Destinations tend to report arrivals either by country of residence or nationality, so in the Appendix Table B4 below we report correlations between arrivals of tourists by residence, i.e. the most common measure, versus other series reported by residence in columns 2 to 4; in columns 5 to 7 we report correlation between arrivals of tourists by nationality versus other measures reported by nationality, and finally in column 1 we report the correlation between tourist arrivals by residence and nationality. All correlations are conditioned on origin-destination and year fixed effects.

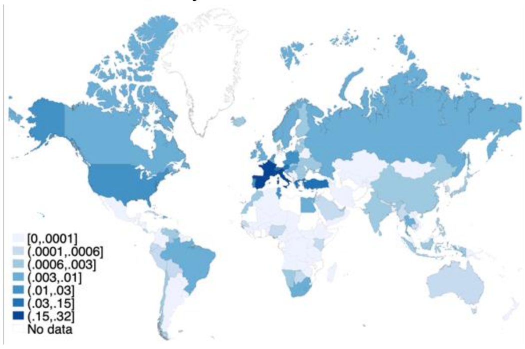
We then use the reported correlations to adjust all the reported measures to make them more comparable to arrivals of tourists by country of residence. For instance, we multiply the arrivals of tourists to the hotels by 1.125. For measures reported by nationality, we first "convert" them into arrivals of tourists by nationality and then adjust that using the correlation reported in column 1. For instance, we multiply the arrivals of tourists to the hotels by nationality by 0.9 and then by 0.966. After making these adjustments, the reported number of tourist arrivals and the adjusted series remain very close, with correlation of 98.6.

Figure 1: Outflows: Geographic Distribution of Outbound Tourism from France, Germany, the UK, and the United States (2001)

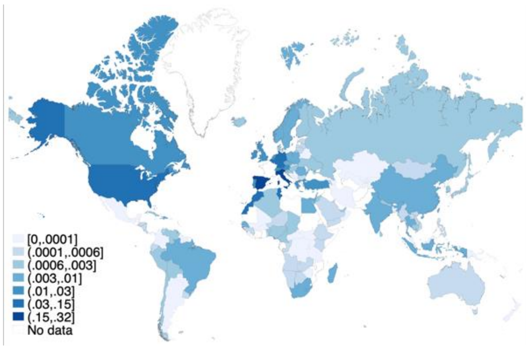
Panel A: UK



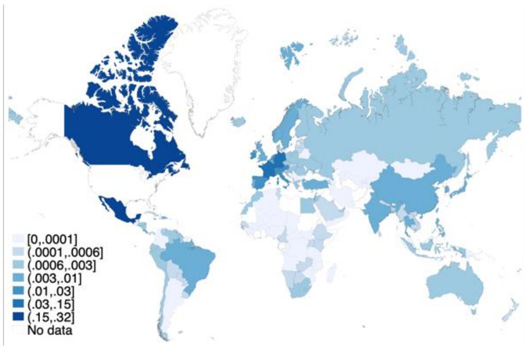
Panel B: Germany



Panel C: France



Panel D: USA

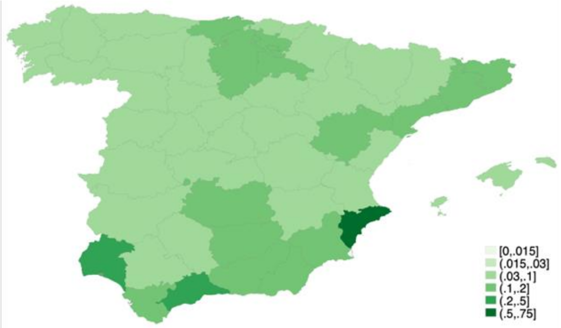


Notes: The maps depict the distribution of outbound tourism from the United Kingdom, Germany, France, and the United States in 2001, with data sourced from the UN World Tourism Organization. The regions on the maps are categorized into different percentiles—25th, 50th, 75th, 90th, 95th, and 99th—representing the varying shares of tourists traveling from these countries. Higher percentiles indicate regions with larger proportions of outbound tourism. In the following link you can find the video displaying the evolution of these shares for years 2001 to 2018.

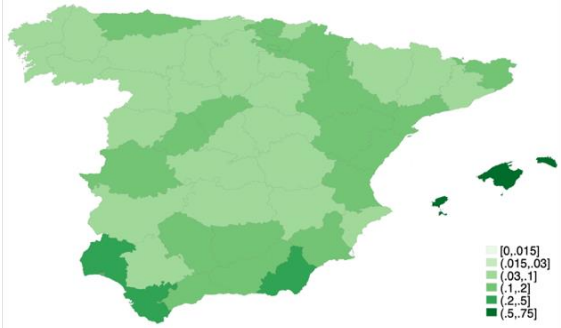
Outflow shares for UK, Germany, France and the United States, 2001-2018.

Figure 2: Inflows: Proportional Contribution of French, German, UK, and US Tourists to Total International Arrivals by Province (Q1 2001)

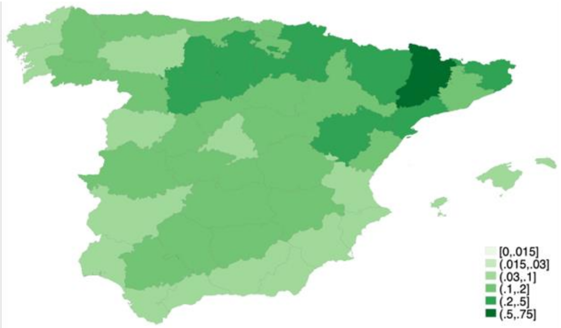
Panel A: UK



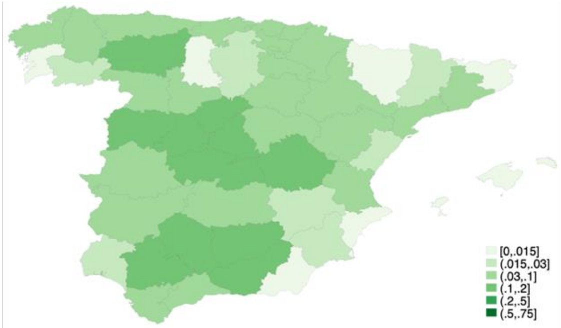
Panel B: Germany



Panel C: France



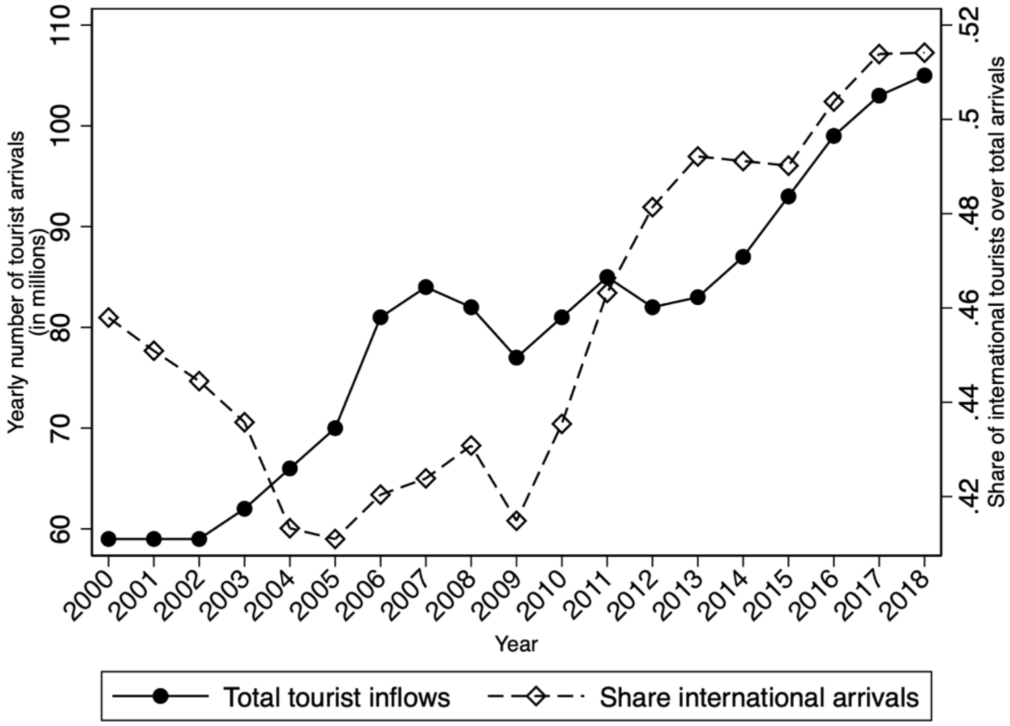
Panel D: USA



Notes: This figure depicts the percentage of international tourists from France, Germany, the United Kingdom, and the United States relative to the total international tourist arrivals in each province during the first quarter of 2001, based on Frontur data. The distribution is segmented into percentiles (25th, 50th, 75th, 90th, and 99th) to illustrate varying levels of tourist concentration from these countries. In the following link you can find the video displaying the evolution of these shares for years 2001 to 2018.

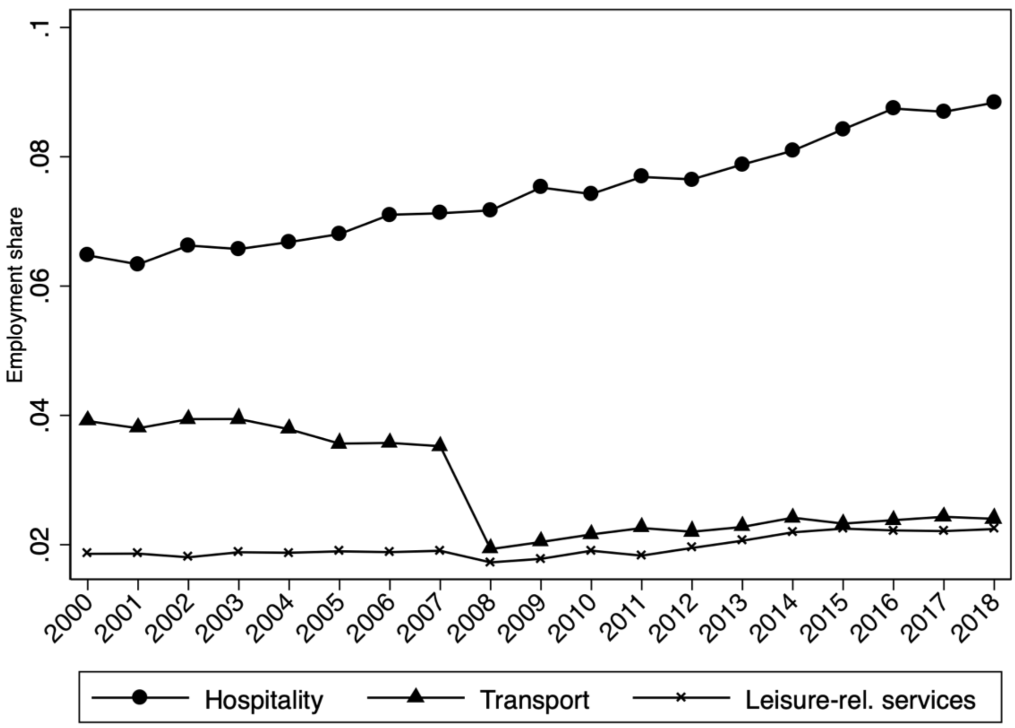
Inflow shares from UK, Germany, France and the United States, 2001-2018.

