

Preference shifts during health shocks: Foreign tourists' expenditure–price elasticity throughout the pandemic

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Abstract:

This study evaluates the changes in the expenditure–price elasticities of foreign tourists in the summer periods of 2019, 2020 and 2021. We first develop a theoretical characterization that combines microeconomic, loss aversion, price inequality and precautionary savings theories. Next, exploiting microdata for more than 34,000 foreign tourists visiting Spain, we estimate OLS and quantile regressions to empirically examine the expenditure elasticities with respect to the prices of transport services, leisure activities and bars and restaurants at the destination (17 regions). We find that (i) the expenditure–price elasticity of transportation (leisure activities) increases (decreases) during the pandemic, whereas that of bars and restaurants remains unchanged, (ii) foreign tourists are comparatively less expenditure–price elastic at high expenditure levels in transportation and bars and restaurants, and (iii) expenditure–price elasticities are highly heterogeneous depending on the origin country. Managerial and theoretical implications of the findings for firms' pricing strategies are discussed.

Keywords: *expenditure elasticity; price variations; foreign tourists; preference shifts; COVID-19*

Cite as:

Boto-García, D. and Baños-Pino, J.F. (2023). Preference shifts during health shocks: Foreign tourists' expenditure–price elasticity throughout the pandemic. *Journal of Travel Research*, OnlineFirst. <https://doi.org/10.1177/00472875231170223>

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1. INTRODUCTION

The COVID-19 disease outbreak has produced a large drop in tourism demand worldwide. Apart from travel restrictions that have reduced transportation supply, tourists have exhibited a lower willingness to travel because of the different preventative actions needed for safe travel. Perceived health risks, negative affect and threat salience have caused strong negative emotional reactions to travel abroad (Chua et al., 2021), particularly to destinations with high infectious cases (Li et al., 2021). In this regard, recent evidence points to important shifts in travel patterns, such as a switch toward domestic tourism (Boto-García & Leoni, 2021), avoidance of crowded accommodations (Park et al., 2021), drops in social interactions at the destination (Li et al., 2020) or greater preference for variety seeking (Kim et al., 2022), among others.

The drop in international tourists has resulted in important economic losses for tourism and hospitality firms, particularly in countries specializing in the tourism sector, such as Italy and Spain (Minondo, 2021). The changes in tourism demand have led to important price variations as a result, which have been heterogeneous across tourism goods. However, without a proper understanding of tourists' responses to pricing strategies during a disease outbreak, tourism firms and regional authorities might not be aware of the impact of such price changes on their business performance. Indeed, experts consider investigating the changes in consumer behavior produced by COVID-19 a relevant research question (Assaf et al., 2022).

Equity theory posits that people develop negative emotional responses when they perceive they are paying more than a comparable reference party (Xia et al., 2004). Price unfairness typically results in lower firm profits due to reduced purchase intention and consumer dissatisfaction (Kahneman et al., 1986). In this regard, Zhang et al. (2020) document that people have developed negative emotional responses to price differential practices between themselves and others during the COVID-19 outbreak. Similarly, the precautionary savings motive during economic downturns might produce a lower propensity to consume (Kimball, 1990), which might translate into greater price sensitivity, particularly for the case of nonessential goods such as tourism (Kamakura & Du, 2012). As a result, we could expect tourists to become more price elastic during the pandemic, which translates into lower expenditure–price elasticity. An opposite view rooted in recent advances in loss aversion theories (Koszegi & Rabin, 2006; 2007; Sprenger, 2015) postulates that the new context might induce people to become less risk-

averse, thereby producing present bias and a greater temptation to overconsume (Laibson, 1997). Beyond this, preference changes might alter indifference curves. In a recent study, Kim et al. (2021) show that the pandemic has increased tourists' preference for more expensive options, probably through prices-as-quality-signals mechanism. To guarantee health safety, travelers have become less price sensitive and more willing to pay high prices to guarantee certain quality standards (Rao, 2005). From this viewpoint, expenditure–price elasticity is predicted to increase during COVID-19. Overall, it is unclear how tourists react to price variations during health shocks.

Little is known about changes in tourists' expenditure at their destination for those who continue traveling during the pandemic. In this vein, a close examination of the behavior of resilient segments, conceptualized as crisis-resistant tourists that exhibit a strong taste for tourism and continue travelling during health or economic crises, is key for the recovery of the industry. This research studies the changes in foreign tourists' expenditure–price elasticities caused by COVID-19. We evaluate tourists' consumption reactions to price variations in transport services, leisure activities and bars and restaurants at their destination before (summer of 2019) and at two different moments of the pandemic (summer periods of 2020 and 2021). We provide both a theoretical characterization and an empirical analysis using data for foreign tourists visiting Spain.

The work has two distinctive contributions to the tourism literature. From an empirical perspective, the paper adds to a large body of research that estimates expenditure equations to uncover tourists' changes in consumption during economic downturns (Alegre & Pou, 2016; Alegre et al., 2013; Bernini et al., 2020; Strale, 2021). In the COVID-19 context, a growing body of literature has examined the effects of the pandemic on different outcomes, including travel destination choices (Li et al., 2021), the distance traveled (Boto-García & Leoni, 2021), the type of activities to perform at the destination (Ren et al., 2022) and hotel demand resilience (Boto-García & Mayor, 2022), among others. However, studies on potential expenditure shifts are scarcer. We expand the literature by studying for the first time the elasticity of foreign tourists' expenditure with respect to regional prices in three major tourism services, both before and during the pandemic. This is highly relevant, as it informs about how pricing decisions in three of the most relevant industries affect the economic contribution of tourism to regional areas during shocks.

The second contribution is that the paper provides a theoretical characterization of potential shifts in expenditure elasticity during health shocks. A standard microeconomic characterization of an expenditure function is combined with price inequality (Kahneman et al., 1986), precautionary savings (Kimball, 1990), reference-dependent preferences (Koszegi & Rabin, 2006; 2007) and prices as quality cues (Rao, 2005) theories. Our model postulates that faced with a shock, consumers react heterogeneously and might change their tourism basket composition. Understanding the sign and magnitude of the change in their consumption choices has profound economic implications from a theoretical viewpoint. We argue that the sign and magnitude of expenditure–price elasticity with respect to each category is undetermined a priori and depends on potential preference changes that alter the shapes of indifference curves and individual demands as a result. In light of our findings, we discuss theoretical and managerial implications for tourist firms’ pricing strategies under loss aversion based on the theoretical developments by Heidhues & Koszegi (2008).

2. LITERATURE REVIEW

2.1. Tourists’ expenditure patterns

A large body of literature has studied tourists’ expenditure patterns, both at the aggregate (Álvarez-Díaz et al., 2015; Bernini et al., 2020; Gunter & Smeral, 2016; Papatheodorou, 1999; Rosselló-Nadal & He, 2020) and individual levels (Lin et al., 2021; Strale, 2021; Zheng & Zhang, 2013). A review of the state of the art from a microeconomic viewpoint is presented in Wang and Davidson (2010). A meta-analysis that summarizes existing evidence can be found in Peng et al. (2015).

Some stylized findings of this stream of research are the following. First, tourist expenditure is highly sensitive to relative price levels. Although expenditure–price elasticities are around the unit (Martins et al., 2017), there is notable variability depending on the country being analyzed (Álvarez-Díaz et al., 2015; Papatheodorou, 1999). In this regard, differences in cultural traits, economic development and traveling habits make price sensitivity to vary by source market (Crouch, 1996; Peng et al., 2015). Second, income elasticities have decreased over time, with tourism currently considered more as a necessity rather than a luxury good (Gunter & Smeral, 2016; Lin et al., 2021). Third, sociodemographic characteristics such as age, household size, nationality, educational level or occupation explain a substantial part of the cross-sectional

variability in tourist expenditure (Wang & Davidson, 2010). This is the result of the sociodemographic profile being generally considered a crude proxy of underlying preferences in the spirit of Pollak and Wales (1981).

Fourth, the roles of personal characteristics, income and prices on expenditure notably vary across expenditure categories (Hong et al., 1996; Zheng & Zhang, 2013). In this respect, Fleissig (2021) shows that air transportation has a highly elastic demand, while food and beverages have an inelastic demand. This author also reports that increases in the price of air transportation would induce more substitution into other transportation-related commodities than the reversal. Moreover, price surges in accommodations reduce food expenditures. Finally, tourist expenditure is heavily contingent on other trip-related choices, such as the mode of transport, the length of stay and the type of accommodation selected (Wang & Davidson, 2010).

