Live Football and Tourism Expenditure: Match Attendance Effects in the UK

Abstract

Research question: We evaluate the inbound tourist expenditure generating role of football (soccer), particularly the English Premier League (EPL). We provide enhanced economic and management understanding of the role of regular sporting fixtures, as well as quantifying their impact. We also analyse the role of expenditure on football tickets to isolate local economic spillovers outside the stadium walls. **Research methods:** Using the UK International Passenger Survey, we employ unconditional quantile regressions (UQR) to evaluate the distributional impact of football attendance on tourist expenditures, using both total expenditure and a new measure which adjusts expenditures for football ticket prices. UQR is a novel technique which is as yet underexploited within tourism economics and confers important methodological advantages over both OLS and quantile regressions. **Results and findings:** We find significant cross quantile variation: high spending football fans spend more even after ticket prices are excluded. Surprisingly, spending effects owing to attendance are strongest for those who overall spend the least, confirming the role of sport as a generator of tourism expenditure unlike most others. Though the attendance effect is smaller for higher aggregate spenders, there is nevertheless a significant impact across the distribution. **Implications:** We find distributional expenditure impacts highlighting clear differentials between attendance by high and low spenders. Our analysis is applicable to other global brands such as the National Football League (NFL) in the United States

(American football) and the Indian Premier (cricket) League. Our analysis demonstrates how EPL?s global popularity can be leveraged for achieving enhanced tourist expenditure.

Keywords: tourist expenditure, football attendance, unconditional quantile regression

JEL Classifications: C5, D1, F61

Introduction

The English Premier League (EPL) for football (soccer) has a global television audience of about 730 million in more than 185 countries (Javid, 2015). Inbound tourism fosters economic growth and generates revenue for the host economy (De Vita and Kyaw, 2016). For the United Kingdom, turning this global interest in football into revenue generating visits by overseas residents for stadium trips has obvious value. An opportunity to exploit spare capacity in the travel sector arises as a result of games taking place during the traditionally low season of tourist demand. Using weighted data from the International Passenger Survey (IPS), the UK Office for National Statistics (ONS) estimate that there were eight hundred thousand trips to the UK that included one football match, or 1 in 43 of all visits (Visit Britain, 2015). To the best of our knowledge, our paper employs this IPS football data for applied research for the first time. Aggregate comparisons show that those tourists who attended matches spent more than those who did not (Visit Britain, 2015). Our consideration of distributional impacts highlights clear differentials between attendance impacts on high and low spenders. Though the attendance effect is smaller for higher aggregate spenders, there is nevertheless a significant impact across the distribution. Deconstructing this effect can inform more effective tourism and sport promotion strategies for the UK. This would allow further economic benefits of football related tourism to be realised for the UK economy and the global reach of the game be successfully exploited.

Our analysis makes three key contributions to enhancing the economic understanding of the role of regular sporting fixtures in the determination of expenditure by inbound tourists. First, to the best of our knowledge, this is the first study assessing the role of the English Premier League

as a driver of inbound tourist spending. Our paper is amongst a handful studies noted above which go beyond the traditional OLS based analysis of the mean within the tourism expenditure literature. Second, our use of unconditional quantile regression method with fixed effects analyses the distributional impacts of any regular sporting fixture for the first time. Finally, we use a new expenditure measure that does not include ticket prices and therefore allows us to assess the influence of sporting fixtures (namely footballing events) on general expenditure flows into the wider UK economy. Using this measure we demonstrate that stadium visits continue to promote greater expenditure at the higher spending quantiles, which is an effect missed out by OLS based analysis as is commonplace in several prior studies. Through inclusion of suitable covariates as controls, and by permitting heterogeneity by region of origin, we demonstrate how football's global popularity can be leveraged by the UK for achieving enhanced tourist expenditure. Whilst our empirical work relates to Britain, our analysis is applicable to other global brands such as the National Football League (NFL) in the United States (American football) and the Indian Premier (cricket) League, in terms of relevance of sporting events in generating tourism expenditures contributing to higher growth overall.