Figure 3: Total tourist arrivals between 2000 and 2018 and the share of international tourism



Notes: the figure plots the total number of tourist arrivals based on the estimates from the Frontur data. It also displays the share of international arrivals over the total.

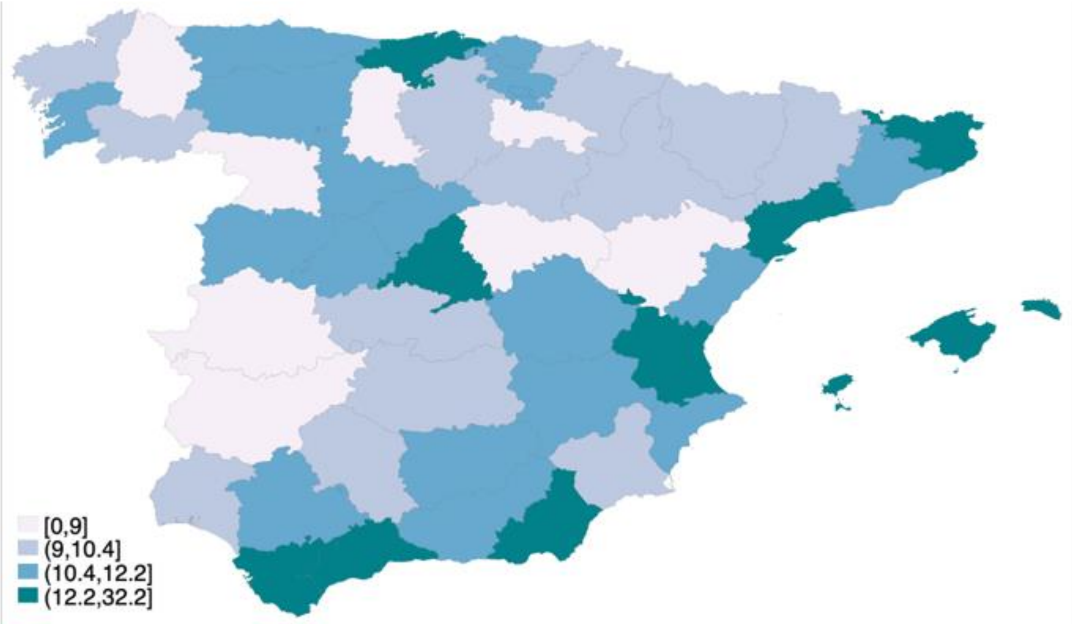
Figure 4: Employment share related to tourism activity



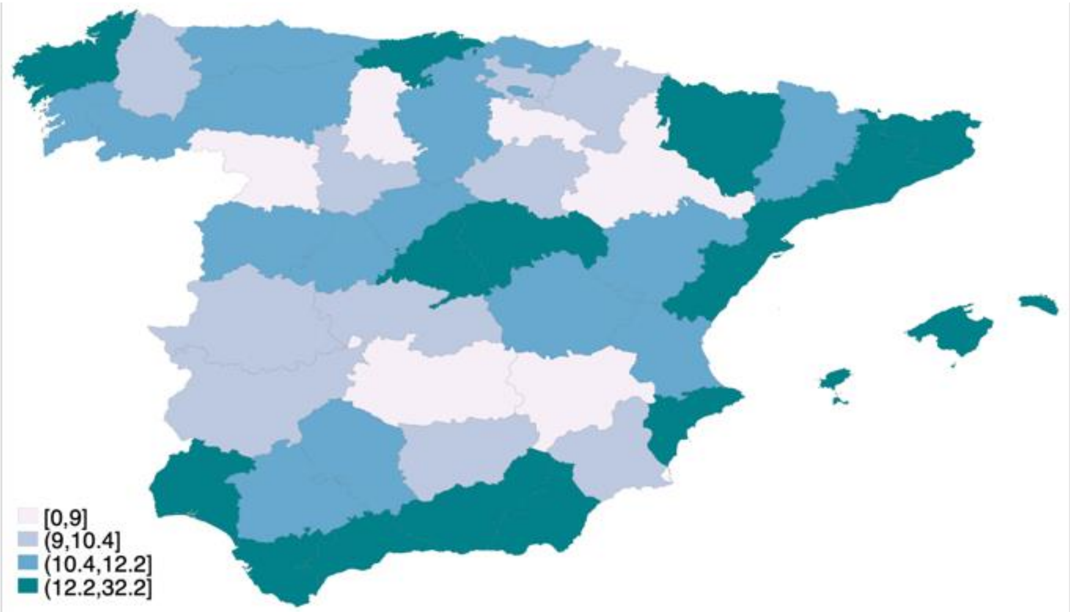
Notes: The figure illustrates the decomposition of employment shares within tourism-related activities, which include hospitality, transport, and leisure services (such as sports, culture, and entertainment). In 2008, the Labour Force Survey (LFS) reclassified the transport industry, allowing for the exclusion of goods transport from tourism-related activities. This reclassification accounts for the significant drop in the employment share within the transport component of the tourism sector.

Figure 5: Tourism employment shares across Spain (Q3 2001 and Q3 2018)

Panel A: 2001



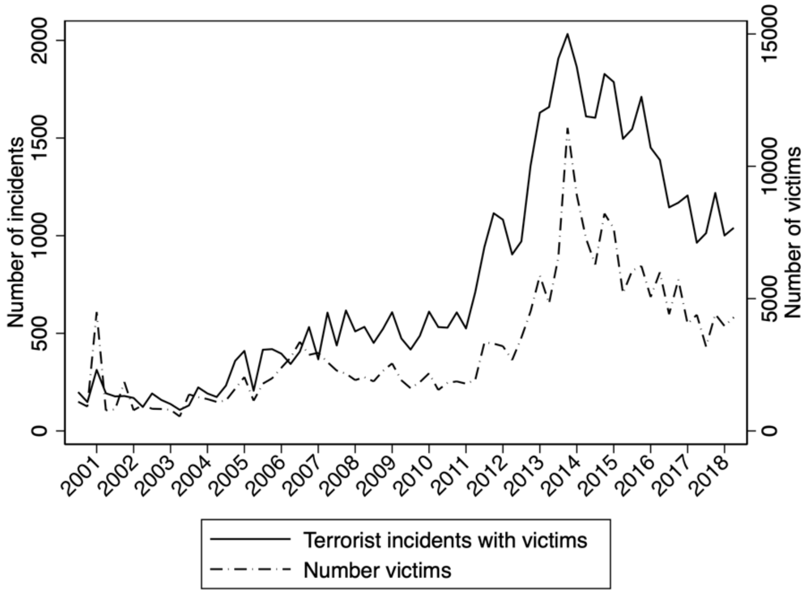
Panel B: 2018



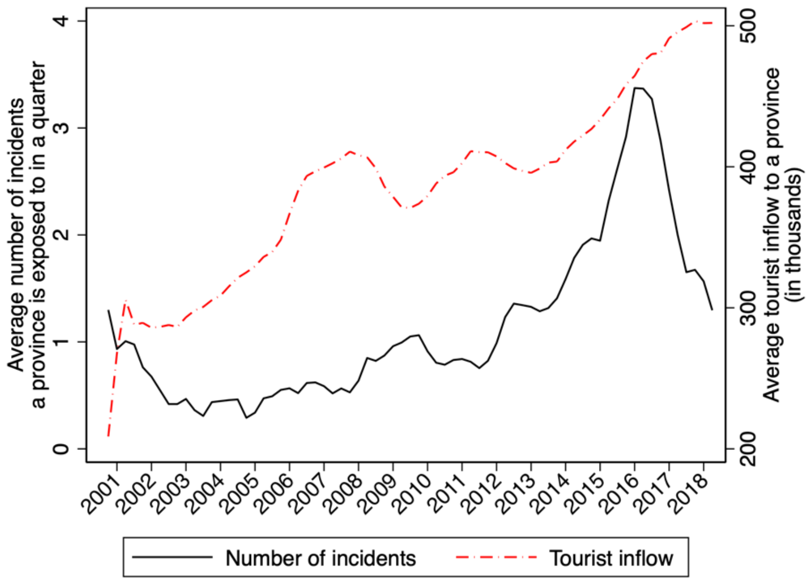
Notes: The maps depict the distribution of employment in tourism-related activities among the employed across Spanish provinces in the third quarter of 2001 and 2018. Tourism-related employment is represented as a percentage of the total employment at the provincial level. The Canary Islands are excluded from the maps.

Figure 6: Terrorism incidence and tourist inflows

Panel A: Incidence of terrorist attacks with victims 2001-2018

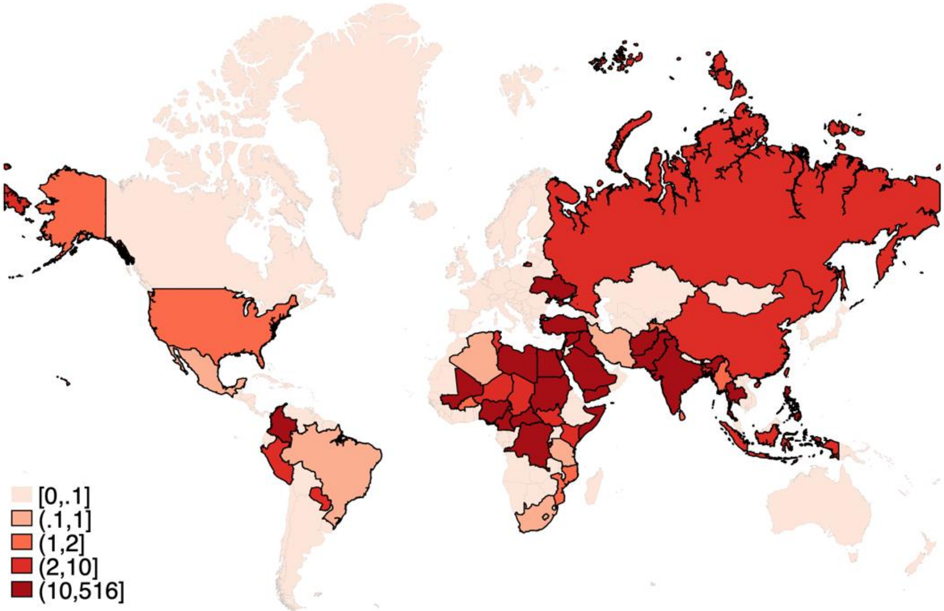


Panel B: Average number of attacks accrued to Spanish provinces in a quarter and tourist inflows