2.2. Price-sensitivity and expenditure during shocks

Several studies have documented that expenditure and price elasticities vary substantially over the business cycle (Smeral, 2012). The vast literature that has analyzed tourists' behavior during economic crises agrees that consumers cut down their tourist expenditures during downturns because of income drops (Bronner & De Hoog, 2012; Campos-Soria et al., 2015; Eugenio-Martín & Campos-Soria, 2014; Khalid et al., 2020). According to the conceptual framework developed in Kamakura and Du (2012), positional goods/services such as tourism are likely to reduce their expenditure shares for any given budget in a greater proportion than other more essential goods. Nonetheless, demand reactions seem to be asymmetric over the cycle (Smeral & Song, 2015), particularly for the case of summer trips. For instance, Bronner and de Hoog (2017) show that expenditure on vacation trips increases more during expansions than it drops during recessions. From this viewpoint, tourism demand is highly resilient, and despite travel restrictions and health risks, a nonnegligible share of people continued traveling during the summer of 2020 (Boto-García & Baños-Pino, 2021).

Similar to economic downturns, health crises also result in important drops in arrivals and expenditures (Rosselló et al., 2017), with the magnitude of the effects proportional to the duration of the disease outbreak (Page et al., 2012; Smorfitt et al., 2005). Empirical evidence from SARS 2003 points to notable drops in total expenditure and expenditure per capita (Senbeto & Hon, 2018). Importantly, expenditure drops not only affect the tourism sector but

also expand to other related industries (Rassy & Smith, 2013). In the COVID-19 context, Pham et al. (2021) document that tourist expenditure decreased by approximately 80% in Australia. According to the estimates presented in PlzÁková and Smeral (2022), it appears it will take time to recover the prepandemic expenditure levels in Europe.

The work by Baños-Pino et al. (2021) is, to our knowledge, the only one that has investigated in detail whether the pandemic has induced a change in tourists' daily expenditures at the destination at the individual level. Exploiting survey data for the summer periods of 2019 and 2020 and using advanced econometric methods to draw causal inferences, they show that total daily expenditures have remained unchanged. However, there is evidence of a shift in the money allocated to the different tourism items: daily expenditure per person on transportation within the region and leisure activities has increased, while that on accommodation has decreased. This work therefore suggests that tourists change the goods on which they spend their money during health shocks. A limitation of their study is that they do not consider price variations between the prepandemic and postpandemic outbreak scenarios.

In the following section, we provide a theoretical characterization of two countervailing effects that might produce shifts in the expenditure–price elasticity of opposite signs.

3. THEORETICAL FRAMEWORK

Assume that individuals make a trip abroad during the summer period and choose a region j in destination country k according to their preferences over hedonic characteristics (Lancaster, 1966). Assuming their vacation planning follows a staged process (Eugenio-Martín, 2003), tourists sequentially decide the length of the stay, the mode of transportation and where to lodge (accommodation choice). All these travel-related aspects involve different costs. While most of them are preallocated (i.e., the tourist knows the expected expenditure on some commodities beforehand), others are unplanned (i.e., engagement in a tourist activity at destination or dining out).

Economic theory postulates that expenditure decisions reflect the combinations of goods that maximize consumers' utilities given prices and preferences subject to the budget constraint (Varian, 2010). Total expenditure in a prepandemic (normal) state of the world can be expressed as the product of prices and quantity demanded as follows:

$$\text{Expenditure}_0 = p_0 \times f(p_0, I_0, \omega_0) = g(p_0, I_0, \omega_0) \quad (1)$$

where subindex 0 denotes a baseline period, p is an indicator of tourism prices in region j , I is disposable income, and ω reflects other factors affecting expenditure such as tastes or the composition of the tourism basket. Assuming length of stay, type of accommodation and transportation mode choices have been preallocated, these decisions are likely to be relevant expenditure shifters. Accordingly, the expenditure function in (1) takes $f(p_0, I_0, \omega_0)$ as a conditional demand function in the sense of Pollak (1969; 1971). That is, this framework assumes that other tourism-related decisions (outside goods' allocation) are given and models tourism expenditure conditional on that.

Considering that tourism is a normal good (Alegre et al., 2009), the expenditure function is increasing in income and varies depending on tourist individual preferences. The partial derivative of the expenditure function with respect to price ($\frac{\partial \text{Exp}_0}{\partial p_0}$) is undetermined a priori since it depends on the price elasticity of demand. It will be positive (negative) if the price elasticity is inelastic (elastic) and nonsignificantly different from zero in the case of unitary price elasticity. This directly follows from the fact that the price-elasticity of demand (number of tourists) is always negative. A detailed mathematical decomposition on this can be found in Rosselló-Nadal (2022).

Suddenly, there is an outbreak of an epidemic disease that quickly becomes a pandemic (COVID-19). In this new context, there are two countervailing effects that might affect expenditure–price elasticities.

Expenditure elasticities under no preference change

On the one hand, suppose first that individual preferences for tourism goods do not change after the pandemic outbreak. That is, the marginal rate of substitution of tourism for an outside good remains the same (i.e., the consumer is willing to trade units of one good for another in the same proportion as before). Under a sudden price surge, Zhang et al. (2020) argue that the perceived threat of the disease alters people's mood and magnifies individuals' negative emotional reactions to disadvantaged price inequality. In this regard, extant works have shown that mood alters judgement, decision-making and economic choices (e.g., Murray et al., 2010; Shu, 2010).

From this perspective, consumers might become more sensitive (elastic) to price changes. Indeed, some studies show that perceived price unfairness constrains firms' attempts to maximize profits (Kahneman et al., 1986) because consumers develop feelings of disappointment or anger toward increased prices (Xia et al., 2004). Price fairness, understood as the consumer judgment of whether the price paid for a service is reasonable/acceptable, is therefore a critical aspect of any economic transaction and involves a comparison of the price paid with a reference point.

Beyond negative emotions, other channels might provoke greater price sensitivity. When a tourist visits a foreign country, there is high uncertainty about price levels, which forces them to form expectations. If the paid price for a given commodity is higher than the expected one, people tend to become loss averse (particularly during a disease outbreak) and prefer to buy cheaper goods in subsequent purchases (Karle et al., 2015). Unsatisfied expectations therefore affect consumer choices and expenditure decisions because they avoid disappointment (Gul, 1991).

Furthermore, the uncertainty that surrounds COVID-19 might lead consumers to save more and contribute to an increase in precautionary wealth. In other words, the propensity to save increases during downturns in response to uncertainty regarding future income. A large body of literature in economics has shown that precautionary savings during uncertain times produce notable drops in consumption expenditures (Lugilde et al., 2019; Lusardi, 1998; Merrigan & Normandin, 1996). In the COVID-19 context, Hodbod et al. (2021) document that a share of the drops in consumption in tourism and hospitality sectors is driven by the saving motive. According to Kimball (1990), the precautionary saving motive can be theoretically conceptualized as a positive sign in the third derivative of the utility function. Consequently, when prudence increases, income uncertainty reduces the marginal propensity to consume at a given level of consumption. On these grounds, our first research hypothesis is the following:

H1: Under *no preference change*, negative emotions to disadvantaged price inequality, loss aversion and precautionary savings motive make tourists to become price elastic, thereby decreasing their *expenditure-price* elasticity with respect to tourism goods during the pandemic.

Expenditure elasticities under preference change

On the other hand, suppose in contrast that the pandemic outbreak shifts individual preferences over tourism goods. For instance, some studies have shown that travelers during the COVID-19 outbreak modify their tourism basket composition by changing the accommodation dwelling (Peco-Torres et al., 2021), the mode of transport (Miao et al., 2021) or the type of activities performed at their destination (Ren et al., 2022). That is, because their personal safety is compromised and they want to minimize the risk of infection, consumers choose accommodation or transportation alternatives that ensure social distancing. Consequently, consumers' greater demand for hygiene and safety likely enhances their preference for high-quality products (Kim et al., 2021; Ma et al., 2019). Because the pandemic magnifies the inherent uncertainty about the quality of tourism services (particularly with respect to hygiene aspects), tourists infer it by their price (Rao, 2005), which translates into an observed greater willingness to pay through a greater demand for quality. In economic terms, this might imply that the indifference curves in the tourism–outside good space likely change their shapes during the pandemic through shifts in tastes. That is, for the same income, the optimal combination of tourism and non-tourism goods changes. For example, consumers might become less prone to trade a high-quality accommodation that ensures cleanliness by an outside good, making the marginal rate of substitution of tourism for the outside good less steep for each combination of goods. As a result, individual demands for a given tourism good would become steeper (less elastic), and therefore, their expenditure–price elasticity is predicted to become higher than in the prepandemic state of the world.