I Literature

Research interest in football in the UK flows from the global reach of the EPL (Javid, 2015) and the linkage between tourism and economic spillovers (De Vita and Kyaw, 2016; Webster and Ivanov, 2014). A number of papers examine the determinants of tourist expenditures, with focus on various econometric methods (Brida and Scuderi, 2013; Marrocu et al., 2015; Rashidi and Koo, 2016; Rudkin and Sharma, 2017; Thrane, 2014). Within the sports tourism literature there is considerable interest in mega events such as the Olympics and the football World Cup (Allan et al., 2017; Burgan and Mules, 1992; Daniels et al., 2004; Kim et al., 2015; Lee and Taylor, 2005; Li and Song, 2013; O'Brien, 2006; Rose and Spiegel, 2011). The potential for economic benefit is explored for smaller scale events where the visitor for a sporting event may

be a participant (Coghlan and Filo, 2013; Whitehead and Wicker, 2018); where the visitor may attend a series of events which draw on local culture (Kelly and Fairley, 2018; Ziakas and Costa, 2011), or, as is studied in this paper, the visitor may be one of the spectators at regular sporting fixtures (Gibson et al., 2003; Whitehead et al., 2013). All inbound tourists are considered, rather than small localised samples, enabling a better understanding of the impact of regular sporting events.

Local impacts from sport are well known from the literature on mega events (Allan et al., 2017; Daniels et al., 2004; Kim et al., 2015) but are less well understood for small scale events where domestic travel is undertaken for viewing regular sporting fixtures (Gibson et al., 2003). The economic impact that arises is captured by the expenditure within a particular locality, as a result of individuals travelling from outside the area. From an income accounting perspective Davies (2002) estimates Sheffield's two football clubs add 20% of the overall income from the commercial sport sector locally[1]. Davis and End (2010) provide a formal economic relationship between winning teams and these resulting local economic spillovers, irrespective of the team being supported by the traveller. Whitehead et al. (2013) view such effects arising from the "happiness" owing to a (positive) sporting result which leads to increased expenditures within the locality. Roberts et al. (2016) case study of the impact of travelling supporters of Swansea City FC, a team that has enjoyed periods within the English Premier League, is a further example of economic assessment from a micro scale; their travellers are domestic as Gibson et al. (2003) but the work identifies many of the benefits international visitors would bring to local businesses around the stadia.

Not all studies of regular sporting fixtures support benefits for local communities. Depken and Stephenson (2018) exploration of hotel demand in the US reveals that although mega-events may bring increased occupancy well ahead, and after, the event regular fixtures do not.

[1]Sheffield has two sides, Sheffield United and Sheffield Wednesday, who have been in the English Premier League within the past twenty years (2007 and 2000 being their most recent relegation years respectively). Awareness of these sides may be higher than others that do not directly feature in the list of grounds provided in the IPS.

Baumann et al. (2009) likewise finds regular fixtures have insignificant effects on hotel usage, in their case using Hawaii.

Our analysis focuses on observed spending levels recognising that there are positive welfare gains, or individual utility enhancements, from the enjoyment of attending live football. Enjoyment can come from event uncertainty as argued by Nalbantis et al. (2017), or how actual results differ from what was expected Coates et al. (2014). Ge (2018) study of tipping behaviour identifies deviation from expected results as being responsible for increased tipping, higher expenditure and increased local impact than expected wins or losses. However, little evidence is found that the precise level of deviation from expectation matters. The consequent economic benefits of increased GDP contributions can be felt both locally by clubs and at the aggregate level of the economy.

Very often match attendance follows from interest in football prior to the match. An emerging literature reviews the impact of broadcasting rights and sports events on intent to travel for tourism (Cox, 2016). Chinese internet users cite the utility they derive from belonging to a football club community developed from their televisual and internet viewing as a motivation to travel to the UK, which is a relationship that holds irrespective of team performance (Peng et al., 2016). Similar themes emerge from the wider study of Japanese sport travel motivations by Nishio et al. (2016). Further travel need not be solely to watch the star sides, many will travel to watch underdogs (Koenigstorfer et al., 2010); impacts will be felt well outside the football hotbeds of London, Manchester and Liverpool. Irrespective of the uncertainty argument the global reach of the game continues to grow and there exists significant potential for successfully targeting non-UK residents to attend UK football matches.