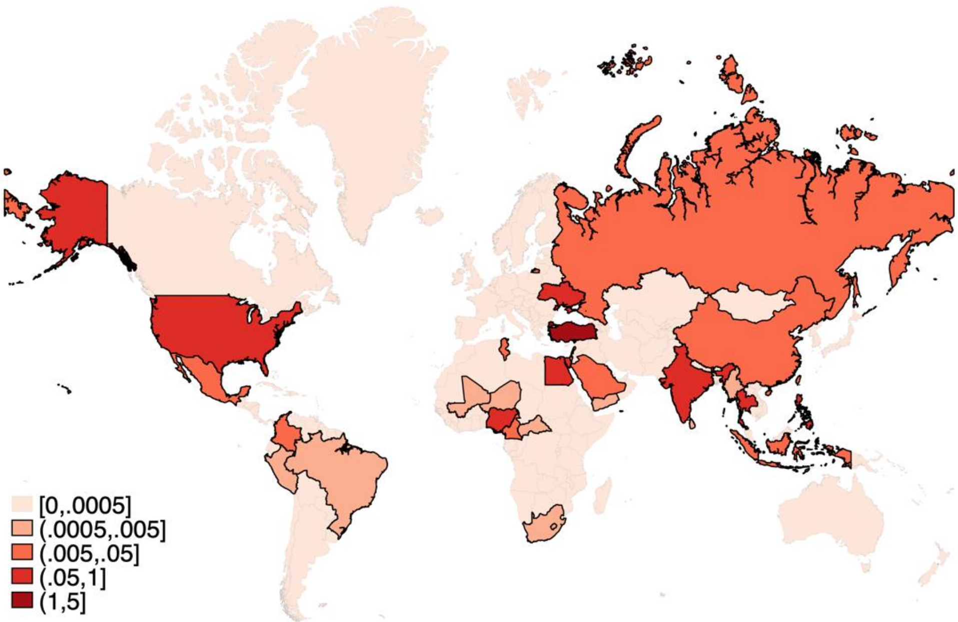
Notes: Panel A displays the quarterly number of terrorist attacks with casualties and the number of victims worldwide between 2001 and 2018. Panel B displays the average number of attacks a province is exposed to in a quarter as well as the average number of tourist arriving to a province in thousands. Both series in panel B are de-seasoned for clarity. Based on the data from the Global Terrorist Database and the estimates from the FRONTUR.

Figure 7: Geographic distribution of incidents with victims in 2015Q3



Note: This map plots the number of incidents with victims that occurred in the third quarter of 2015 in each country. Source is Global Terrorist Database.

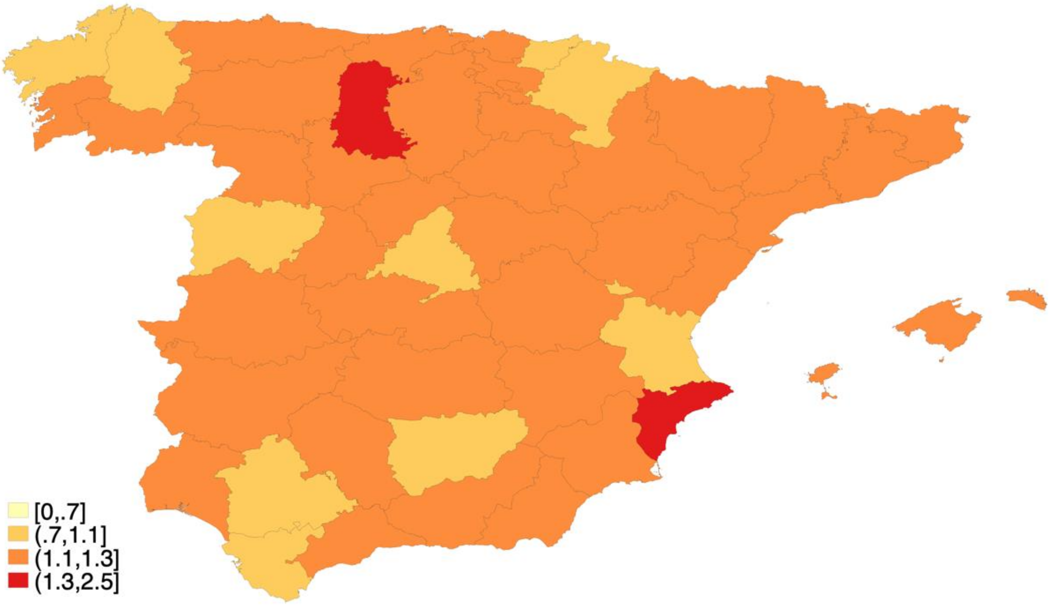
Figure 8: Terrorist attacks in alternative destinations weighted by tourist composition to Barcelona and the weight of these destinations in overall tourist outflow from each tourist origin (Q3 2015)



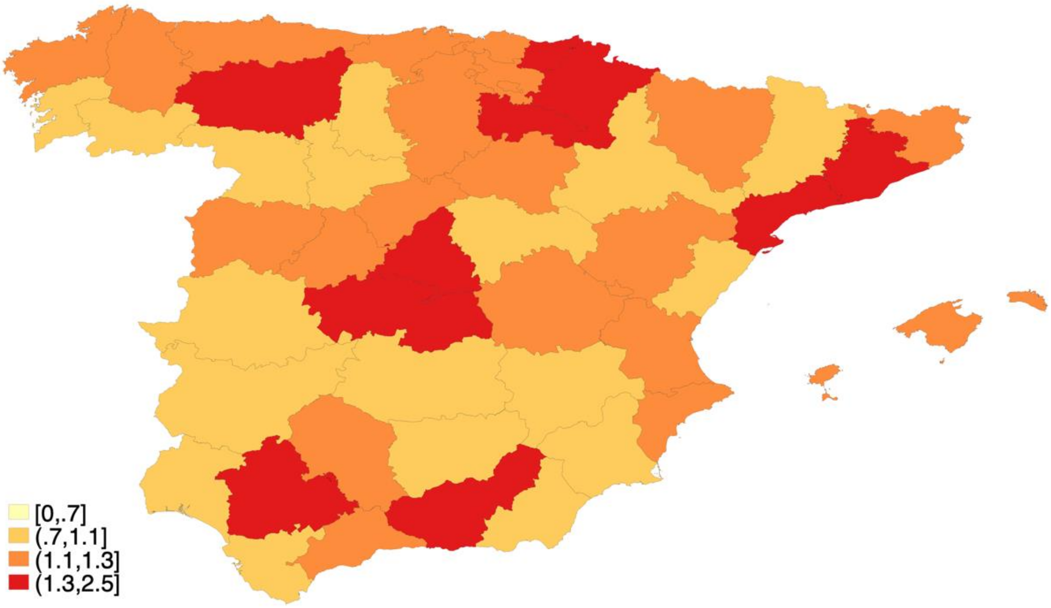
Notes: In the third quarter of 2015, Barcelona's exposure to global incidents is measured at 4.2. This map distributes that exposure across the contributing countries. The cutoffs represent the 25th, 50th, 75th, and 99th percentiles.

Figure 9: Distribution of shocks across Spain

Panel A: 2001



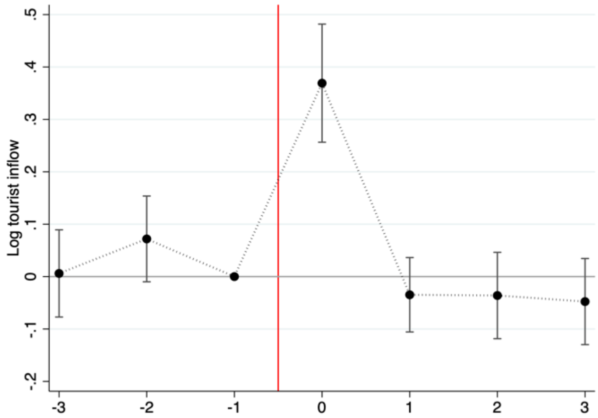
Panel B: 2018



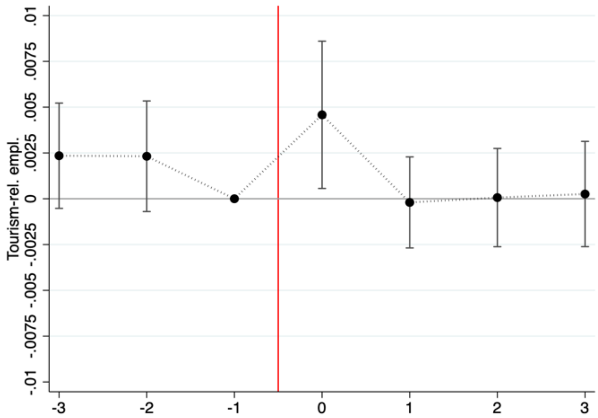
Notes: These maps illustrate the distribution of the number of shocks in competing tourist destinations to which each Spanish province is exposed during the third quarter of 2001 and 2018. The Canary Islands are excluded from the maps.

Figure 10: Dynamic effect of shocks to alternative destinations on sector-specific employment

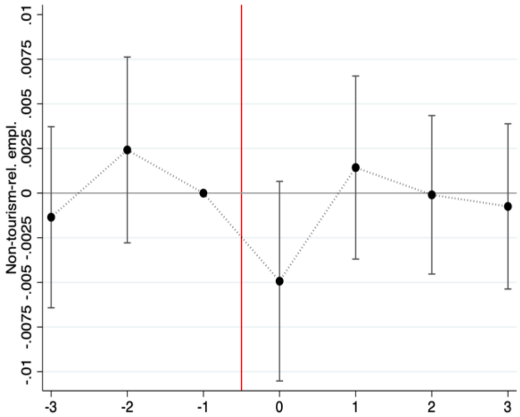
Panel A: Tourist inflows



Panel B: Tourism-related employment



Panel C: Employment in other sectors



Note: the figures display the coefficients from the first stage and the reduced form regressions of tourist inflows and employment on the log number of terrorist incidents (with casualties) occuring in competing destinations accrued to a province in a given quarter. The figures plot the point estimates and the 90% confidence intervals for prime-aged sample. The underlying coefficients are reported in the Appendix Table A2.