An alternative theoretical rationale for preference shifts over tourism goods can be found in the recent developments in loss aversion and prospect theories. Several studies have shown that when reference points change from certain (i.e., prepandemic) to stochastic (i.e., postpandemic outbreak), consumers exhibit the so-called *endowment effect for risk* (Koszegi & Rabin, 2006; 2007; Sprenger, 2015): risky endowments lower risk aversion. Put differently, the health shock increases general economic and health risks, making reference points riskier. A direct consequence is that a riskier context makes people become more present biased in the sense of Laibson (1997), prioritizing current over future consumption. This implies that the pandemic and the uncertainty surrounding its evolution and future recurrences produce less self-control and greater demand for immediate reward à la Gul and Pesendorfer (2001), which might result

in overspending.¹ Along these lines, Gassman et al. (2022) show that patience and risk aversion declined during the first wave of the pandemic, concluding that traumatic events change behavioral preferences. All in all, a second research hypothesis is the following:

H2: Under *preference change*, consumers' greater demand for hygiene and safety under quality uncertainty together with potential endowment effects for risk that lowers risk aversion make tourists to become more price inelastic, thereby increasing their *expenditure-price* elasticity with respect to tourism goods during the pandemic.

The expenditure function in a postpandemic outbreak state of the world can be expressed in the following way:

$$Expenditure_1 = p_1 \times f(p_1, I_1, \omega_1) = g(p_1, I_1, \omega_1) \quad (2)$$

As a result of these two contrasting effects, the expenditure–price elasticity is likely to change in the new context (i.e., $\frac{\partial Exp_1}{\partial p_1} \neq \frac{\partial Exp_0}{\partial p_0}$). Whether it would be greater than, lower than or equal to that in the prepandemic period is undetermined a priori. It would depend on the relative weight of the two abovementioned effects (i.e., preference change). It would decrease under H1 (more elastic demand, $\frac{\partial Exp_1}{\partial p_1} < \frac{\partial Exp_0}{\partial p_0}$) if the price inequality/precautionary savings motive effect dominates the shift in preferences over high-quality (and high-priced) tourism services caused by the endowment effect for risk and vice versa under H2. It would remain unchanged ($\frac{\partial Exp_1}{\partial p_1} = \frac{\partial Exp_0}{\partial p_0}$) in case both effects compensate for each other (neither H1 nor H2 are true).

¹ These authors develop a model in which agents with self-control problems cannot resist the temptation of consuming now. Apparent changes in preferences towards present consumption can be caused by the inability to resist temptation. In tourism research, Nguyen (2016) documents that present bias results in overspending behavior.

4. DATA

Our study takes Spain as the destination country of analysis. There are several reasons that make the Spanish case of relevance. First, Spain was one of the countries most affected by COVID-19 in terms of both infections and deaths per 100,000 inhabitants during the first wave, according to data from John Hopkins University (<https://coronavirus.jhu.edu/map.html>). Second, it was the second most visited country in the world before the pandemic, with over 80 million arrivals per year. Most importantly, given the high dependence of its economy on the tourism sector (Minondo, 2021), a proper understanding of foreign tourists' expenditure patterns during pandemic times is of high economic relevance. In this regard, a growing body of literature has examined tourism demand reactions to COVID-19 in Spain (Baños-Pino et al., 2021; Boto-García & Leoni, 2021; Boto-García & Mayor, 2022; Peco-Torres et al., 2021).

We use microdata on the expenditures made by foreign tourists visiting Spain from EGATUR. This is a monthly survey conducted by the Spanish National Statistics Institute that collects information on expenditures and other travel aspects for a representative sample of nonresidents visiting the country. Respondents are sampled at train stations, ports, airports and road borders while they exit the country. Since most tourists travel in the summer period, we use data for July and August in 2019, 2020 and 2021. The sample is restricted to leisure tourists who spent at least one night in Spain (and less than 90 days). Therefore, same-day visitors (people in transit to other countries) and tourists for other purposes (e.g., business) are not considered. The pooled dataset involves a total of 34,197 foreign tourists.

Together with expenditure, we have information on some tripographics, such as the length of stay (*LOS*), the type of accommodation (hotels, other market accommodations such as rural houses, camping or Airbnb, and nonmarket accommodations such as second homes), the mode of transport (car/bus, plane, boat/cruise or train) and the purchase of a travel package. This dataset is merged with regional (autonomous community of destination) price indices for three major tourist commodities: transportation (*Ptrans*), bars and restaurants (*Pbarrest*) and leisure activities (*Pleisure*).² These data are also drawn from the National Statistics Institute as

² In preliminary analyses and robustness checks, we also considered the price index for accommodation services (*Paccom*). However, this variable is highly correlated with *Pbarrest* (corr=0.702) so that its inclusion in the regression analysis would produce collinearity and identification problems. For this reason, we consider *Pbarrest* in the main analysis and replace it by *Paccom* in robustness checks.

subindices of the Consumer Price Index at the regional level per period. These price indicators therefore vary across the autonomous communities of destination (NUTS 2) and across year–months.

Typically, detailed price information for each tourism good is almost never available. In this situation, the common way to proceed is to use destination price indices as proxies (Morley, 1994). This assumes that all tourists at the same destination and period face the same prices, so it can be taken as numeraire within submarket–period combinations (Deaton & Muellbauer, 1980). It offers the additional advantage that prices can be taken as conditionally exogenous for individual choices given the chosen destination region.³ As a result, the researcher avoids the common endogeneity problems encountered when estimating demand functions.

5. ECONOMETRIC MODELLING

To study the changes in the price elasticity of demand throughout the pandemic, we estimate the following regression model:

$$\begin{aligned}
 \ln Expenditure_{it} = & \alpha + \delta_1 d_{2020_{it}} + \delta_2 d_{2021_{it}} + \beta_1 Ptrans_{it} + \beta_2 Pleasure_{it} \\
 & + \beta_3 Pbarrest_{it} + \gamma_1 d_{2020_{it}} \times Ptrans_{it} + \gamma_2 d_{2020_{it}} \times Pleasure_{it} \\
 & + \gamma_3 d_{2020_{it}} \times Pbarrest_{it} + \lambda_1 d_{2021_{it}} \times Ptrans_{it} \\
 & + \lambda_2 d_{2021_{it}} \times Pleasure_{it} + \lambda_3 d_{2021_{it}} \times Pbarrest_{it} + \tau August_t + \theta W_{it} \\
 & + \mu_{ct} + \epsilon_{it}
 \end{aligned} \tag{3}$$

where i indexes tourists (for $i = 1, \dots, N$) and t time periods (for $t = July\ 2019, August\ 2019, July\ 2020, August\ 2020, July\ 2021, August\ 2021$), W_{it} gathers preallocated travel-related decisions that partially explain level differences in expenditure (length of stay, type of accommodation, package purchase and mode of transport), μ_{ct} are interactive country of origin–time fixed effects (e.g., Germany–2020) that capture uncontrolled expenditure differences across nationalities and time periods, ϵ_{it} is the error term, and the rest

³ This is because individual tourists made their expenditure decisions taking existing prices as given. Since price subindexes are calculated as the weighted sum of a large set of items, their variation is independent of consumer’s i consumption decisions.

of the variables are the same as defined before. By specifying a model with interactions, asymmetric expenditure elasticities per summer period can be estimated (relative to 2019).⁴

The three price indicators are included in the specification to estimate the distinct expenditure elasticities for each service. They are weakly correlated, so their joint inclusion into the model does not produce collinearity problems (see Table A1 in Supplementary Material for the correlation matrix). The interaction terms between the year dummies and the price indices (γ_1 , γ_2 and γ_3 for 2020, and λ_1 , λ_2 and λ_3 for 2021) allow us to test whether the corresponding price elasticities have changed throughout the pandemic, informing about both the magnitude and the sign direction change (if any). Specifically, if they are positive and statistically significant, this would imply that there is preference change and the expenditure–price elasticity has increased. Conversely, there would not be preference change if they are negative and statistically significant (expenditure–price elasticity has decreased).

Unfortunately, the dataset does not provide information about individual income. This is a common limitation in most official surveys, given the usual concern exhibited by people to report their income. To control for it, the specification includes a full set of interactive country of origin–time fixed effects in the sense of Bai (2009) that capture any time-variant country-of-origin specific factor that affects expenditure (e.g., income, price changes at origin or epidemiological circumstances).