Our analysis speaks directly to the economic impact through expenditure data from the UK IPS, and abstracts from topics where the data is weak. We do not evaluate the social impacts, the views of the local community they interact with, or longer term consequences of inbound visitors on requirements for stadium expansion. Kellison and Hong (2015) provides a useful

review of the environmental impact of modern stadium design. Sports are also evaluated for local sport activity participation, see for example Weed et al. (2015) study of participation in London after the 2012 Olympics.

Analyses of expenditure across tourism, sporting focused or otherwise, have been traditionally OLS driven (see Brida and Scuderi (2013) and Thrane (2014)), including papers analysing sports tourism. In recent years new methodologies have been employed within studies on tourism expenditure and distributional techniques have also become more widely used. Quantile regression (QR) (Koenker and Bassett Jr, 1978) has been increasingly adopted because it allows researchers to study the impact of covariates more effectively, moving away from a focus mainly on the mean. Chen and Chang (2012), Marrocu et al. (2015), and Almeida and Garrod (2017) are amongst those who adopt QR. Santos and Cabral Vieira (2012) compares OLS and quantile regressions to underline the benefits of QR. In all such studies, length of stay, gender, purpose of visit and group size are key determinants and each of these important variables is also included in our analysis.

We then take these common determinants as controls for the role of live football attendance on inbound tourism expenditure.

Data and Methodology

Measures of Expenditure

Our aim is to understand not only the impact that football attendance has on tourist expenditure within the UK, but also to do so across the full expenditure distribution. Expenditure covers all spending during a visit by tourists to the UK, excluding air fares and duty free purchases and is compiled using ONS data. Expenditure is reported for the respondent and includes only amounts that they personally spend whilst in the UK, but spending from other members of the party is excluded. We use the most up-to-date data set available to us that includes questions

on football attendance which is the 2014 IPS dataset dataset (Office for National Statistics, 2015). In this large cohort survey respondents are asked whether they attended any football matches and, if so, which stadia they visited (in addition to trip characteristics and respondent demographics). Just over 1.8% of respondents attended live football, but at more than 1100 observations this represents a large enough sample in absolute terms to enable robust subsequent analysis. Using detailed information on football match attendance and a clearly defined expenditure measure, we are able to evaluate the impact of in stadia match viewing using both the total expenditure and spending excluding estimated expenditure on purchasing match tickets. The latter measure is a new approach to such analysis and we believe it helps in disaggregating effects more clearly (Bi, 2015).

Table 1 details the prices of tickets and the number of attendees at each stadium based on ONS data in our sample. Ticket prices are taken from the football industry supported BBC cost of football survey (BBC, 2014), and ignore corporate pricing options. With no data available on ticket types purchased we assume these countervailing effects balance out and so we use an average of the minimum and maximum ticket price to calculate expenditure[2]. The most visited stadia belong to clubs with the greatest history of success (Manchester United, Liverpool and Arsenal). The major drivers of visits include geography, a sense of community, and interest in and identification with particular football teams (Coates et al., 2014; Peng et al., 2016). As typically successful teams record more wins, they find it easier to sell out their tickets, whereby their stadium capacity constraint is likely to drive prices up. Prices may vary with the quality of the opposition faced, or the league position (ranking) of the team at the time the game is played since this relates to perceived competitiveness of the scheduled match and has a significant impact on viewer interest (Coates et al., 2014). We assume that supporters pay the average "home" price.[3]

[2]For this purpose the BBC use standard seat-only tickets for the stadium. Differentials in price are typically generated by distance to the pitch, height, any structural impediments to view, and so on.

[3]We could further make links between overall expenditure and ticket prices by assuming some degree of proportionality between the two, but such a measure would be as crude as the average approach adopted here.