Table 1: Tourism and local employment, fixed effects regressions

Dep. var.	Labor market participation	Employment			Log usual hours of work
		All sectors	Tourism-related	Non-tourism related	
	(1)	(2)	(3)	(4)	(5)
Panel A: Whole sample (ages 16-65)					
Log tourism inflow	0.0134***	0.0247***	0.0170***	0.0077***	0.1018***
	(0.0008)	(0.0011)	(0.0007)	(0.0011)	(0.0033)
Avg. DV	0.69	0.58	0.07	0.51	2.00
Observations	7,891,227	7,891,227	7,891,227	7,891,227	7,891,227
Panel B: Prime-age population (25-55)					
Log tourism inflow	0.0106***	0.0241***	0.0189***	0.0053***	0.1011***
	(0.0008)	(0.0014)	(0.0008)	(0.0013)	(0.0043)
Avg. DV	0.82	0.70	0.08	0.62	2.44
Observations	5,178,218	5,178,218	5,178,218	5,178,218	5,178,218
SD Regressor	1.10	1.10	1.10	1.10	1.10
Demographics	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes
Region-quarter-year FE	yes	yes	yes	yes	yes

Notes: Table displays the coefficients from the fixed effects regressions of labour market outcomes on the log number of tourist arrivals between 2001 and 2018. The estimation is based on the data from Spanish LFS and FRONTUR data on tourist arrivals. In Panel A, the whole sample is included, in Panel B, the sample is reduced to the prime-age individuals, aged 25 to 55. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 2: The impact of exposure to terrorist incidents in alternative destinations on local arrivals

Dep.var.	Log tourist inflows					
Data level	Province-Quarterly		Individual-Quarterly			
Time horizon	Same quarter	Two quarters	Same quarter		Same quarter	
Sample			Whole	Prime age	Whole	Prime age
	(1)	(2)	(3)	(4)	(5)	(6)
Log number fatal incidents	0.2312***	0.1825***	0.3213***	0.3269***	0.4635***	0.4694***
	(0.0301)	(0.0244)	(0.0460)	(0.0463)	(0.0640)	(0.0645)
F-stat.	58.87	55.78	48.85	49.76	52.42	53.04
SD Regressor	0.79	0.79	0.77	0.77	0.77	0.77
Observations	3,736	3,684	7,891,227	5,178,218	7,891,227	5,178,218
R-squared	0.97	0.98	0.97	0.97	0.97	0.97
Province FE	yes	yes	yes	yes	yes	yes
Year-quarter FE	yes	yes	yes	yes		
Region-year-quarter FE					yes	yes
Demographic controls			yes	yes	yes	yes

Notes: table displays province- and individual-level first-stage regressions in columns 1-2 and 3-6, respectively. The F-statistic on the excluded instruments is displayed at the bottom. Result in columns 1 looks at the impact of exposure to shocks in alternative destinations on tourist inflow in the same quarter. In columns 2, we look at the impact on tourism in the same semester. In columns 3-6, we focus on the impact on inflows in the same quarter. Standard errors clustered on year-quarter level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: Impact of tourism on local labor markets

Sample	Whole sample			Prime-age sample		
Specification	FE	RF	2SLS	FE	RF	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Employment (all sectors)						
Log inflow	0.0247***		0.0061	0.0241***		0.0021
	(0.0011)		(0.0052)	(0.0014)		(0.0058)
Log number fatal incidents		0.0028			0.0010	
		(0.0026)			(0.0028)	
Avg. D.V.	0.58	0.58	0.58	0.70	0.70	0.70
Panel B: Labor market participation						
Log inflow	0.0134***		0.0053	0.0106***		0.0011
	(0.0008)		(0.0046)	(0.0008)		(0.0051)
Log number fatal incidents		0.0025			0.0005	
		(0.0023)			(0.0024)	
Avg. D.V.	0.69	0.69	0.69	0.82	0.82	0.82
Panel C: Log usual hours of work						
Log inflow	0.1018***		0.0529***	0.1011***		0.0513**
	(0.0033)		(0.0193)	(0.0043)		(0.0205)
Log number fatal incidents		0.0245**			0.0241**	
		(0.0099)			(0.0104)	
Avg. D.V.	2.00	2.00	2.00	2.44	2.44	2.44
F-stat on excluded instruments			52.42			53.04
Observations	7,891,227	7,891,227	7,891,227	5,178,218	5,178,218	5,178,218
Demographics	yes	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes	yes	yes

Notes: Table shows estimates of the impact of tourism on employment, participation and log number of hours using the least-square, reduced-form and two-stage-least-square regressions, where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations accrued to a province. In columns 1-3, the sample of all working-age population is included, while in columns 4-6 the focus is on the prime-age individuals, 25 to 55 years old. Standard deviation in log inflow is 1.10 for the overall sample as well as prime-age sample. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Decomposing the employment effects by sectors

Sample	Whole sample		Prime-age sample	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: Tourism-related employment				
Log inflow	0.0170***	0.0064**	0.0189***	0.0094**
Clustered at year-quarter level	(0.0007)	(0.0029)	(0.0008)	(0.0037)
Clustered at a province level	(0.0039)	(0.0057)	(0.0044)	(0.0064)
Avg. D.V.	0.07	0.07	0.08	0.08
Panel B: Employment in other services				
Log inflow	0.0054***	0.0108**	0.0046***	0.0094*
Clustered at year-quarter level	(0.0009)	(0.0046)	(0.0012)	(0.0052)
Clustered at a province level	(0.0023)	(0.0071)	(0.0024)	(0.0076)
Avg. D.V.	0.34	0.34	0.41	0.41
Panel C: Manufacturing employment				
Log inflow	-0.0025**	-0.0094***	-0.0036***	-0.0133***
Clustered at year-quarter level	(0.0009)	(0.0031)	(0.0011)	(0.0036)
Clustered at a province level	(0.0018)	(0.0070)	(0.0023)	(0.0082)
Avg. D.V.	0.09	0.09	0.10	0.10
Panel D: Employment in primary sectors				
Log inflow	0.0048***	-0.0016	0.0043***	-0.0035
Clustered at year-quarter level	(0.0008)	(0.0033)	(0.0009)	(0.0037)
Clustered at a province level	(0.0026)	(0.0080)	(0.0027)	(0.0085)
Avg. D.V.	0.09	0.09	0.11	0.11
F-stat on excluded instruments		52.42		53.04
Two-way clustered SE		16.47		16.64
Observations	7,891,227	7,891,227	5,178,218	5,178,218
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: table shows estimates of tourism on employment across different sectors (specifically, tourism, services, manufacturing and primary in panels A, B, C and D, respectively) using the fixed effects and two-stage-least-square regressions, where tourist inflows are instrumented by the log number of terrorist attacks in alternative destinations accrued to a province. In columns 1-2, the whole sample is included, while in columns 3-4 the focus is on the prime-age individuals, 25 to 55 years old. Standard deviation in log inflow is 1.10 for the overall sample as well as prime-age sample. Robust standard errors clustered on quarter-year level in parentheses, alternative standard errors clustered at a province level are also displayed . *** p<0.01, ** p<0.05, * p<0.1

Table 5: Impact of tourism on wages

Outcome	Log daily wage			
Sample	Whole sample		Prime-age sample	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: All sectors				
Log inflow	0.0025	-0.0473**	0.0008	-0.0467**
	(0.0039)	(0.0183)	(0.0039)	(0.0177)
Avg. D.V.	3.91	3.91	3.94	3.94
Observations	3,915,095	3,915,095	3,195,660	3,195,660
Panel B: Tourism sector				
Log inflow	-0.0063	-0.0113	-0.0068	-0.0070
	(0.0051)	(0.0120)	(0.0054)	(0.0127)
Avg. D.V.	3.81	3.81	3.83	3.83
Observations	482,633	482,633	380,899	380,899
Panel C: Other sectors				
Log inflow	-0.0020	-0.0770***	-0.0027	-0.0755***
	(0.0047)	(0.0256)	(0.0047)	(0.0249)
Avg. D.V.	3.93	3.93	3.95	3.95
Observations	2,883,937	2,883,937	2,349,731	2,349,731
F-stat on excluded instruments		54.404		54.329
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: table shows estimates of the impact of tourism on log daily wages. In columns 1-2, the sample of all working-age population is included, while in columns 3-4 the focus is on the prime-age individuals, 25 to 55 years old. In panel A, we look at the impact on all wages while in panels B and C, we look at the wages in tourism vs other industries, respectively. Standard deviation in log inflow is 1.10 for the overall sample as well as prime-age sample. Based on Spanish Social Security data. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: Robustness to alternative instrument specifications

Specification	Weight specification		Shock specification			
	Same w/n quarter	Decreasing w/n quarter	Number of victims	Number of incidents and victims	Control for shares	Collapsed at a province level
	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Employment (all sectors)						
Log inflow	0.0021	0.0025	-0.0056	0.0044	0.0093	-0.0166**
	(0.0058)	(0.0061)	(0.0090)	(0.0052)	(0.0092)	(0.0076)
Avg. D.V.	0.70	0.70	0.70	0.70	0.70	0.70
Panel B: Log hours employment						
Log inflow	0.0537**	0.0561**	0.0245	0.0593***	0.0607*	0.0348***
	(0.0207)	(0.0221)	(0.0304)	(0.0187)	(0.0328)	(0.0081)
Avg. D.V.	2.44	2.44	2.44	2.44	2.44	3.67
Panel C: Tourism-related employment						
Log inflow	0.0085**	0.0079*	0.0086	0.0097***	0.0120**	0.0116**
	(0.0039)	(0.0043)	(0.0052)	(0.0034)	(0.0056)	(0.0052)
Avg. D.V.	0.08	0.08	0.08	0.08	0.08	0.08
F-statistic on excl. IV	49.54	45.64	23.34	27.51	29.76	62.02
Observations	5,178,218	5,178,218	5,178,218	5,178,218	5,178,219	3,736
Demographics	yes	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes	yes	yes

Notes: table shows the robustness of the baseline results to the alternative instrument specifications. Results in column 1 are based on the 2SLS regressions where shocks occuring across different months within the same quarter are given the same weight. In column 2, the more recent shocks are given lower weight, the opposite to the specification used in the baseline regressions. Results in column 3 are based on the instrument specification where instead of using the number of terrorist attacks, we use the number of casualties. In column 4, the instrument exploits both number of incidents and casualties. In column 5, we control for the share of tourist flows captured by the instrument. In column 6, we show the results for the province level analysis. In panel B, the outcome variable is log of average hours usually worked within a province. The demographic controls for the province-level regression represent share of women in a province, share of immigrant population, share of high-skilled individuals as well as the average age. All the regressions are based on the sample of prime-age individuals. Standard deviation in log inflow is 1.10. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7: Local attractiveness to tourism as an alternative instrument

IV specification	Using coast instrument, linear trend	Using coast instrument, square trend	Using coast and patrimony instrument, linear trend	Using coast and patrimony instrument, square trend
	(1)	(2)	(3)	(4)
Panel A: Employment (all sectors)				
Log inflow	-0.0646	-0.0672**	-0.0247	-0.0219*
	(0.0415)	(0.0323)	(0.0160)	(0.0127)
Panel B: Log hours employment				
Log inflow	-0.3297*	-0.3879**	-0.1194*	-0.1314**
	(0.1835)	(0.1581)	(0.0654)	(0.0562)
Panel C: Tourism-related employment				
Log inflow	0.0140	0.0117	0.0093	0.0081
	(0.0095)	(0.0081)	(0.0064)	(0.0054)
F-stat on excluded instruments	60.27	54.48	41.40	77.13
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: table shows the estimates of the effect of tourism on employment, overall and across sectors when using alternative instrumental strategies. In column 1, tourist inflows are instrumented using the total length of coast and Mediterranean coast specifically interacted with a linear time trend. In column 2, the coast length is interacted with a quadratic time trend instead. In column 3, in addition to the coast length we use the count of sites classified as patrimony of humanity, all interacted with a linear trend. In column 4, we use the same instrument as in column 3, but here we interact it with a quadratic time trend. We focus on the sample of prime-age individuals. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 8a: Impact of tourism on employment characteristics