We adopt a log-linear specification, as it is customary in most tourism expenditure studies (Rosselló-Nadal & He, 2020) because the price coefficient estimates can be interpreted as expenditure semielasticities.⁵ Figure 2 presents the histogram of expenditure (in logs) for each period. The log transformation also helps the error term approximate the normal distribution.

⁴ The inclusion of travel-related characteristics in the regression is important in this context to avoid biased estimates of the expenditure–price elasticities. We need to control for the source of variability in expenditure not attributed to prices but to heterogeneity associated with the tourist profile. These variables capture pre-allocated travel decisions that condition unplanned expenses given the budget constraint. See also Rosselló-Nadal (2022) about the role of control variables for the estimation of expenditure–price elasticities.

⁵ Note that since prices are measured using indices, the partial derivative is interpreted as the percentage change in expenditure associated with a marginal increase in the price index, which implies a percentage change in prices.

The model in (3) is estimated using both OLS and quantile regression.⁶ The latter methodology allows us to inspect differences in expenditure semielasticities along the expenditure distribution.

FIGURE 2 HERE

6. RESULTS

6.1. Descriptive analysis

Prior to the econometric analysis, we present some descriptive statistics of the dataset. Approximately 42% of the sample came in the summer of 2019 (14,554 individuals), 23% in 2020 (8,001 individuals) and the remaining 34% in 2021 (11,642 individuals). Although there was a sharp drop in the number of foreign tourists in the first summer after the pandemic outbreak, in 2021 part of the inflow of tourists recovered. A decomposition of the number of tourists in the sample and percentage shares per origin and year is presented in Table A2 in Supplementary Material. British (23.3%), French (13.9%) and German (10.7%) tourists represented the largest shares before the pandemic. However, during the summer periods of 2020 and 2021, the shares of British tourists have substantially decreased (16.9% and 13.2%) whereas that for French (17.5% and 19.5%) and Germans (16.7% and 13.1%) increased. Also remarkable is the large drop in the number of Russian tourists and the rise in the inflow of tourists from the rest of Europe during the pandemic.

The average expenditure is €1,300, with a standard deviation equal to €737.68. If we distinguish by summer period, an interesting U-shaped pattern is documented: the mean expenditure is approximately the same in the summers of 2019 (€1,330.4) and 2021 (€1,330.9) but notably lower in 2020 (€1,196.8). Figure 1 plots the mean expenditures made by foreign tourists per year and country of origin. Total expenditure figures and the sample composition of foreign tourists per year and country are presented in Supplementary Material, Figure A1. Interestingly,

⁶ As shown in Figure 2, by taking logs the distribution of expenditure becomes normally distributed. Since no respondent has zero expenditure, a linear regression provides consistent estimates, and other alternative models such as Tobit are not needed.

tourists from Russia, the United States, the rest of America and other parts of the world exhibit the largest expenditures per person, both before and during the pandemic.⁷

FIGURE 1 HERE

Table 1 presents the summary statistics of the expenditure per person, price indices and the rest of the variables considered per summer period. Figure A2 in the Supplementary Material plots the time evolution of the three price indices per region. Overall, transport prices exhibited a U-shaped pattern: they decreased in 2020 relative to 2019 but then notably increased, on average, in 2021. The prices of leisure activities by contrast suffered an almost linear decrease over time, being lower in 2021 than in the prepandemic summer. In contrast, the prices of bars and restaurants remained quite constant over time. Nevertheless, there are important regional differences. Figures A3, A4 and A5 in the Supplementary Material map show the percentage rate changes in the three price indices for August 2020 and August 2021 (in both cases relative to August 2019) per autonomous community. We document that price changes have been highly heterogeneous across Spanish regions, both over time and across tourism services.⁸ This geographical and temporal variability is exploited for identification in the econometric analysis.

TABLE 1 HERE

For the rest of the variables, the average length of stay slightly increased during the pandemic, with a drop in the share of tourists traveling by car in favor of a larger share of plane travelers. The share of tourists hiring a travel package also decreased, with a nonnegligible rise in the percentage of tourists who stayed at nonmarket accommodations (e.g., second residences) and a lower percentage of hotel guests.

⁷ However, when we look at aggregate expenditure, we document that those from the United Kingdom represent the greatest share of total expenditure before the pandemic. In the summer periods of 2020 and 2021, German and French tourists gained importance (see Supplementary Material).

⁸ As a matter of fact, the use of price indices has the main shortcoming that they do not capture level price differences at the base period. However, this is not problematic, since our analysis exploits the temporal variation in prices throughout the pandemic relative to the baseline period (summer of 2019).

6.2. Main findings

Table 2 presents the estimation results from OLS and quantile regressions. Column 1 presents the estimates from OLS, while Columns 2-4 report those from quantile regressions at the 25th, 50th and 75th quantiles. In all cases, standard errors are clustered at the autonomous community of destination level to consider potential cross-sectional correlation in the residuals (Boto-García, 2022). Indeed, Parente and Santos-Silva's test on intracluster correlation (Parente & Santos-Silva, 2016) supports the need for clustering adjustment in the standard errors. The coefficient estimates for the country–time fixed effects are not presented to save space but are shown for the OLS regression in Figure 3 below.

FIGURE 3 HERE

TABLE 2 HERE

Starting with the OLS regression, on average, expenditure decreases by 6.7% and 2.3% per marginal increase in the prices of transportation services and bars and restaurants at the destination, respectively. This indicates that the demand for these two tourism commodities is elastic. The high elasticity with respect to transportation prices is consistent with Fleissig (2021). In contrast, the expenditure–price elasticity of leisure activities is not significantly different from zero. Consistent with microeconomic theory, this is interpreted as evidence that the price elasticity of demand for leisure activities is unitary. When we move to the interaction terms, we document three interesting results: (i) the expenditure elasticity of transportation services becomes higher in 2020 (supporting H2 for this service) but does not differ in 2021 relative to 2019, (ii) the expenditure elasticity of bars and restaurants remains unchanged over the course of the pandemic, and (iii) the expenditure elasticity of leisure activities decreases after the COVID-19 outbreak (supporting H1 for this service).⁹

The increase in the expenditure elasticity of transportation in 2020 is consistent with the observed increase in the share of tourists that travel by plane and train this year as compared to

⁹ As illustrated in Figures A2-A5 in the Supplementary Material, we should bear in mind that prices increased over the study period in bars and restaurants, decreased in the case of leisure activities and exhibited a U-shaped pattern for transportation services. Accordingly, the estimates imply that expenditure decreased with the observed decline in the prices of both transportation and leisure activities.

2019 (Table 1). An auxiliary multinomial logit regression of mode of transport choice (Supplementary Material, Table A3) confirms that the log-odds of traveling by plane and train (compared to by car) significantly increased by 0.896 and 1.68 points in 2020 relative to 2019, respectively. This switch towards comparatively more expensive and faster modes of transport (preference change) likely explains the detected increase in the expenditure–price elasticity (only in 2020). This result is nonetheless surprising, as the related literature points to people preferring traveling by private car over public transportation modes during COVID-19 (Christidis et al., 2022; Eisenmann et al., 2021). Most likely, this finding is driven by a selection mechanism: in the summer of 2020 those who continue traveling are mainly those for whom traveling is a ‘priority’ good (Boto-García & Baños Pino, 2021). As such, if they travel, they might be willing to pay more for faster means of transport that avoid waiting times, multiple connections and stopovers.

The stability of the expenditure elasticity with respect to the prices of bars and restaurants during the pandemic is interpreted as evidence that H1 and H2 compensate each other. On the one hand, consumers’ greater demand for hygiene and safety likely makes some consumers to be willing to pay greater prices for bar and restaurant services (Kim et al., 2021; Ma et al., 2019) to guarantee certain quality standards in the sense of Rao (2005). From this viewpoint, the expenditure–price elasticity would increase. On the contrary, price surges might produce negative affection and feelings of price unfairness on some other consumers as formulated in Xia et al. (2004) and Zhang et al. (2020). If prices are also above reference points, loss aversion and avoidance of disappointment motives (Gul, 1991) predict these consumers to become more price elastic and therefore the expenditure-price elasticity to decrease. Accordingly, it seems that both forces act in opposite directions leaving the elasticity of bars and restaurants unchanged.

Finally, the significant drop in the elasticity of leisure activities in 2020 and 2021 implies that H1 holds for this service. Precautionary saving motives during uncertain times (Lugilde et al., 2019; Lusardi, 1998) might induce tourists to reduce their propensity to engage into recreational activities at destination, which might receive less priority when assigning the travel budget than the mode of transport or the type of accommodation. Additionally, the avoidance of social interactions and crowded environments to minimize infection risks (Li et al., 2020; Park et al., 2021) might also explain why the expenditure-price elasticity of this category decreases during the pandemic.