Table 1 about here

To construct adjusted expenditure we deduct the representative price of one match ticket for each football stadium an individual attends and we then deduct this amount from the reported spend. We only deduct one ticket per stadium visit as expenditure is reported for each individual visit by a respondent. Football seasons run from August until May such that 2014 saw the end of the 2013/14 season and the commencement of the 2014/15 season. We use £25 as an average price for tickets for the division below the EPL, which is taken from BBC (2014). We do not suggest that those who spend more on football would otherwise have come to the UK and used their money to buy other items, nor that all other items would bring equal benefit to the UK economy. Our adjusted measure goes some way towards assuming no substitution of other goods for football. Many tourists travel to the UK solely for attending football (Peng et al., 2016) but we can not identify these respondents individually from the IPS data. The analysis that follows focuses on visitors who come to the UK and attend football matches from the observed IPS set of visitors. We use total expenditure in our analysis as this captures spending within the economy attributable to each visitor.[4]

Data

We include two continuous variables in our analysis and each is reported in logs to mediate impacts of extreme (large) values. Table 2 summarizes the full set of variables we employ. The expenditure information is related to the additional revenue mentioned in Visit Britain (2015). This is also picked up by the two-sample t-test of equality of means that we report in the final column of Table 2. Average expenditure is 5.918 (£372) dropping to 5.914 (£370) when ticket prices are removed, which is a very small change. Football attendees spend more on average than non-attendees. This increase remains significant when we use adjusted expenditure. Stay durations are almost identical, implying football is seldom a reason to extend a trip.

[4]Results based on daily expenditure, as suggested by Sun and Stynes (2006), are presented in the online supplemental note provided.

Table 2 about here

Unsurprisingly, the biggest difference is observed within the gender make up of the two samples. The proportion of males in the football attending group is 77.7% whilst the overall sample is only slightly gender unequal, being 53.9% male. Visitors going to matches are also younger than the general population of tourists, with a higher proportion being under 25 years of age (16.2% in the non-attending group versus 22.3% in the attending set). For age, motivated by the interest in older travellers (Chen and Shoemaker, 2014; Chen and Chen, 2018; Sedgley et al., 2011) we use over 65s as a reference category to highlight the effects of working age and being younger. Requiring a visa does not have a large differential impact. 21.5% of match attendees travel from countries for which a visa is needed to travel to the UK, compared to 22.0% in the full sample.

Purpose of visit is viewed as an important factor in determining expenditure within previous research (Brida and Scuderi, 2013; Thrane, 2014; Marrocu et al., 2015). The IPS includes 28 different purposes reported for travel. We combine these into three categories, holidaying, business travel and longer or family related visits. Almost half of tourists (47.2%) fall under the latter "visitor"category, with this largest purpose grouping then becoming our reference category. When looking at the football sample it is clear that fewer tourists who are in the UK on business attend football than the general population, and a similar conclusion also holds true for those on holiday. Longer stayers, or family visitors, watch significantly more football: 68.5% of attendees fall into this category. These types of visitor are more likely to have affiliations to a team.

Lone travellers are the reference category for group size given they are the most common respondent type comprising 56.4% of the whole sample, but such tourists account for only 49.2% of football attendees. Group size refers to the total number of members in the travelling party irrespective of age. Dummies on larger groups highlight the community effect identified by Cox (2016) and Peng et al. (2016). Relevant factors which influence where people visit

are included as information for these was included within additional questions in the 2014 IPS and these variables have relevance to spending behaviour (Bronner and de Hoog, 2016; Backer et al., 2017). Football attendees are more likely to be influenced by review websites and the traditional media, which is related to creation of virtual communities and creation of interest in sports engendered by broadcasting, as discussed in Peng et al. (2016), Pawlowski et al. (2017) and others.

Table 3 about here

Methodology

Using unconditional quantile regressions (Fortin et al., 2009), our study employs a recent, novel technique which is as yet underexploited within tourism economics. Adoption of UQR over QR has two key benefits. First, the robust nature of UQR to covariate selection (Borah and Basu, 2013) is a clear advantage over QR in a field where choice of explanatory variables is not definitive (Thrane, 2014). Secondly, the two stage approach of transforming the dependent variable, and then running regressions, permits more options to study the role of explanatory factors; the fixed effects format adopted here being one such example. This enables a better understanding of expenditure effects as compared to previous studies involving sporting events. Our methodology draws on the value of studying beyond the mean and, once the benefits of distributional analysis are established, the advantages of UQR over QR

Owing to limitations within the IPS dataset and possible presence of unobserved heterogeneity, we introduce fixed effects for the region from which the visitor travels. Table 3 lists the areas employed in our analysis and shows the proportion of attendees from each region who attend live football events in the UK. Therefore an element of the unobserved heterogeneity within inbound tourists is captured in our analysis. Whilst nationality is described as an important control variable, low attendance numbers mean there is insufficient data to disaggregate the fixed effects at the level of nationality of individuals. These fixed effects are accommodated within the UQR method of Fortin et al. (2009) following Borgen et al. (2016). These regions also provide information on the distances visitors have travelled and the likely cost thereof.