Dep.Var.	Permanent contract		Temporary contract	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: Any industry				
Log inflow	0.0107***	-0.0209***	0.0072***	0.0104*
	(0.0017)	(0.0064)	(0.0018)	(0.0060)
Avg. D.V.	0.43	0.43	0.15	0.15
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Panel B: Tourism-related industries				
Log inflow	0.0094***	0.0010	0.0075***	0.0075***
	(0.0006)	(0.0026)	(0.0006)	(0.0019)
Avg. D.V.	0.04	0.04	0.02	0.02
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Panel C: Non-tourism-related industries				
Log inflow	0.0013	-0.0219***	-0.0003	0.0029
	(0.0016)	(0.0061)	(0.0016)	(0.0052)
Avg. D.V.	0.39	0.39	0.13	0.13
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: The table presents estimates of the impact of tourism on permanent and temporary, full-time and part-time employment, as well as the logarithm of usual hours worked. The analysis uses fixed effects and two-stage least squares (2SLS) regressions, where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations affecting a province. The sample includes individuals aged 25 to 55. In Panel A, we examine the impact on employment characteristics across all industries, while Panels B and C focus on employment in tourism and non-tourism industries, respectively. Columns 9 and 10 specifically analyze hours worked conditional on employment, with Panel B concentrating on tourism-related employment and Panel C on non-tourism employment. Robust standard errors, clustered at the quarter-year level, are reported in parentheses. Significance levels are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table 8b: Impact of tourism on employment characteristics

Dep.Var.	Full-time		Part-time		Log hours work (>0)	
Specification	FE	2SLS	FE	2SLS	FE	2SLS
	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Any industry						
Log inflow	0.0214***	0.0081	0.0027***	-0.0060**	0.0264***	0.0654***
	(0.0016)	(0.0055)	(0.0006)	(0.0027)	(0.0045)	(0.0160)
Avg. D.V.	0.62	0.62	0.08	0.08	3.47	3.47
Observations	5,178,218	5,178,218	5,178,218	5,178,218	3,630,155	3,630,155
Panel B: Tourism-related industries						
Log inflow	0.0172***	0.0089***	0.0017***	0.0005	0.0431***	0.0946***
	(0.0007)	(0.0033)	(0.0003)	(0.0010)	(0.0090)	(0.0312)
Avg. D.V.	0.06	0.06	0.01	0.01	3.43	3.43
Observations	5,178,218	5,178,218	5,178,218	5,178,218	397,991	397,991
Panel C: Non-tourism-related industries						
Log inflow	0.0043***	-0.0008	0.0010*	-0.0065***	0.0230***	0.0634***
	(0.0015)	(0.0054)	(0.0006)	(0.0023)	(0.0047)	(0.0163)
Avg. D.V.	0.56	0.56	0.07	0.07	3.48	3.48
Observations	5,178,218	5,178,218	5,178,218	5,178,218	3,232,164	3,232,164
Demographics	yes	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes	yes	yes

Notes: The table presents estimates of the impact of tourism on permanent and temporary, full-time and part-time employment, as well as the logarithm of usual hours worked. The analysis uses fixed effects and two-stage least squares (2SLS) regressions, where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations affecting a province. The sample includes individuals aged 25 to 55. In Panel A, we examine the impact on employment characteristics across all industries, while Panels B and C focus on employment in tourism and non-tourism industries, respectively. Columns 9 and 10 specifically analyze hours worked conditional on employment, with Panel B concentrating on tourism-related employment and Panel C on non-tourism employment. Robust standard errors, clustered at the quarter-year level, are reported in parentheses. Significance levels are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Heterogeneity across demographic groups

Sub-sample	Men		Women		Low skilled		High skilled	
Specification	FE	2SLS	FE	2SLS	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Employment (all sectors)								
Log inflow	0.0224***	0.0080	0.0250***	-0.0074	0.0260***	0.0073	0.0134***	-0.0125
	(0.0019)	(0.0072)	(0.0016)	(0.0077)	(0.0019)	(0.0062)	(0.0019)	(0.0088)
Avg. D.V.	0.80	0.80	0.61	0.61	0.66	0.66	0.83	0.83
Panel B: Log hours employment								
Log inflow	0.1022***	0.0880***	0.0973***	0.0017	0.1072***	0.0733***	0.0599***	-0.0177
	(0.0063)	(0.0316)	(0.0059)	(0.0259)	(0.0055)	(0.0239)	(0.0080)	(0.0317)
Avg. D.V.	2.83	2.83	2.05	2.05	2.31	2.31	2.88	2.88
Panel B: Tourism-related employment								
Log inflow	0.0167***	0.0098**	0.0208***	0.0086*	0.0215***	0.0120***	0.0078***	-0.0018
	(0.0009)	(0.0045)	(0.0010)	(0.0046)	(0.0010)	(0.0043)	(0.0013)	(0.0040)
Avg. D.V.	0.09	0.09	0.07	0.07	0.08	0.08	0.05	0.05
F-stat on excluded instruments		53.14		52.93		52.88		51.45
Observations	2,539,406	2,539,406	2,638,812	2,638,812	4,008,781	4,008,781	1,169,437	1,169,437
Demographics	yes	yes	yes	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes	yes	yes	yes	yes

Notes: The table presents the heterogeneity of the baseline effects by gender and skill level using a sample of prime-age individuals. Columns 1 and 2 include only men, while columns 3 and 4 focus on women. Columns 5 and 6 analyze prime-aged low-skilled individuals, and columns 7 and 8 examine high-skilled individuals. Robust standard errors, clustered at the quarter-year level, are reported in parentheses. Significance levels are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table 10: Heterogeneity by the initial dependence on tourism employment

Subsample	Low Share of Tourism Employment in 2000		High Share of Tourism Employment in 2000	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: All employment				
Log inflow	0.0176***	-0.0970	0.0259***	0.0125**
	(0.0036)	(0.0587)	(0.0016)	(0.0055)
Avg. D.V.	0.66	0.66	0.73	0.73
Panel B: Log hours employment				
Log inflow	0.0707***	-0.0618	0.1035***	0.0483**
	(0.0116)	(0.1550)	(0.0055)	(0.0198)
Avg. D.V.	2.28	2.28	2.57	2.57
Panel B: Tourism-related employment				
Log inflow	0.0097***	0.0101	0.0217***	0.0097**
	(0.0017)	(0.0175)	(0.0009)	(0.0040)
Avg. D.V.	0.06	0.06	0.09	0.09
F-stat on excluded instruments		4.71		46.97
Observations	2,435,321	2,435,321	2,742,897	2,742,897
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: The table displays the heterogeneity in baseline effects based on the initial share of tourism-related employment in each province. Columns 1 and 2 present results for provinces with a below-median share of tourism employment in 2000, while columns 3 and 4 focus on provinces with an above-median share. Columns 1 and 3 report estimates from fixed effects regressions, and columns 2 and 4 provide results from the second-stage regressions. All regressions use the prime-aged sample (individuals aged 25 to 55). Robust standard errors, clustered at the quarter-year level, are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 11: Spillover effects of tourist inflows

Definition of neibours	Borders		Region	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: Employment (all sectors)				
Log inflow	0.0243***	-0.0029	0.0242***	0.0024
	(0.0016)	(0.0062)	(0.0013)	(0.0056)
Log inflow neighbours	0.0026	-0.0236	-0.0052	0.0047
	(0.0039)	(0.0142)	(0.0056)	(0.0222)
Panel B: Log hours employment				
Log inflow	0.1006***	0.0287	0.1015***	0.0513**
	(0.0048)	(0.0222)	(0.0042)	(0.0199)
Log inflow neighbours	-0.0061	-0.1064**	-0.0185	-0.0004
	(0.0125)	(0.0441)	(0.0177)	(0.0731)
Panel C: Tourism-related employment				
Log inflow	0.0193***	0.0129***	0.0187***	0.0122***
	(0.0008)	(0.0030)	(0.0008)	(0.0031)
Log inflow neighbours	0.0050***	0.0161*	0.0076***	0.0386***
	(0.0015)	(0.0082)	(0.0015)	(0.0105)
F-stat on excluded instruments (own)		28.17		25.27
F-stat on excluded instruments (other)		24.02		13.71
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: The table reports estimates of spillover effects of tourist inflows across provinces on employment (Panels A and C) and hours worked (Panel B) using fixed effects (columns 1 and 3) and two-stage least squares regressions (columns 2 and 4). Tourist inflows are instrumented using the log of terrorist attacks in alternative destinations assigned to each province. Spillover effects are estimated based on average inflows from neighboring provinces (columns 1 and 2) or from provinces within the same region, excluding the focal province. The instruments are similarly constructed as the average exposure to shocks in neighboring provinces or within the same region. Regions are defined as Spain's Autonomous Communities, with exceptions for single-province communities. In such cases, these provinces are aggregated with the neighboring Autonomous Community that shares the closest cultural and economic ties: Asturias is linked to Cantabria, Madrid to Castilla-La Mancha, La Rioja to Castilla y León, Navarra to the Basque Country, Murcia to Andalusia, and the Balearic Islands to Catalonia. Robust standard errors, clustered at the quarter-year level, are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1

APPENDIX A

Table A1: Socio-demographic characteristics of the LFS sample

Sample	Whole sample	Prime-age sample
	(1)	(2)
Age	41.00	40.62
	(13.80)	(8.68)
Female	0.51	0.51
High-school dropouts	0.51	0.45
High-school graduates	0.31	0.32
University education	0.18	0.23
Immigrant	0.08	0.09
Participation	0.69	0.82
Employed	0.58	0.70
Tourism-rel. employment	0.07	0.08
Services employment	0.34	0.41
Manufacturing employment	0.09	0.10
Primary sector	0.09	0.11
Permanent contract	0.34	0.43
Temporary contract	0.13	0.15
Full-time employed	0.51	0.62
Part-time employed	0.07	0.08
Log usual hours of work	2.00	2.44
	(1.81)	(1.72)
Log tourist inflow	5.78	5.79
	(1.10)	(1.10)
Log terrorist incidents	-1.21	-1.21
	(0.77)	(0.77)
Obs.	7,891,227	5,178,218
Log daily wage	3.91	3.94
	(0.54)	(0.53)
Obs.	3,915,107	3,195,666

Note: sample used in the labour market analysis comes from the Labor Force Survey years 2001 to 2018 and includes individuals aged 16 to 65 in column 1 and individuals aged 25 to 55 in column 2. Standard deviations are reported in parentheses. Wage information is based on the data from Social Security records.