Moving to the quantile regressions, we document that the change in the expenditure–price elasticities of transportation and bars and restaurants is quantitatively smaller as we move to the upper part of the expenditure distribution. For the case of leisure activities, tourists are also comparatively more inelastic at low expenditure levels. This is visually presented in Figure 4, which plots the coefficient estimates and confidence intervals for both OLS and quantile regressions. Therefore, the expenditure–price elasticity remains comparatively pretty unchanged during the pandemic among high-income tourists; it is the low-income segment that experienced greater elasticity shifts (in both directions) during COVID-19 times. This result points to heterogeneous shifts in expenditure allocation across tourism goods during the pandemic.

FIGURE 4 HERE

Interestingly, no mean expenditure differences are detected among the three summer periods, *ceteris paribus*. This is consistent with Baños-Pino et al. (2021) and with the descriptive evidence presented in Table 2 and Figure 2: those who visited Spain spent approximately the same per person before and during COVID-19. Expenditure is positively associated with the length of stay, as in Alegre and Pou (2016), but negatively related to lodging at nonmarket accommodations. Furthermore, expenditure is notably greater for plane travel, with those coming to Spain by car/bus spending the least.

6.3. Heterogeneity per country of origin

Several works have documented that the price sensitivity of tourists varies depending on the origin country (Cortés-Jiménez & Blake, 2011; Crouch, 1996; Peng et al., 2015). The theoretical rationale is that habits, cultural traits, the degree of economic development and the tourism attractiveness of the source country shape consumers' reaction to price changes when traveling abroad. To inspect heterogeneity in expenditure–price elasticities, we conduct separate regressions by source market. Table 3 reports OLS regressions of the model in (3) per origin. We document remarkable differences across nationalities in both sign and magnitude. Starting with the baseline (prepandemic) period, the expenditure–price elasticity of transportation is negative (elastic demand), on average, for Germany, France, the Netherlands and the United Kingdom and not significantly different from zero (at the 95% confidence level)

for the rest. This is interesting, as it indicates that tourists from neighbouring countries are more sensitive to prices than those coming from distant locations. Similar results are found with respect to the elasticity of bars and restaurants. The corresponding elasticity for leisure activities is positive (inelastic demand) for those coming from the Netherlands, Portugal and other European countries (including Belgium, Ireland, Switzerland, Russia and Nordic countries, among others) but not different from zero (unitary elastic demand) for Germany, France, Italy and the United Kingdom.

TABLE 3 HERE

We also find that the expenditure elasticity of the prices of transportation significantly increased (demand became more inelastic) during the summer of 2020 for tourists from Germany, the Netherlands, the United Kingdom, the USA and the rest of America. Accordingly, we do not reject H2 but reject H1 for these tourists. Similar results apply to the expenditure elasticity of the prices of bars and restaurants for tourists traveling from Germany, the Netherlands and the United Kingdom, who all became more demand inelastic. In contrast, when looking at leisure activities, expenditure elasticity decreased (demand became more elastic) for Germany, France, the Netherlands, Italy, the United Kingdom, other European countries, the USA and the rest of America. Therefore, we do not reject H1 but reject H2 in this case. As before, expenditure is positively associated with the length of stay, it is significantly larger (lower) among those traveling by plane (staying at nonmarket accommodations), and it does not vary per summer period, *ceteris paribus*.

6.4. Robustness checks

We have performed some robustness checks to our main analysis. First, we have replaced the price index for bars and restaurants ($P_{barrest}$) by the price index for accommodation services (P_{accom}) (Supplementary Material, Table A4). The estimation results are very similar to the ones presented in Table 2. Because of the high correlation in the regional prices of accommodation services and bars and restaurants, the estimated expenditure-price elasticity for P_{accom} is close to that for $P_{barrest}$ but lower in magnitude (-0.023 vs -0.003). This implies that tourists' expenditure is more sensitive to price variations in bars and restaurants than in accommodation services. Interestingly, the elasticity of P_{accom} has remained unchanged during the pandemic as none of the interaction terms is statistically significant.

Second, the examination of the pandemic-induced change in expenditure–price elasticities relies on their stability in the pre-pandemic period. To explore this, we have repeated our model estimation including data for the summer of 2018. Table A5 in Supplementary Material reports the results. None of the interaction terms for the summer of 2019 (relative to the summer of 2018) is statistically significant, implying that the elasticities remained unchanged in the pre-pandemic period. Accordingly, the detected change in the expenditure–price elasticities presented in Tables 2 and 3 can be interpreted as pandemic-induced shifts in preferences.

7. DISCUSSION AND CONCLUSIONS

7.1. Discussion

Since tourists' expenditure is considered one of the main indicators of tourism demand, it is necessary to evaluate how sensitive foreign tourists who continued traveling during the pandemic are to price variations. This paper has developed a theoretical framework that postulates contrasting views about tourists' consumption reactions during health shocks based on solid theory in economics, psychology, and marketing. Taking Spain as the case study, we have run OLS and quantile regressions with interaction terms to uncover potential changes in expenditure–price elasticities for transportation, bars and restaurants and leisure activities over the course of the pandemic. Our results show that prior to the pandemic, foreign tourists' expenditure–price elasticity was negative for transportation and bars and restaurants but not significantly different from zero for leisure activities. This implies that, under normal circumstances, tourists' expenditure reacts more to price surges in transportation and/or bars and restaurants than to leisure services. According to microeconomic theory, the demand for transportation and bars and restaurants is elastic but unitary for leisure activities. Interestingly, the separate analysis per country of origin indicates a greater price sensitivity among those coming from neighbouring countries like Italy or France.

After the COVID-19 outbreak, we document that expenditure has become more (less) price sensitive in transportation (leisure activities). This indicates that demand for transportation services (leisure activities) is comparatively more inelastic (elastic) during pandemic times. In contrast, the elastic demand of bars and restaurants has remained unchanged. Given that prices during the study period increased in bars and restaurants, decreased in the case of leisure

activities and exhibited a U-shaped pattern for transportation services (Figures A2-A5 in Supplementary Material), our findings imply that overall expenditure decreased proportionally more with any marginal increase (decrease) in the price of leisure activities (transportation services) with respect to the prepandemic state of the world.

According to our framework, the decline in the expenditure–price elasticity of foreign tourists in leisure activities during the pandemic (higher price elasticity of demand) is explained by the reduction in the marginal propensity to consume (Hodborod et al., 2021) due to income uncertainty (precautionary savings motive) and negative emotional reactions to price surges (equity theory) during COVID-19 times (Zhang et al., 2020). Therefore, H1 is supported for leisure activities like visiting museums, theme parks or gambling. That is, the observed price increases in these tourism services have reduced overall expenditure to a greater extent than in the prepandemic summer. This finding is in line with a large body of literature documenting lower discretionary spending on some nonessential goods in general (Kamakura & Du, 2012) and tourism services in particular (Khalid et al., 2020) during economic downturns. Importantly, the results from quantile regression indicate that the decline in expenditure as prices go up is quantitatively greater at low quantiles of the expenditure distribution. This finding is totally compatible with our precautionary savings interpretation: low-spending segments are relatively more deterred to spend money on leisure activities during COVID-19.

For the case of bars and restaurants, expenditure elasticity has not significantly changed in comparison to the pre-COVID-19 summer, even though prices increased as the pandemic evolved. Therefore, neither H1 nor H2 apply to bars and restaurants. It appears that potential feelings of disappointment toward increased prices (Kahneman et al., 1986; Xia et al., 2004) among some segments on one side, and the potential endowment effect for risk (Koszegi & Rabin, 2006; 2007) that might induce overspending and present bias à la Laibson (1997) and Gul and Pesendorfer (2001) among other segments on the other side likely compensate for each other in the population.

Moving to transportation services, the greater expenditure–price elasticity (more inelastic demand) documented during 2020, when prices decreased, indicates a preference change, supporting H2 for this tourism service. Although prices decreased and expenditures were elastic in 2019, demand became inelastic and barely reacted to price changes during the first pandemic summer. As discussed before, this potentially reflects preference change towards faster and

safer means of transport that minimize waiting times and stopovers. However, this pattern only applies to the summer of 2020; in 2021, the demand for transportation is again elastic (as in 2019). Furthermore, separate regressions by country of origin suggest that the sensitivity of expenditure to prices varies substantially depending on sociocultural dimensions, as previously documented in previous works (Álvarez-Díaz et al., 2015; Crouch, 1996; Peng et al., 2015).