Our main interest is in explaining how attendance at live football f_i, and our chosen covariates, X_i, affect the expenditure, EXP_i of individual i observed within the IPS data. EXP in this paper may be either the unadjusted level UAD or the ticket price adjusted ADJ. To reflect the varying influence of f_i and X_i at quantile τ of EXP we first transform the expenditure variable using

$$\theta\left(EXP, q_\tau, F_{EXP}\right) = q_\tau + \frac{\tau - \mathbb{1}\left(EXP_i \leq q_\tau\right)}{f_Y\left(q_\tau\right)} \tag{1}$$

$\theta\left(EXP, q_\tau, F_{EXP}\right)$ defines the recentered inference function for quantile τ and places greater weighting on the observations closest to that particular quantile. Relative importance of observations is achieved through the indicator function, $\mathbb{1}\left(EXP_i \leq q_\tau\right)$, which takes the value 1 whenever the expenditure of individual i is below the quantile being considered, q_τ. We also have F_{EXP} as the cumulative distribution of expenditure and f_{EXP} as the marginal distribution thereof. At q_τ the marginal distribution of expenditure takes the value $f_{EXP}\left(q_\tau\right)$. The absence of any covariates in equation 1 is what gives UQR it's strength, as it ensures estimates are not conditional on the choice of either X_i or f_i

Using the $\theta\left(Y_i, q_\tau, F_Y\right)$ evaluated for individual i, observed match attendance, f_i, and the associated collection of explanatory variables X_i, we are able to estimate the model. Following Borgen et al. (2016) fixed effects γ_j are also included for region of origin j giving a second stage regression as follows:

$$\theta\left(Y_i, q_\tau, F_Y\right) = \alpha + \phi f_i + \beta_\tau X_i + \gamma_j + \varepsilon_j \tag{2}$$

Our interest is in the impact of live football captured through ϕ, the vector of coefficients β on our selected covariates, and the intercepts α. Error terms ε_j are assumed to be identically independently distributed with mean zero and constant variance within region j. Model estimation using cluster-robust standard errors has been shown to be advantageous given the assumption of unobserved heterogeneity amongst regions. Utilising a two-step process in this way means that it is easier to perform tests on the resulting coefficients. Essentially we have multiple models on the same dataset with different explanatory variables. Our test for parameter equality across two quantiles, τ_1 and τ_2, is simply a test that the β_τ coefficients are the same in a regression

of $\theta(Y_i, q_{\tau,1}, F_Y)$ and $\theta(Y_i, q_{\tau,2}, F_Y)$ on the respective X variables. Because the distribution is the same, the first stage is not altered and the test can be carried out using seemingly unrelated regressions with appropriate centring to account for the fixed effects.

We perform the RIF regression for percentiles of the expenditure distribution from the lowest decile $(\tau = 0.1)$ through to the 90th percentile $(\tau = 0.9)$ at the top end with an increment of 1%. Hence we have 81 sets of coefficients, one for each of the quantiles. For our football attendance dummy the coefficient at each quantile states, ceteris paribus, the effect of attending a football match as part of the visit to the UK. For brevity the tables that follow only report the 10th, 25th, 50th, 75th and 90th percentiles.

We are thus able to address the important questions surrounding football attendance by overseas residents and the economic benefits delivered; we do so across the overall expenditure distribution. A series of robustness checks with alternative specifications are undertaken but no meaningful impact of the coefficients on football attendance is noted. The ability of the IPS dataset to assess football's influence on spending remains strong and we have sufficient covariates to provide a meaningful analysis of drivers of expenditure.