Table A2: Tourist inflows to provinces most exposed to shocks in the third quarter of 2015

Dep.var.	Log tourist inflows	
Data level	Province-Quarterly	
Sample	Whole period, 2001-2018	2001-2017
	(1)	(2)
More affected provinces x Post-2015Q3	0.0592*	0.0645**
	(0.0300)	(0.0295)
Observations	3,744	3,328
Number of clusters	52	52
Number of years	18	17
Year-quarter FE	yes	yes
Province FE	yes	yes

Notes: The table presents a difference-in-difference specification, illustrating the differential increase in tourism inflows in provinces most exposed to shocks during the third quarter of 2015. The analysis is based on a province-quarter level panel. A province is considered "most affected" if its measure of exposure is above the median for the third quarter of 2015. Robust standard errors clustered at a province level . *** p<0.01, ** p<0.05, * p<0.1

Table A3: Exposure to the shocks in 2015Q3 and tourist inflows across Spanish provinces

Dep.var.	Employment in tourism industry			
Data level Sample	Full period, ages 16-65	Drop 2018, ages 16-65	Full period, ages 25-55	Drop 2018, ages 25-55
	(1)	(2)	(3)	(4)
More affected provinces x Post-2015Q3	0.00379*	0.00400*	0.00513*	0.00597**
	(0.0022)	(0.0022)	(0.0030)	(0.0030)
Observations	7,894,097	7,482,731	5,180,108	4,917,519
Number of clusters	52	52	52	52
Number of years	18	17	18	17
Year-quarter FE	yes	yes	yes	yes
Province FE	yes	yes	yes	yes

Notes: The table presents a difference-in-difference specification, illustrating the differential increase in tourism inflows in provinces most exposed to shocks during the third quarter of 2015. The analysis is based on a province-quarter level panel. A province is considered "most affected" if its measure of exposure is above the median for the third quarter of 2015. Robust standard errors clustered at a province level . *** p<0.01, ** p<0.05, * p<0.1

Table A4: First stage for dometics vs international tourist inflows

Dep.var.	Log inflows	
Sample	International	Domestic
	(1)	(2)
Log number fatal incidents	0.6281***	0.3745***
	(0.0875)	(0.0604)
F-stat.	51.58	38.40
SD Regressor	0.77	0.77
Observations	5,178,218	5,178,218
R-squared	0.97	0.97
Province FE	yes	yes
Region-year-quarter FE	yes	yes
Demographic controls	yes	yes

Notes: table displays individual-level first-stage regressions where the outcome variables are log inflow of international and domestic tourists in columns 1 and 2, respectively. The F-statistic on the excluded instruments is displayed at the bottom. Standard errors clustered on year-quarter level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A5: Decomposing the employment effects by sector, conditional on employment

Sample	Whole sample		Prime-age sample	
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Panel A: Tourism-related employment				
Log inflow	0.0443***	0.0427***	0.0418***	0.0416***
	(0.0016)	(0.0047)	(0.0016)	(0.0051)
Avg. D.V.	0.12	0.12	0.12	0.12
Panel B: Employment in other services				
Log inflow	-0.0092***	0.0219*	-0.0059*	0.0241*
	(0.0035)	(0.0131)	(0.0035)	(0.0127)
Avg. D.V.	0.67	0.67	0.67	0.67
Panel C: Manufacturing employment				
Log inflow	-0.0076***	-0.0127***	-0.0078***	-0.0142***
	(0.0012)	(0.0047)	(0.0013)	(0.0046)
Avg. D.V.	0.14	0.14	0.14	0.14
Panel D: Employment in primary sectors				
Log inflow	-0.0274***	-0.0519***	-0.0281***	-0.0515***
	(0.0021)	(0.0126)	(0.0022)	(0.0125)
Avg. D.V.	0.07	0.07	0.07	0.07
F-stat on excluded instruments		54.40		54.33
Observations	3,879,817	3,879,817	3,166,858	3,166,858
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Note: table shows estimates of tourism on employment across different sectors (specifically, tourism, services, manufacturing and primary in panels A, B, C and D, respectively) using the fixed effects and two-stage-least-square regressions, where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations accrued to a province. The results are conditional on individual employment. In columns 1-2, the whole sample is included, while in columns 3-4 the focus is on the prime-age individuals, 25 to 55 years old. Robust standard errors clustered on quarter-year level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A6: Event study, first stage and reduced form estimates

Dep. var.	Log tourist inflows	Tourism-related employment	Employment in other sectors
	(1)	(2)	(3)
Log number fatal incidents t-4	-0.0092	0.0016	0.0062
	(0.0566)	(0.0018)	(0.0037)
Log number fatal incidents t-3	0.0061	0.0023	-0.0013
	(0.0507)	(0.0018)	(0.0031)
Log number fatal incidents t-2	0.0719	0.0023	0.0024
	(0.0499)	(0.0018)	(0.0032)
Log number fatal incidents t	0.3691***	0.0046*	-0.0049
	(0.0687)	(0.0025)	(0.0034)
Log number fatal incidents t+1	-0.0347	-0.0002	0.0014
	(0.0433)	(0.0015)	(0.0031)
Log number fatal incidents t+2	-0.0361	0.0001	-0.0001
	(0.0502)	(0.0016)	(0.0027)
Log number fatal incidents t+3	-0.0477	0.0003	-0.0007
	(0.0501)	(0.0018)	(0.0028)
Log number fatal incidents t+4	0.7601***	0.0124***	-0.0091**
	(0.0804)	(0.0031)	(0.0038)
Observations	4,259,437	4,259,437	4,259,437
Demographics	yes	yes	yes
Province FE	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes

Note: table shows estimates of the dynamic effects of terrorist incidents in the alternative destinations on tourist inflows in column 1 and on the tourism-related and other employment in columns 2 and 3, respectively. The estimates are based on the prime-aged population. Standard deviation log tourist inflow is 1.10. Robust standard errors clustered on quarter-year level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A7a: Robustness to different types of incidents

Type of attack used for Instrument contruction			Excluding transnational		
	Perpetrators are Islamic groups	Non-Islamic groups	Based on target	Based on target and victim	Transnational attacks
	(1)	(2)	(3)	(4)	(5)
Panel A: Employment (all sectors)					
Log inflow	-0.0162	0.0047	0.0026	0.0022	-0.0032
	(0.0117)	(0.0055)	(0.0058)	(0.0059)	(0.0148)
Panel B: Log hours employment					
Log inflow	-0.0372	0.0643***	0.0531**	0.0530**	0.0342
	(0.0446)	(0.0194)	(0.0205)	(0.0206)	(0.0537)
Panel C: Tourism-related employment					
Log inflow	0.0235***	0.0099***	0.0099***	0.0098***	0.0179*
	(0.0056)	(0.0034)	(0.0037)	(0.0037)	(0.0098)
F-stat on excl. IV	22.54	56.68	52.64	52.71	11.95
Observations	5,178,218	5,178,218	5,178,218	5,178,218	5,178,219
Demographics	yes	yes	yes	yes	yes
Province FE	yes	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes	yes

Notes: The table presents estimates of the impact of tourism on total employment, employment in tourism-related activities, and usual hours of work, using two-stage least squares regressions where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations assigned to each province. The sample includes individuals aged 25 to 55. Column 1 includes only attacks by Islamic terrorist groups, while column 2 excludes Islamic terrorism from the instrument. Columns 3 and 4 exclude transnational incidents, whereas column 5 focuses solely on transnational incidents. Column 6 considers attacks against civilian populations, column 7 excludes incidents that might not be terror-related (likely guerrilla actions or other crimes), column 8 drops country-year observations with the highest number of attacks in a given year, and column 9 excludes attacks occurring in Spain. The standard deviation in log inflow is 1.10. Robust standard errors are clustered at the quarter-year level and reported in parentheses. Significance levels are indicated as follows: *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A7b: Robustness to different types of incidents

Type of attack used for Instrument contruction	Attacks against civilian population	Excl. attacks that are doubted to be terror-rel.	Drop 1% most affected alt. desti-nations	Excluding shocks in Spain
	(6)	(7)	(8)	(9)
Panel A: Employment (all sectors)				
Log inflow	0.0015	0.0018	0.0018	0.0025
	(0.0079)	(0.0057)	(0.0063)	(0.0062)
Panel B: Log hours employment				
Log inflow	0.0359	0.0492**	0.0504**	0.0289
	(0.0293)	(0.0208)	(0.0226)	(0.0199)
Panel C: Tourism-related employment				
Log inflow	0.0134***	0.0088**	0.0090**	0.0141***
	(0.0039)	(0.0036)	(0.0040)	(0.0035)
F-stat on excl. IV	29.20	50.19	46.06	64.00
Observations	5,178,218	5,178,218	5,178,218	5,178,218
Demographics	yes	yes	yes	yes
Province FE	yes	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes	yes

Notes: The table presents estimates of the impact of tourism on total employment, employment in tourism-related activities, and usual hours of work, using two-stage least squares regressions where tourist inflows are instrumented by the number of terrorist attacks in alternative destinations assigned to each province. The sample includes individuals aged 25 to 55. Column 1 includes only attacks by Islamic terrorist groups, while column 2 excludes Islamic terrorism from the instrument. Columns 3 and 4 exclude transnational incidents, whereas column 5 focuses solely on transnational incidents. Column 6 considers attacks against civilian populations, column 7 excludes incidents that might not be terror-related (likely guerrilla actions or other crimes), column 8 drops country-year observations with the highest number of attacks in a given year, and column 9 excludes attacks occurring in Spain. The standard deviation in log inflow is 1.10. Robust standard errors are clustered at the quarter-year level and reported in parentheses. Significance levels are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Robustness to defining tourist inflows relative local population

	FE	2SLS
	(1)	(2)
Panel A: Employment (all sectors)		
Inflow (per capita)	0.0271***	0.0029
	(0.0017)	(0.0080)
Panel B: Log hours employment		
Inflow (per capita)	0.1014***	0.0706**
	(0.0052)	(0.0283)
Panel C: Tourism-related employment		
Inflow (per capita)	0.0210***	0.0130***
	(0.0008)	(0.0047)
F-statistic on excl. IV		43.05
Observations	5,178,218	5,178,218
Demographics	yes	yes
Province FE	yes	yes
Region-Quarter-Year FE	yes	yes

Notes: The outcome variables include an indicator for employment (Panel A), the logarithm of hours worked (Panel B), and employment in tourism-related activities (Panel C). The main regressor is defined in terms of tourists per inhabitant. Robust standard errors, clustered at the quarter-year level, are reported in parentheses. Significance levels are denoted as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Robustness to fixing tourism composition to its 2000 level