7.2.Theoretical and empirical contributions

This research makes several contributions to the tourism literature, both theoretically and empirically. From a theoretical viewpoint, the paper integrates standard microeconomic theory with price inequality (Kahneman et al., 1986), precautionary savings (Kimball, 1990), reference-dependent preferences (Koszegi & Rabin, 2006; 2007) and prices as quality cues (Rao, 2005) theories in a unified framework. We show that tourists' expenditure–price elasticity might vary in opposite directions during health shocks depending on preference change over the different tourism services considered. We have shown that the sign and magnitude of the expenditure–price elasticity with respect to each tourism good can inform about potential shifts in preferences during disease outbreaks.

Under preference stability, tourists' demand likely becomes more price elastic because of increased income uncertainty (precautionary savings motive) together with negative reactions to disadvantaged price inequality, as documented by Zhang et al. (2020). In contrast, when there is a preference change (lower marginal rate of substitution for an outside good) so that tourists give more value (greater willingness to pay) to a given tourism good/service, individual demands become more inelastic. Under quality uncertainty and due to the risk of infection, tourists rely more on prices as quality signals. The endowment effect for risk by which health shocks enhance overall risks might also produce a higher expenditure–price elasticity through overspending (Nguyen, 2016) and demand for immediate reward. Given that the overall effect on tourists' expenditure is theoretically undetermined, the study offers an empirical analysis to evaluate which effect dominates for each type of tourism service.

7.3.Practical implications

This study has profound implications for tourism management during the post-COVID-19 recovery. The tourism sector involves several subindustries, and it seems highly important to uncover how foreign spending reacts to the distinct pricing strategies implemented by the

different travel sectors involved. From a marketing viewpoint, our paper allows hospitality and destination managers to identify travel-resilient segments (Boto-García & Baños-Pino, 2021). As we have shown, expenditure–price elasticities notably vary by country of origin and type of tourism services considered. As a result, marketing campaigns can be reoriented toward segments whose expenditures are less affected by price surges.

From a pricing perspective, hospitality firms face a critical trade-off between quality and prices, which has been reinforced in the pandemic context given consumers' avoidance of crowded places to avoid contagion risks (Park et al., 2021). In light of the findings, leisure enterprises must avoid rising prices during health shocks, especially those that concentrate on the foreign segment. Although under uncertainty increased prices are perceived as quality cues (Rao, 2005), our results suggest that in the case of leisure activities, tourists develop negative emotional reactions to price increases, in line with Zhang et al. (2020). In the transportation sector, the price drops that took place during the summer of 2020 were ineffective at enhancing demand and expenditure.

Overall, in line with the robust literature on asymmetric loss aversion (Koszegi & Rabin, 2006; 2007), these two findings suggest that losses with respect to reference prices (increased prices in leisure services) carry more weight more than equal-sized gains (reduced prices in transportation). Consistent with the theoretical developments by Heidhues and Koszegi (2008), hospitality firms might be aware that price cuts might be ineffective strategies to enhance demand during health shocks.

Our results are of key relevance in the current inflation crisis, in which tourism managers are forced to increase prices due to increasing costs. As documented by Khalid et al. (2020), inflation erodes consumers' purchasing power and deters international travel. Given the heterogeneous sensitivity by origin, targeting visitors with high expenditure–price elasticity from countries with lower price inflation could be a promising strategy in situations where price surges are unavoidable. Moreover, policy makers should consider the modification of tourism taxes to contain the surge in tourism prices.

7.4. Limitations and future research

Our study has some limitations that should be acknowledged and that can inspire future works. Firstly, our analysis uses information for foreign tourists who traveled to Spain. The shifts in

expenditure elasticities we document are therefore subject to potential selection effects. As documented in previous works (Boto-García & Leoni, 2021; Li et al., 2021), at least during the summer of 2020, many tourists opted to travel domestically or to nearby countries. Since there is evidence of heterogeneity in loss aversion among tourists (Nicolau, 2012), we cannot completely rule out that the findings are partially affected by a composition effect. Future studies can provide further empirical support by examining the changes in expenditure-price elasticities among domestic tourists or considering other destination countries.

Secondly, we use composite price subindexes at the autonomous community level. This has the drawback that they do not consider base price levels, potential quality changes or within-region price dispersion. If available, future works on the topic should expand our work by considering more disaggregated price information. Moreover, data about the quality of tourism goods and services could be highly valuable to separately identify price effects from quality effects on demand. This is highly relevant, as observed changes in expenditure–price elasticities are potentially driven by demand for quality.

Thirdly, we unfortunately lack information about individual income and labour market prospects, which could better isolate the role of the precautionary savings motive. Similarly, information about psychometric variables like impulsiveness, self-control or risk traits could better capture the role of present bias and the *endowment effect for risk* in explaining the relationship between prices and expenditure. One fruitful area for research is to empirically document the relative influence of income and preference change on expenditure shifts and budget reallocations among categories. From this viewpoint, experimental design studies could complement our findings by identifying how individuals allocate their budget among alternative goods in contexts of quality uncertainty and price increases. More work is needed on tourists' heuristic use of prices as quality cues under information asymmetry.

Finally, price changes exert different effects on expenditure depending on the origin county. Aside from cultural differences, this could be partially mediated by reference prices. Tourists' negative emotional responses to price surges might depend on price levels at origin that act as benchmarks for price unfairness. Future studies should deepen into this by linking expenditure decisions at destination with the gap between prices at destination and origin.

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Year	2019		2020		2021	
Variable	Mean	SD	Mean	SD	Mean	SD
Expenditure	1,330.4	762.8	1,196.8	657.7	1,330.9	751.2
LOS	9.1	6.9	9.8	7.4	9.7	7.7
Ptrans	108.5	1.4	104.1	1.2	112.4	1.3
Pleisure	102.7	1.4	101.0	1.2	100.4	1.3
Pbarrest	108.5	2.4	108.5	1.7	109.5	1.5
		%		%		%
Package		28.2		16.8		18.8
Car/Bus		13.5		9.2		11.8
Plane		81.8		84.6		84.2
Boat/cruise		2.6		0.9		2.5
Train		2.0		5.1		1.3
Hotel		61.7		43.9		57.4
Other market accom.		12.8		13.9		11.7
Non-market accom.		25.4		42.1		30.8
July		49.9		42.3		48.7
August		50.1		57.6		51.2

Table 1. Summary statistics

Dep. variable: ln Expenditure	(1)	(2)	(3)	(4)
Explanatory variables	OLS	Q=0.25	Q=0.5	Q=0.75
d_2020	-4.536 (4.479)	-7.550* (4.449)	-6.306 (4.344)	-3.389 (4.444)
d_2021	1.548 (2.670)	1.594 (3.537)	2.468 (2.749)	2.353 (3.909)
Ptrans	-0.068*** (0.020)	-0.096*** (0.023)	-0.079*** (0.023)	-0.055*** (0.015)
Pleisure	0.018 (0.013)	0.038** (0.016)	0.027* (0.014)	0.017** (0.008)
Pbarrest	-0.023** (0.008)	-0.029*** (0.008)	-0.024*** (0.009)	-0.017*** (0.005)
d_2020xPtrans	0.088** (0.033)	0.121*** (0.036)	0.103*** (0.033)	0.074*** (0.025)
d_2020xPleisure	-0.077*** (0.018)	-0.099*** (0.020)	-0.085*** (0.018)	-0.070*** (0.017)
d_2020xPbarrest	0.029 (0.018)	0.045** (0.019)	0.038** (0.018)	0.025 (0.015)
d_2021xPtrans	0.029 (0.021)	0.047* (0.025)	0.032 (0.026)	0.025 (0.027)
d_2021xPleisure	-0.044** (0.020)	-0.071*** (0.023)	-0.055*** (0.021)	-0.045** (0.019)
d_2021xPbarrest	-0.001 (0.011)	0.007 (0.016)	-0.001 (0.013)	-0.004 (0.018)
LOS	0.047*** (0.002)	0.049*** (0.003)	0.053*** (0.003)	0.059*** (0.003)
Package	-0.013 (0.033)	-0.010 (0.038)	-0.024 (0.037)	-0.046 (0.049)
Plane	0.434*** (0.054)	0.483*** (0.064)	0.394*** (0.048)	0.358*** (0.041)
Boat/cruise	0.276*** (0.092)	0.129 (0.142)	0.283*** (0.102)	0.394*** (0.047)
Train	0.223*** (0.043)	0.256*** (0.048)	0.217*** (0.042)	0.198*** (0.040)
Other market accom.	-0.003 (0.016)	-0.022 (0.023)	-0.026 (0.019)	-0.020 (0.023)
Non-market accom.	-0.507*** (0.036)	-0.513*** (0.051)	-0.526*** (0.030)	-0.536*** (0.019)
August	0.003 (0.012)	-0.007 (0.013)	-0.006 (0.011)	-0.008 (0.011)
Country of origin-time FE	YES	YES	YES	YES
Constant	15.013*** (2.522)	16.285*** (2.792)	15.446*** (2.728)	13.371*** (1.984)
F (p-value)	1457.15 (<0.001)			
Parente-Santos-Silva test intra-cluster correlation [p-value]		95.42 [<0.001]	102.47 [<0.001]	81.91 [<0.001]
Observations	34,197			
R-squared	0.723			

Table 2. Coefficient estimates from OLS and quantile regressions

Note: Clustered standard errors at the autonomous community of destination level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The omitted categories are d_2019, Car/bus, Hotel and July.