Results

We estimate our model using two different dependent variables, log expenditure adjusted for football ticket prices and the unadjusted log expenditure. Tables 4 and 5 present the coefficients and associated robust standard errors for both OLS estimation and UQR regression at the 10th, 25th, 50th, 75th and 90th percentiles. In so doing we are able to clearly assess what is happening at the extremes of the distribution whilst still highlighting information from around the median. *R*-squared values for the quantiles are typically greater than 0.15, with some variation in the tails; this range is typical for quantile models and especially UQR Fortin et al. (2009). A test for quality of coefficients at all five quantiles is provided in the final column, rejecting the

null hypothesis of parameter equality in almost all cases.[5] The differentials across quantiles are highly noticeable as are striking differences between the UQR coefficients and their OLS counterparts.

The fixed effect OLS models show significant increases in expenditure, but when adjusting for ticket prices this effect becomes smaller and insignificant at the 5% level. Results obtained from OLS regressions show that attendance at live football increases expenditure significantly, consistent with (Visit Britain, 2015). However, when the price of tickets is taken out this result becomes insignificant suggesting that much of the extra benefits of football attending visitors are experienced by the clubs and not driven by higher spending in the wider economy[6]

Table 4 about here

Table 5 about here

Figure 1 about here

Table 4 shows that there are significant impacts at $\tau = 0.75$ and $\tau = 0.9$ with variations across quantiles. When using the unadjusted figures all quantiles are significant, with the highest value observed at $\tau = 0.1$ which is more than twice the OLS value. Plotting these coefficients alongside the other τ values enables us to identify variation in the expenditure increasing effect. Figure 1 illustrates the variation in coefficients clearly using solid lines for UQR and dot-dashed lines for OLS, thick lines for coefficients and thin lines for the 95% confidence interval; differences are particularly apparent in the unadjusted case in panel (b). For adjusted expenditure, significance is clear for almost all $\tau > 0.6$ but the coefficients consistently move around the OLS value. In the unadjusted case a smoother plot appears with greater than average impacts for lower τ values. Some evidence of variation from the OLS confidence interval is also noted. UQR coefficients show that there are significant increases amongst normally high spenders even

[5] We provide tests between each pair of coefficients in the online online supplemental note provided.

[6] Should proportional ticket pricing be considered then the lower end may remain significant but the broader conclusion of insignificance would hold.

when football ticket prices are accounted for. When the dependent variable is total expenditure the live football attendance dummy is significant at each τ level, but the effect is larger at the lower end of the expenditure distribution.

Within the existing literature, length of stay is a common predictor of increased expenditure and our results are also consistent with this finding (Brida and Scuderi, 2013; Thrane, 2014). However, we find a significant difference given that the strength of this relationship is proportional to the quantile within the UQR, with OLS coefficients overstating the importance of duration for the majority of the respondents. Age of the respondent has a stronger impact on lower spenders, a result that could be inferred from the higher spending of seniors with disposable income in Chen and Chen (2018); Sedgley et al. (2011) bringing closer alignment to working age at the upper end of the distribution. For the working age category a coefficient of 0.564 results for adjusted expenditure at the 10th percentile, $\tau = 0.10$, compared with just 0.149 at the median and 0.142 at the 90th percentile. There is little significance in the difference between expenditures for under 25s and the over 65s as might be expected if we allow for interest in the sport across age categories; this has roots in the discussion of Chen and Shoemaker (2014). The number of members in the travel group is significant in reducing expenditure, and this result applies across the distribution. The primary intuition for this result comes from economies of scale in group travel e.g. hotel room sharing. Holidaymakers spend more money, particularly at the lower end of the distribution, compared to longer stayers; business travellers behave likewise. This is as anticipated given those staying longer, or staying with British family, would be more familiar with ways of saving money. Visa requirements to travel to the UK is a new variable included within our analysis and it does have a significant role on both dependent variables when OLS regression is applied. Under UQR we find that it is the upper end that is driving the result. Highly significant increases above $\tau = 0.5$ are found at $\tau = 0.75$ and $\tau = 0.9$. That there are limited impacts at the lower end of the distribution is linked to the cost of visas and the proportion of income represented by visa costs.