Specification	Inflow and outflow shares fixed on 2000 level	Outflow shares fixed on 2000 level	Inflow shares fixed on 2000 level
	(1)	(2)	(3)
Panel A: Employment (all sectors)			
Log inflow	0.0234***	0.0042	0.0225***
	(0.0054)	(0.0060)	(0.0055)
Panel B: Log hours employment			
Log inflow	0.1137***	0.0580***	0.0924***
	(0.0224)	(0.0210)	(0.0227)
Panel C: Tourism-related employment			
Log inflow	0.0082**	0.0098**	0.0088**
	(0.0036)	(0.0038)	(0.0034)
F-stat on excluded instruments	34.87	46.24	36.84
Observations	5,180,108	5,178,218	5,180,108
Demographics	yes	yes	yes
Province FE	yes	yes	yes
Region-Quarter-Year FE	yes	yes	yes

Note: table shows estimates of tourism on employment across different sectors using two-stage-least-square regressions. The sample is includes prime-age individuals, 25 to 55 years old. In column 1, the instrument is specified using shares fixed at the year 2000 level, both for tourist inflows and outflows. In column 2, the outflow shares are fixed, but the inflow composition is allowed to vary and takes on the lagged values from the previous year. In columns 3, the outbound tourism composition is allowed to change but the composition of the inflows is fixed. Robust standard errors clustered on quarter-year level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A10: First stage alternative instrument

Dep.var.	Log tourist inflows			
IV specification	Using coast instrument, linear trend	Using coast instrument, square trend	Using coast and patrimony instrument, linear trend	Using coast and patrimony instrument, square trend
	(1)	(2)	(3)	(4)
Log coast (km) * Mediterranean * Time	-0.0028**	-0.0057	-0.0023**	-0.0044
	(0.0011)	(0.0044)	(0.0010)	(0.0042)
Log coast (km) * Time	0.0002	0.0018***	-0.0001	0.0012*
	(0.0001)	(0.0005)	(0.0002)	(0.0007)
Mediterranean * Time	0.0146***	0.0260	0.0124***	0.0202
	(0.0047)	(0.0195)	(0.0044)	(0.0183)
Patrimonio 1 * Time			0.0000	-0.0024**
			(0.0003)	(0.0011)
Patrimonio 2 * Time			-0.0010**	-0.0052***
			(0.0005)	(0.0019)
Patrimonio 3-5 * Time			0.0039***	0.0069***
			(0.0005)	(0.0019)
Log coast (km) * Mediterranean * Time sq.		0.0000		0.0000
		(0.0001)		(0.0001)
Log coast (km) * Time sq.		-0.0000***		-0.0000*
		(0.0000)		(0.0000)
Mediterranean * Time sq.		-0.0002		-0.0001
		(0.0003)		(0.0002)
Patrimonio 1 * Time sq.				0.0000**
				(0.0000)
Patrimonio 2 * Time sq.				0.0001**
				(0.0000)
Patrimonio 3-5 * Time sq.				-0.0000
				(0.0000)
F-stat.	60.27	54.48	41.40	77.13
Observations	5,178,218	5,178,218	5,178,218	5,178,218
R-squared	0.97	0.98	0.97	0.98
Province FE	yes	yes	yes	yes
Region-year-quarter FE	yes	yes	yes	yes
Demographic controls	yes	yes	yes	yes

Notes: table displays individual-level first stage regressions, where we test the strength of the alternative instrumental variable strategy as described in Section 2.3. The F-statistic on the excluded instruments is displayed at the bottom. Standard errors clustered on year-quarter level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A11: Impact of tourism on commuting

Dep. Var.	Commuting indicator	
Specification	FE	2SLS
	(1)	(2)
Log inflow province of work	0.0124***	0.0150***
	(0.0026)	(0.0056)
F-stat on excluded instruments		54.404
Observations	3,195,660	3,195,660
Demographics	yes	yes
Province FE	yes	yes
Region-Quarter-Year FE	yes	yes

Notes: we estimate the impact of tourism into a province on the probability that workers commute to work from a different province. Based on the Social Security data and a sample of prime-aged workers. Robust standard errors, clustered at the quarter-year level, are reported in parentheses. Significance levels are indicated as follows: *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Impact of tourism shocks on province's population

Dep.Var.	Log prime-age pop.			
Specification	FE	2SLS	FE	2SLS
	(1)	(2)	(3)	(4)
Log inflow	0.0006	0.0464	-0.0054*	0.0086
	(0.0035)	(0.0471)	(0.0028)	(0.0157)
Avg. D.V.	12.42	12.42	12.42	12.42
F-statistic		58.88		67.87
Observations	3,736	3,736	3,736	3,736
Demographics	no	no	no	no
Province FE	yes	yes	yes	yes
Quarter-Year FE	yes	yes		
Region-Quarter-Year FE			yes	yes

Note: table shows province-level estimates of the impact of tourism on (log) prime-age population of the province. Robust standard errors clustered on quarter-year level in parentheses. *** p<0.01, ** p<0.05, * p<0.1

APPENDIX B

Table B1: Share of tourist outflows by destination from the United Kingdom, Germany, France and the United States

United Kingdom		*Germany*		*France*		*United States*	
Panel A: 2001							
Spain	24.43	France	20.59	Spain	26.54	Mexico	29.06
France	17.57	Italy	17.93	Italy	18.42	Canada	24.29
USA	7.52	Spain	15.11	Tunisia	3.97	France	5.52
Ireland	7.07	Austria	11.54	USA	3.42	Puerto Rico	4.08
Greece	5.38	Turkey	4.06	Germany	3.37	Germany	3.26
Italy	4.18	Switzerland	3.65	Belgium	3.22	Italy	2.35
Netherlands	3.81	Greece	3.48	Andorra	3.21	Bahamas	2.04
Germany	3.34	Netherlands	2.01	Morocco	3.19	Netherlands	1.74
Cyprus	2.73	USA	1.95	Greece	2.84	Spain	1.73
Belgium	2.44	Czech Rep.	1.83	Switzerland	2.22	Switzerland	1.46
Portugal	2.09	Poland	1.48	Turkey	1.86	Jamaica	1.43
Canada	1.56	Tunisia	1.35	Netherlands	1.76	Ireland	1.29
Switzerland	1.37	Portugal	1.22	Portugal	1.66	Hong Kong	1.23
Turkey	1.22	Hungary	0.95	Martinique	1.50	Austria	1.05
Austria	1.19	Belgium	0.94	Austria	1.44	Dominican Rep.	0.96
Thailand	0.95	Croatia	0.92	Canada	1.41	Brazil	0.93
Malta	0.83	Norway	0.84	UK	1.34	China	0.82
India	0.72	Thailand	0.59	Reunion	1.28	Thailand	0.76
South Africa	0.65	Egypt	0.59	Ireland	1.09	Aruba	0.70
UAE	0.62	Sweden	0.53	Thailand	0.93	Virgin Islands	0.69
Panel B: 2010							
Spain	23.33	France	17.86	Spain	24.33	Mexico	27.92
France	11.40	Spain	13.44	Italy	14.07	Canada	17.89
Ireland	7.40	Italy	13.25	Morocco	5.31	France	4.19
USA	7.22	Austria	12.74	Germany	4.08	Puerto Rico	3.97
Italy	5.75	Turkey	6.22	Tunisia	4.02	Germany	3.60
Turkey	4.41	Switzerland	3.86	USA	4.02	Italy	3.40
Germany	3.79	Hungary	3.35	Belgium	3.26	Jamaica	1.87
Greece	3.38	Greece	3.11	Greece	2.60	Dominican Rep.	1.84
Netherlands	3.13	USA	2.63	Turkey	2.49	Spain	1.71
Portugal	2.06	Netherlands	2.56	Switzerland	2.37	China	1.67
Cyprus	1.87	Poland	1.60	Netherlands	1.96	Bahamas	1.65
Belgium	1.69	Czech Rep.	1.54	Portugal	1.83	Netherlands	1.52
Switzerland	1.55	Egypt	1.12	Austria	1.40	India	1.36
Egypt	1.51	Portugal	1.11	Thailand	1.32	Hong Kong	1.26
Thailand	1.43	Belgium	1.10	Canada	1.30	Costa Rica	1.21
India	1.38	Croatia	0.93	UK	1.30	Ireland	1.17
Canada	1.33	Thailand	0.91	Martinique	1.12	Switzerland	1.16
Austria	1.31	Sweden	0.70	Guadeloupe	1.11	Brazil	0.97

South Africa	0.85	Tunisia	0.68	Reunion	1.04	Virgin Islands	0.92
Hong Kong	0.79	Ireland	0.58	Ireland	1.03	Israel	0.91
Panel C: 2018							
Spain	25.20	Italy	15.04	Spain	25.56	Mexico	31.57
France	8.42	France	14.07	Italy	16.70	Canada	13.60
Italy	7.48	Spain	13.09	Germany	4.15	France	4.23
Ireland	6.53	Austria	12.20	Morocco	4.03	Italy	3.37
USA	6.35	Greece	5.02	USA	3.98	Germany	3.02
Greece	4.01	Turkey	4.97	Greece	3.43	Spain	2.78
Germany	3.73	Netherlands	3.89	Portugal	3.30	Puerto Rico	2.51
Netherlands	3.20	Hungary	2.64	Belgium	2.57	Dominican Rep.	2.20
Turkey	2.93	USA	2.37	Netherlands	2.07	Ireland	1.64
Portugal	2.82	Switzerland	2.25	Switzerland	1.82	Netherlands	1.56
Cyprus	1.81	Poland	1.97	Tunisia	1.71	Jamaica	1.53
UAE	1.77	Czech Rep.	1.74	Thailand	1.63	India	1.33
India	1.36	Portugal	1.61	Turkey	1.58	China	1.29
Thailand	1.30	Egypt	1.08	Canada	1.36	Bahamas	1.23
Austria	1.24	Thailand	1.00	Ireland	1.18	Costa Rica	1.16
Belgium	1.16	Croatia	0.99	Austria	1.11	Switzerland	1.12
Switzerland	1.11	Belgium	0.94	Andorra	1.09	Greece	1.03
Canada	1.08	Ireland	0.88	UK	1.00	Thailand	1.03
Hungary	1.04	Bulgaria	0.73	Reunion	0.96	Philippines	0.97
Malta	0.87	UAE	0.72	UAE	0.88	Portugal	0.88

Notes: The table displays the composition of outbound tourist flows in 2001, 2010, and 2018 from the UK, Germany, France, Italy, and the USA. Only the 20 destinations with the largest tourist inflows are shown. The data is sourced from the UNWTO outbound tourism series.