Dep. variable: ln Expenditure	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Explanatory variables	Germany	France	Netherlands	Italy	Portugal	United Kingdom	Other European	USA+ Rest of America	Rest of the world
d_2020	-7.098* (4.025)	-4.683 (7.560)	-9.123* (4.517)	-10.695 (11.150)	-12.644 (13.498)	-6.623 (3.947)	4.447 (5.222)	1.427 (2.374)	14.037* (7.899)
d_2021	-1.312 (3.479)	4.317 (4.962)	-6.111 (4.649)	2.810 (5.833)	12.898 (9.793)	-1.203 (3.439)	-0.639 (2.903)	1.926 (5.960)	0.322 (9.219)
Ptrans	-0.084*** (0.026)	-0.089*** (0.018)	-0.087*** (0.016)	-0.099* (0.052)	-0.089 (0.065)	-0.093*** (0.022)	-0.043* (0.021)	-0.028* (0.015)	0.038 (0.034)
Pleisure	0.016 (0.019)	0.034* (0.018)	0.044*** (0.011)	-0.020 (0.033)	0.120** (0.043)	0.043* (0.024)	0.026*** (0.008)	-0.017* (0.009)	-0.072*** (0.016)
Pbarrest	-0.031*** (0.008)	-0.027*** (0.009)	-0.033*** (0.006)	-0.036 (0.022)	0.002 (0.019)	-0.029*** (0.007)	-0.023*** (0.006)	-0.012** (0.005)	0.005 (0.010)
d_2020xPtrans	0.099*** (0.032)	0.073 (0.056)	0.119*** (0.025)	0.144* (0.082)	0.173 (0.103)	0.122*** (0.028)	0.044 (0.034)	0.065*** (0.020)	0.011 (0.057)
d_2020xPleisure	-0.083*** (0.024)	-0.061** (0.024)	-0.096*** (0.015)	-0.087** (0.035)	-0.105 (0.068)	-0.108*** (0.029)	-0.099*** (0.012)	-0.076*** (0.021)	-0.038 (0.038)
d_2020xPbarrest	0.044*** (0.015)	0.026 (0.026)	0.056*** (0.016)	0.037 (0.040)	0.046 (0.049)	0.041*** (0.013)	0.007 (0.019)	-0.006 (0.005)	-0.104*** (0.023)
d_2021xPtrans	0.055* (0.031)	0.011 (0.021)	0.088*** (0.029)	0.042 (0.059)	0.031 (0.089)	0.063** (0.028)	0.041* (0.021)	0.025 (0.030)	-0.078 (0.051)
d_2021xPleisure	-0.062** (0.023)	-0.034 (0.028)	-0.061*** (0.019)	-0.061 (0.042)	-0.155** (0.053)	-0.068** (0.025)	-0.063*** (0.016)	-0.018 (0.023)	0.130*** (0.036)
d_2021xPbarrest	0.017 (0.017)	-0.014 (0.021)	0.025 (0.019)	-0.009 (0.027)	-0.001 (0.041)	0.014 (0.014)	0.024* (0.013)	-0.026 (0.020)	-0.046 (0.035)
LOS	0.053*** (0.002)	0.054*** (0.005)	0.049*** (0.003)	0.052*** (0.003)	0.072*** (0.009)	0.040*** (0.002)	0.046*** (0.002)	0.039*** (0.003)	0.040*** (0.002)
Package	-0.020 (0.052)	0.060 (0.046)	0.010 (0.056)	0.155*** (0.045)	0.195** (0.079)	-0.042 (0.038)	-0.038 (0.042)	-0.140*** (0.014)	-0.186** (0.075)
Plane	0.323*** (0.064)	0.462*** (0.051)	0.365*** (0.056)	0.170*** (0.041)	0.646*** (0.080)	0.338*** (0.077)	0.551*** (0.063)	0.678*** (0.034)	0.907*** (0.132)
Boat/cruise	0.720*** (0.184)	0.390*** (0.090)	0.150 (0.192)	0.261*** (0.045)	0.302 (0.177)	0.419*** (0.042)	0.601*** (0.151)	0.008 (0.052)	0.296** (0.106)
Train	0.190 (0.145)	0.196*** (0.034)	-0.184 (0.113)	0.249*** (0.065)	0.155 (0.167)	0.155** (0.062)	0.367*** (0.055)	0.580*** (0.036)	0.734*** (0.135)
Other market accom.	-0.034 (0.037)	0.025 (0.029)	-0.041*** (0.013)	-0.043 (0.027)	-0.025 (0.086)	0.033 (0.027)	-0.063** (0.027)	-0.076*** (0.024)	0.014 (0.063)
Non-market accom.	-0.464*** (0.031)	-0.534*** (0.046)	-0.559*** (0.063)	-0.435*** (0.032)	-0.624*** (0.056)	-0.556*** (0.035)	-0.495*** (0.059)	-0.349*** (0.011)	-0.425*** (0.066)
August	-0.016 (0.017)	0.041* (0.023)	-0.036** (0.017)	0.064** (0.028)	-0.076 (0.055)	-0.027 (0.017)	-0.004 (0.010)	0.041*** (0.007)	-0.053* (0.030)
Constant	17.181*** (2.635)	15.190*** (2.673)	15.011*** (2.040)	23.054*** (6.215)	2.944 (5.782)	15.307*** (2.539)	10.769*** (2.354)	12.863*** (1.526)	9.434** (3.267)
Observations	4,425	5,699	2,193	2,680	552	6,279	7,197	2,024	1,247
R-squared	0.725	0.718	0.710	0.724	0.714	0.690	0.666	0.652	0.445

Table 3. Coefficient estimates from OSL regressions, separately per country of origin.

Note: Clustered standard errors at the autonomous community of destination level in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The omitted categories are d_2019, Car/bus, Hotel and July.