A negative coefficient on friends aligns with the work of Backer et al. (2017), as those friends being visited can help their visitors to save money and find ways to economise. Guidebooks promote spending as would be expected and the same is true for review websites. Again our results are consistent with past research focusing on spending influences e.g. Bronner and de Hoog (2016). Tourist boards are able to influence their clients into spending, or saving, as they see fit. An expenditure enhancing role of boards is seen, suggesting the boards are successful in encouraging people to visit more places and consequently spend more. Though the traditional media has been cited as a reason for interest in football, we do not find any significant impact of traditional media on expenditure. However, social media can be used to encourage visitors to spend more, or to attract visitors who would otherwise have spent less had they not learned of specific tourist attractions. Football clearly attracts visitors to the UK and those visitors spend money on other goods and services whilst within the UK. However, what we have shown through our use of UQR is that this broad observation oversimplifies a more complex picture of distributional impact, and the role played by ticket prices in explaining differences in tourist expenditures. It would be naive to treat the promotion of football attendance equally amongst high and low spenders.

Accounting for ticket prices is an important element of determining impact, because as we have shown, the conclusions for lower spenders hinge quite significantly upon this. This result is obtained notwithstanding concerns about the local use of ticket revenue (Bi, 2015) and the negative community effects as highlighted in (Kim et al., 2015). Though the magnitude of the unadjusted effect is larger for low spenders, encouraging attendance by all visitors is broadly good for the economy. Only at the top end of the spending range is there a continued significant positive impact for football attendees that can be seen as something worthwhile to be promoted.

While it is established that mega events can bring positive spillovers for the host economy (Rose and Spiegel, 2011), our analysis shows that the same approach can be applied to regular domestic league games. As a result of the large expense involved in hosting the biggest fixtures

of the sporting calendar, being able to build on regular league encounters is of great benefit both for tourism promotion and wider positive spillovers for the general UK economy. Likewise the occurrence of fixtures in off-peak tourism periods means spare capacity in the sector exists which can be further exploited. Significant roles for social media and review websites in guiding visitors on what to do in the UK are noted, making these good platforms for promotion generally. More established methods of informing tourists, guidebooks and tourist board publications, are also significant in delivering greater expenditure. However, traditional media such as newspapers and television, are found to be insignificant.

Region of Origin

Effective understanding of policy options through which to stimulate football attendance must recognise different characteristics within the intended audience nationalities. By considering regions separately, better understanding of the effect of attendance can be achieved. Owing to comparatively low number of attendees from some regions only those regions with more than one hundred attendees are included in our analysis viz. European Union, Europe but not in the EU (non-EU) and North America. Table 6 summarises the coefficients on attendance at live football dummy, while Table 7 shows the regional parameter equality tests. We offer a full discussion of the results in the online supplemental note provided.

Table 6 about here.

Figure 2 about here.

Table 7 about here.

Differences between regions are clear with North American coefficients being the smallest amongst the three highlighted regions. In the unadjusted figures the differential is not as large, meaning that visitors from North America who attended football spent less additional

money outside the stadium, i.e. within the local economy, than Europeans. Using UQR we find significant differentials between coefficients across the five estimated τs in three of the six cases. Only for North America is no significant variation in the impact of attendance noted. To highlight these variations we plot all four sets of UQR coefficients onto the same axes, leaving off OLS results for clarity. Similar to the full dataset analysis, we use $\tau \in [0.1, 0.9]$. Figure 2 plots only the coefficients from the regional regressions using solid lines for European Union visitors, small dot-dashed for the non-EU European nations and long dot-dashed lines for North Americans. Both plots demonstrate the greater impact of football on visitors who come from countries such as Norway which are not in the European Union. At the median this differential is at its most pronounced, but it disappears as $\tau = 0.9$ is approached. North American visitors behave very similarly to European Union visitors, as shown in both the adjusted and unadjusted plots. However, there is a clear split between the two coefficient series just below the median.

Testing the significance of the difference between the impact of live football on expenditure for the three single region model-pairs we can see that there are significant differences between those European countries which are not members of the European Union, and the EU and North America. No significant differentials are detected between the European Union and North American coefficients, although, as Figure 2 demonstrates, there are some larger gaps between the values just below the median. For the other regions we see notably lower impacts from live football attendance. Aside from a small range at the lower end of the unadjusted expenditure distribution, the impact of attendance is negative.