Table B2: Tourist inflow composition to provinces of Barcelona, Balearic Islands, Madrid and Málaga

2001		*2010*		*2018*	
		Panel A: Barcelona			
United Kingdom	14.48	Italy	12.17	France	13.92
Italy	11.56	France	11.95	United Kingdom	12.53
France	9.97	United Kingdom	11.18	United States	10.11
United States	8.94	United States	8.22	Italy	9.85
Germany	7.75	Germany	7.77	Germany	9.65
Japan	7.22	Japan	3.80	Netherlands	3.70
Netherlands	3.90	Netherlands	3.53	Russia	3.39
Portugal	2.74	Sweden	2.36	Japan	3.05
Switzerland	2.59	Portugal	2.32	Belgium	2.61
Belgium	2.45	Belgium	1.85	Switzerland	2.45
Sweden	1.53	Switzerland	1.83	Portugal	2.38
Norway	1.37	Ireland	1.69	Sweden	1.92
Greece	1.24	Russia	1.69	Poland	1.53
Ireland	1.07	Denmark	1.33	Denmark	1.36
Austria	0.88	Greece	1.31	Ireland	1.32
Finland	0.87	Austria	1.26	Austria	1.08
Denmark	0.84	Finland	1.18	Norway	0.99
Russia	0.70	Norway	1.17	Finland	0.97
Poland	0.38	Poland	0.79	Greece	0.60
Czech Republic	0.24	Czech Republic	0.32	Czech Republic	0.49
Luxembourg	0.13	Luxembourg	0.13	Luxembourg	0.14
		Panel B: Madrid			
United States	15.30	Italy	12.06	United States	11.61
United Kingdom	11.72	United States	10.37	France	9.08
France	7.74	France	8.25	United Kingdom	8.93
Italy	7.44	United Kingdom	8.09	Italy	8.91
Japan	6.76	Portugal	6.00	Germany	6.50
Germany	5.58	Germany	5.99	Portugal	6.07
Portugal	5.05	Japan	3.57	Netherlands	3.29
Netherlands	2.18	Netherlands	2.70	Japan	2.49
Belgium	1.66	Belgium	1.59	Russia	2.01
Sweden	0.94	Russia	1.50	Switzerland	1.93
Switzerland	0.89	Ireland	1.43	Belgium	1.80
Austria	0.72	Switzerland	1.13	Ireland	1.22
Greece	0.63	Greece	1.12	Poland	1.20
Ireland	0.60	Sweden	0.91	Sweden	1.10
Russia	0.59	Austria	0.90	Denmark	0.95
Norway	0.51	Denmark	0.86	Austria	0.84
Denmark	0.50	Poland	0.72	Finland	0.68
Poland	0.47	Finland	0.71	Norway	0.61
Finland	0.39	Norway	0.64	Greece	0.53

Czech Republic	0.15	Czech Republic	0.32	Czech Republic	0.34
Luxembourg	0.15	Luxembourg	0.12	Luxembourg	0.13

Panel C: Balearic Islands

Germany	61.44	Germany	73.50	Germany	56.53
United Kingdom	19.98	United Kingdom	10.61	United Kingdom	15.18
France	3.19	Austria	2.60	Switzerland	2.99
Italy	2.68	Switzerland	1.56	Sweden	2.93
Switzerland	2.04	France	1.56	France	2.79
Sweden	1.40	Sweden	1.05	Italy	2.12
Belgium	1.18	Netherlands	0.97	Austria	2.00
United States	0.92	Denmark	0.90	Netherlands	1.94
Netherlands	0.87	Italy	0.87	Denmark	1.86
Austria	0.80	United States	0.84	United States	1.28
Denmark	0.80	Norway	0.36	Norway	1.25
Luxembourg	0.63	Belgium	0.35	Belgium	1.24
Czech Republic	0.47	Russia	0.32	Poland	0.99
Finland	0.31	Portugal	0.32	Finland	0.79
Russia	0.25	Ireland	0.21	Russia	0.76
Japan	0.16	Luxembourg	0.18	Portugal	0.56
Norway	0.14	Czech Republic	0.16	Ireland	0.43
Portugal	0.09	Poland	0.15	Japan	0.38
Ireland	0.06	Japan	0.14	Luxembourg	0.26
Poland	0.04	Finland	0.09	Czech Republic	0.21
Greece	0.04	Greece	0.06	Greece	0.08

Panel D: Alicante

United Kingdom	62.29	United Kingdom	53.68	United Kingdom	52.64
Belgium	5.41	Belgium	5.94	Netherlands	6.18
Netherlands	5.27	Germany	5.13	Belgium	6.02
Germany	5.16	Netherlands	4.50	France	4.21
France	4.51	France	3.89	Germany	3.99
Italy	2.64	Portugal	3.22	Norway	3.07
Norway	1.24	Italy	2.71	Sweden	2.80
United States	1.18	Norway	1.85	Italy	2.76
Russia	0.87	Ireland	1.82	Ireland	1.79
Portugal	0.82	Sweden	1.14	Russia	1.41
Switzerland	0.74	United States	0.99	Switzerland	1.32
Sweden	0.65	Russia	0.98	Finland	1.26
Ireland	0.56	Switzerland	0.91	Denmark	1.19
Denmark	0.33	Poland	0.71	United States	1.07
Greece	0.26	Denmark	0.64	Poland	1.02
Poland	0.26	Finland	0.53	Portugal	0.85
Finland	0.25	Austria	0.37	Austria	0.27

Japan	0.19	Czech Republic	0.18	Czech Republic	0.24
Austria	0.13	Greece	0.15	Japan	0.12
Czech Republic	0.13	Japan	0.14	Greece	0.09
Luxembourg	0.05	Luxembourg	0.06	Luxembourg	0.08

Notes: The table displays the composition of international tourist inflows during the first quarter of 2001, 2010, and 2018 for four destination provinces: Barcelona, Madrid, the Balearic Islands, and Alicante. Data is sourced from FRONTUR.

Table B3: International tourist arrivals to Spain by origin

2001		*2009*		*2018*	
Germany	22.35	United Kingdom	20.07	United Kingdom	18.82
United Kingdom	22.34	Germany	19.03	Germany	14.07
France	9.78	France	10.92	France	10.90
Italy	6.25	Italy	6.99	United States	5.47
United States	5.92	United States	4.79	Italy	5.46
Netherlands	3.69	Netherlands	3.98	Netherlands	3.89
Belgium	3.37	Portugal	3.52	Portugal	2.80
Portugal	3.33	Belgium	2.97	Belgium	2.57
Japan	2.14	Sweden	1.74	Sweden	2.22
Switzerland	1.79	Ireland	1.72	Switzerland	1.83
Sweden	1.69	Switzerland	1.62	Russia	1.77
Russia	0.98	Japan	1.60	Ireland	1.74
Norway	0.86	Russia	1.35	Poland	1.66
Ireland	0.83	Denmark	1.15	Denmark	1.23
Denmark	0.70	Norway	1.00	Norway	1.21
Austria	0.69	Poland	0.97	Japan	1.01
Poland	0.60	Austria	0.87	Austria	0.89
Czech Republic	0.52	Finland	0.73	Finland	0.80
Finland	0.51	Czech Republic	0.52	Czech Republic	0.50
Greece	0.29	Greece	0.40	Greece	0.25
Luxembourg	0.24	Luxembourg	0.20	Luxembourg	0.16
Cumulative	88.86		86.13		79.22

Note: The table displays the compostion of international tourist inflows in 2001, 2009 and 2018. The table displays the 21 countries with highest tourist inflows to Spain covered by the FRONTUR data on international arrivals to Spain.

Table B4: Conditinal correlations across reported tourist inflows

D.V.	Arrivals of tourists by country of residence				Arrivals of tourists by nationality		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Arrivals of tourists by nat.	0.966***						
	(0.001)						
Arrivals of visitors by res.		0.121***					
		(0.001)					
Arrivals tourists to hotels by res.			1.125***				
			(0.026)				
Arrivals tourists to all accommodation by res.				0.848***			
				(0.019)			
Arrivals of visitors by nat.					0.573***		
					(0.137)		
Arrivals tourists to hotels by nat.						0.900***	
						(0.099)	
Arrivals tourists to all accommodation by nat.							0.771***
							(0.098)
R-squared	0.99	0.99	0.98	0.99	0.98	0.97	0.97
Observations	1,248	1,992	2,930	1,960	2,701	2,663	1,233
Origin-Destination FE	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes

Notes: Standard errors clustered on destination country level in parentheses. World Tourism Organization data.
*** p<0.01, ** p<0.05, * p<0.1

Table B5: Tourism-related employment shares across provinces

Year	2001		2018	
	Rank	Employment share	Rank	Employment share
Balearic Islands	1	24.19	2	27.37
Las Palmas	2	21.33	1	31.22
Málaga	3	17.22	4	19.79
Girona	4	16.68	6	16.26
Tarragona	5	13.47	8	14.54
Cantabria	6	13.18	11	12.42
Madrid	7	12.97	9	13.14
Granada	8	12.19	13	12.32
Sevilla	9	12.05	23	11.18
Alicante	10	12.03	7	16.17
Asturias	11	11.69	20	11.32
Ávila	12	11.59	21	11.27
Cádiz	13	11.58	5	17.66
Salamanca	14	11.40	27	10.80
Huesca	15	11.40	12	12.34
Almería	16	11.40	24	11.10
Vizcaya	17	11.19	31	10.17
Burgos	18	11.17	28	10.50
Valencia	19	11.01	14	11.84
Barcelona	20	10.95	10	13.03
Valladolid	21	10.39	35	9.76
Pontevedra	22	10.38	22	11.25
Castellón	23	10.36	18	11.37
Guipúzcoa	24	10.30	17	11.60
Albacete	25	10.19	47	8.26
Álava	26	10.17	39	9.30
León	27	10.12	29	10.36
Cuenca	28	10.11	37	9.60
Navarra	29	9.91	38	9.57
Zaragoza	30	9.86	33	9.83
Segovia	31	9.83	15	11.69
Murcia	32	9.57	40	9.25
Cáceres	33	9.53	42	9.20
Palencia	34	9.51	41	9.24
A Coruña	35	9.40	19	11.36
Jaén	36	9.39	45	8.55
Toledo	37	9.31	43	9.05
La Rioja	38	9.26	50	7.68
Ciudad Real	39	9.11	49	7.97
Córdoba	40	8.90	25	11.10

Lleida	41	8.85	32	10.00
Ourense	42	8.73	26	10.84
Huelva	43	8.57	36	9.61
Guadalajara	44	8.54	3	19.90
Soria	45	8.54	46	8.35
Teruel	46	8.30	16	11.62
Lugo	47	8.28	34	9.76
Zamora	48	7.78	48	8.03
Badajoz	49	7.75	44	8.99
Melilla	50	7.18	51	7.63
Ceuta	51	7.08	30	10.22
Average		10.86		11.87
SD		(3.16)		(4.51)
Min		7.08		7.63
Max		24.19		31.22

Note: the table displays province-level employment shares in tourism-related activities, which include hospitality, transport and entertainment and culture industries. The employment share is computed over the total number of people employed in each year and province. The data source is the Spanish Labor Force Survey (LFS). The shares were computed using sampling weights from the survey.