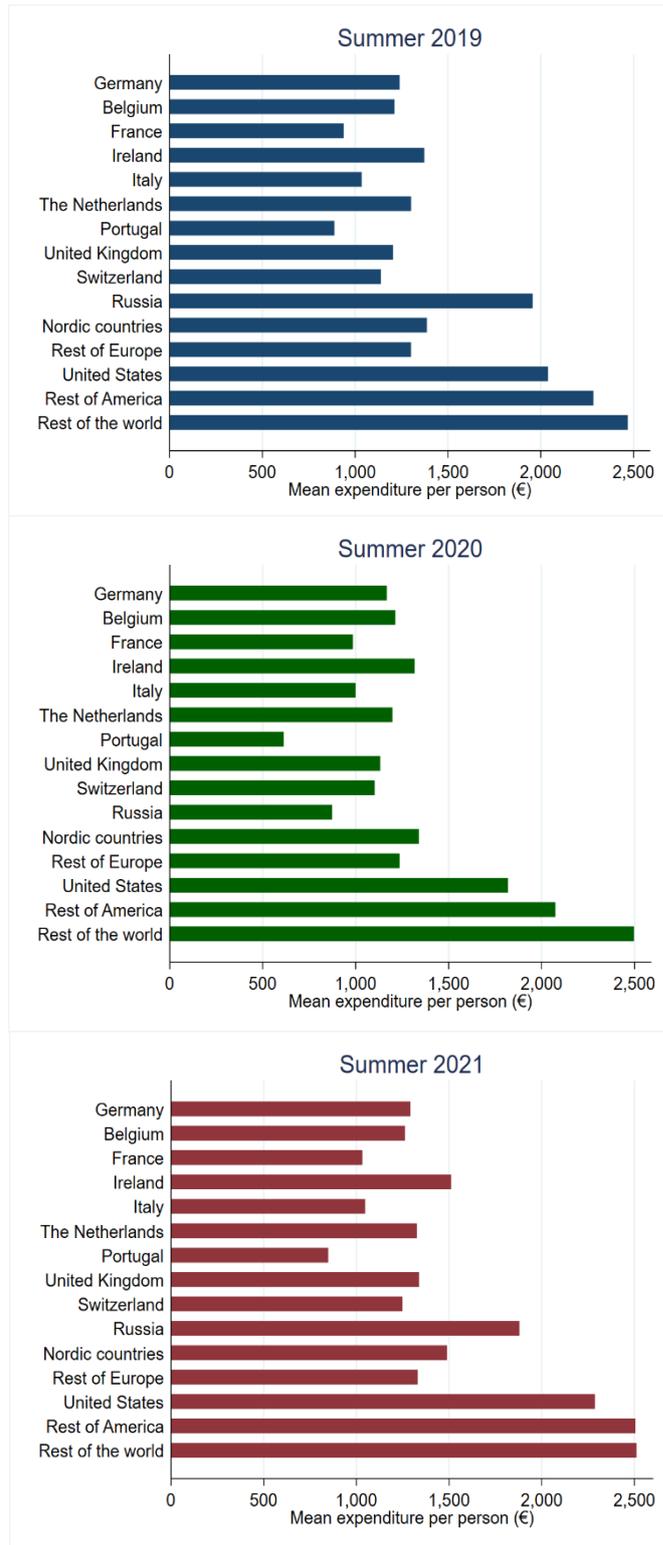


Figure 1. Mean expenditure per person (€) by summer period and country of origin

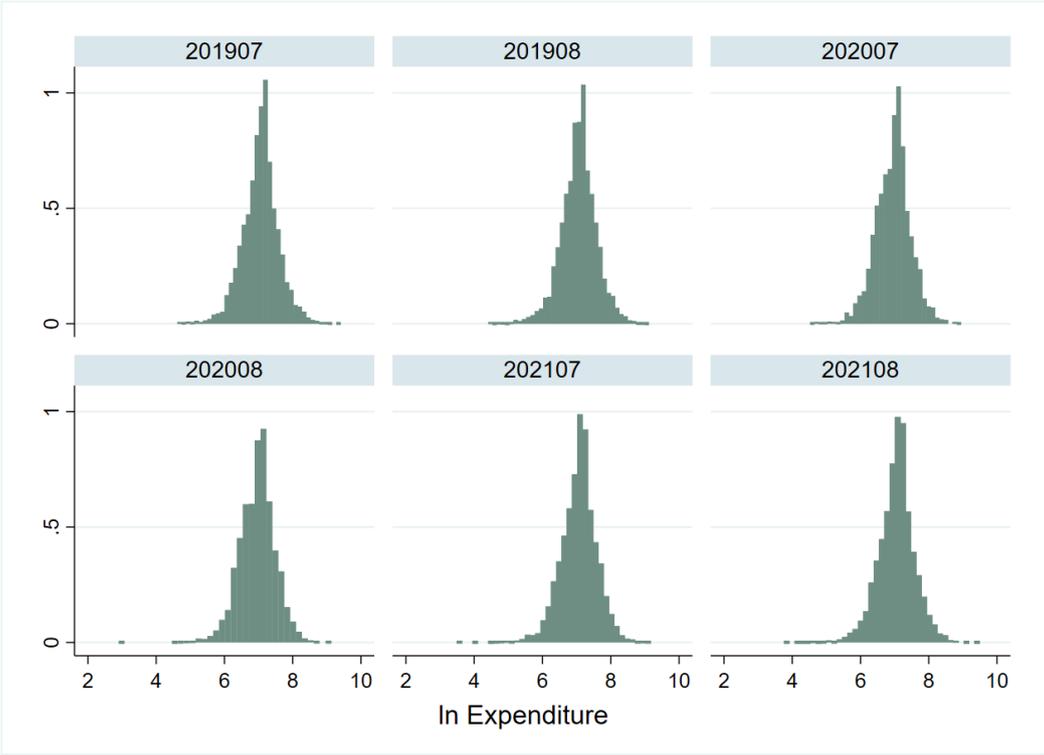


Figure 2. Histogram of ln Expenditure per period

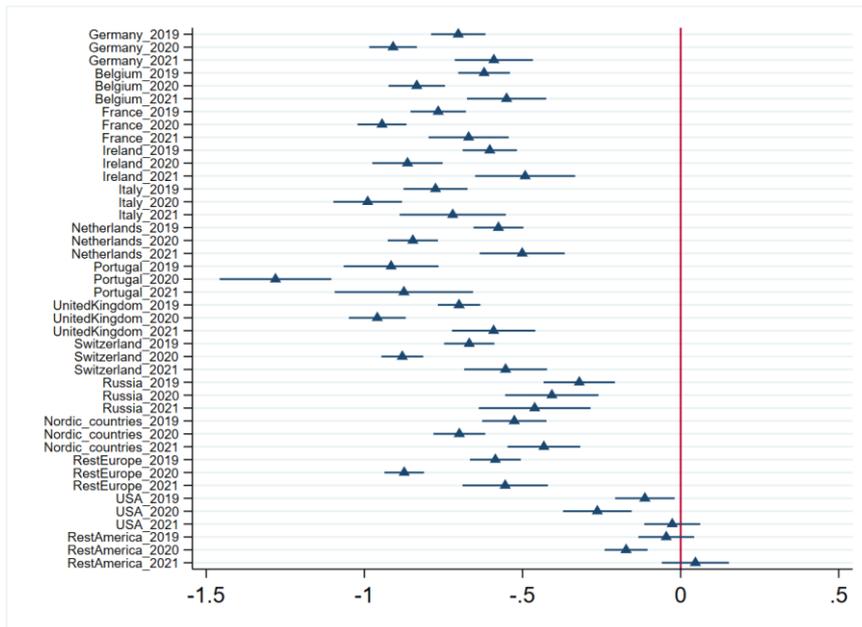


Figure 3. Coefficient estimates for the origin-period fixed effects from the OLS regression

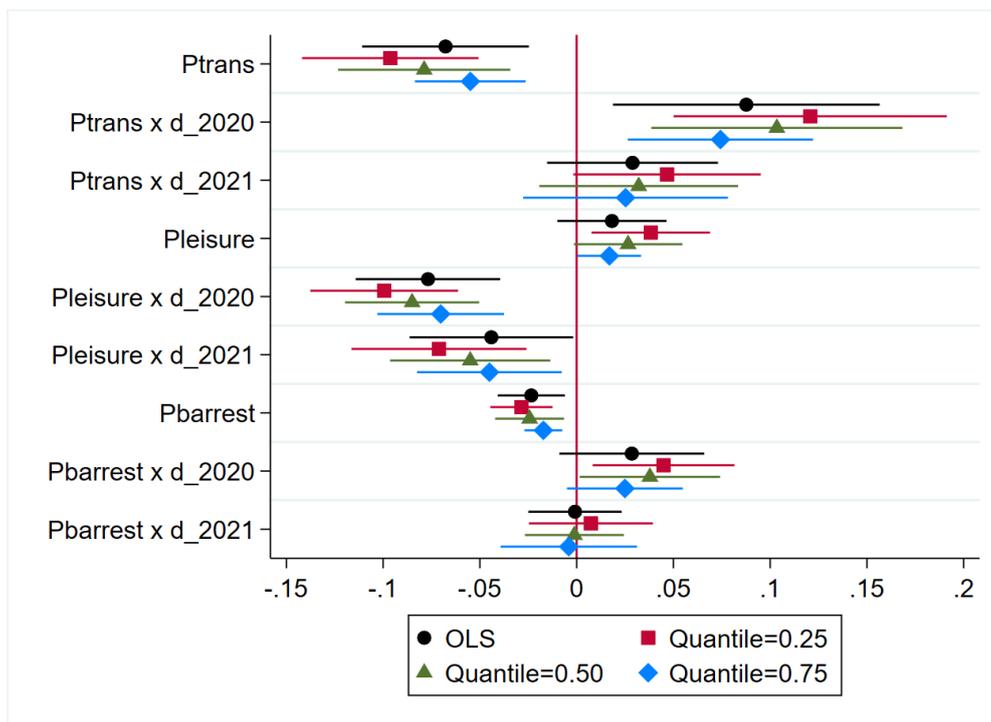


Figure 4. Coefficient estimates and confidence intervals from OLS and quantile regressions