Conclusions

Football's importance is well established by the size of its broadcast deals, the levels of football related tourism, and strong fan loyalty. Quantifying the economic benefits of global interest, particularly through increased expenditure by inbound tourists, is an important next step to realising the games' potential. Using unconditional quantile regression with region of origin fixed

effects allows us to quantify the impact of live football on UK inbound tourist expenditures. While football generates significant revenues and expenditures fromfollowers, such financial flows vary across the distribution of total expenditures incurred by tourists. Higher spending attendees continue to spend significantly more than otherwise identical individuals who do not attend football matches. High ticket prices, international ownership of clubs and a desire to understand the wider local impact motivate our use of an adjusted expenditure variable which accounts for ticket prices and offers a better measure of economic impact. Under the adjusted measure it is higher spenders where football has the greatest impact on tourist expenditures. Consequently expenditure variables within our analysis provide a useful new perspective that both extends previous research on football as a tourism driver and enables us to better quantify its impact. Our conclusions are qualified by the recognition that there is no income data available within the IPS, but with the use of regional fixed effects and robustness checks for our ticket price assumption, we are confident about the generalisability of our results.

Benefits from footballing events spread beyond the stadium walls into the wider community, particularly at the top end of the spending distribution. Future work is required to evaluate the geographic extent of the spillovers as the IPS data does not allow us to assess where attendees spend their non-football related funds. Our analysis formally identifies impacts at the aggregate level for the UK economy. Capacity constraints mean visitors often buy tickets at the expense of local supporters, whilst a sense of identity can be diluted reducing the attractiveness of the event that brings in the visitors. Notwithstanding these concerns, we have shown that carefully thought out promotion, supplementing traditional media, can enhance inbound tourist numbers by generating additional interest in attendance at live football events in the UK. Spillovers to the UK economy arise, as shown by positive coefficients of adjusted expenditure, and these spread over the entire football season. There is significant benefit from creating demand in a low season period for the tourism industry and for the wider economy. Our conclusions are drawn from tourists who have already made the decision to come to the UK. However, to evaluate

the net benefits of promoting football attendance it would be beneficial to study the choice to travel to the UK in the first place. Only once it is established that football brings visitors who would not otherwise travel can the full potential of the game in enhancing tourist expenditures be understood.

Our research makes three important contributions to the literature. First, we provide detailed analysis of the role of sporting events in general and the English Premier League in particular for generating growth by promoting inbound tourist expenditures using the UK IPS data. Our paper is the first study to address this research gap. Second, we demonstrate significant methodological improvements through our use of unconditional quantile regression analysis, which provides more robust results as compared to the simple application of OLS, as has been frequently done previously, or use of conditional quantile regression. Use of UQR enables assessment of the distributional impacts of any regular sporting events, such as UK EPL football matches considered here, on tourist expenditures across the spending distribution. Finally, we make use of a more appropriate expenditure variable which is adjusted for ticket prices. This approach enables us to better assess the impact of live football on general expenditure and thus to better understand the expenditure flows into the UK economy. The implications of our study for other nations and other sports, as well as for social science research, are clear especially in relation to the methodological enhancements we demonstrate that are highly applicable to other, related contexts. Our econometric analysis signposts promotional opportunities that can help realise football's potential in enhancing tourist flows, increasing tourist expenditures and generating growth within the economy.

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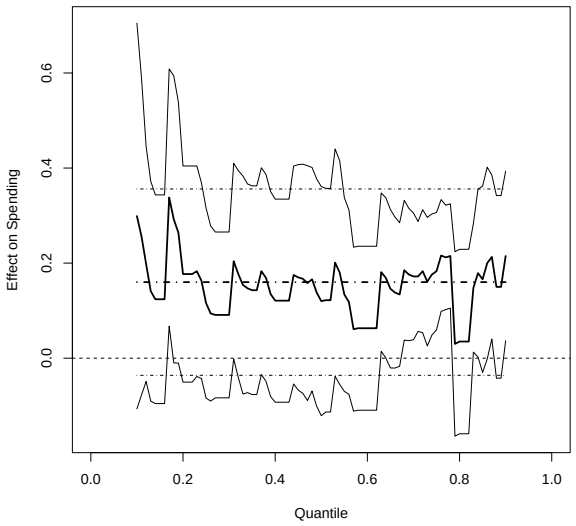
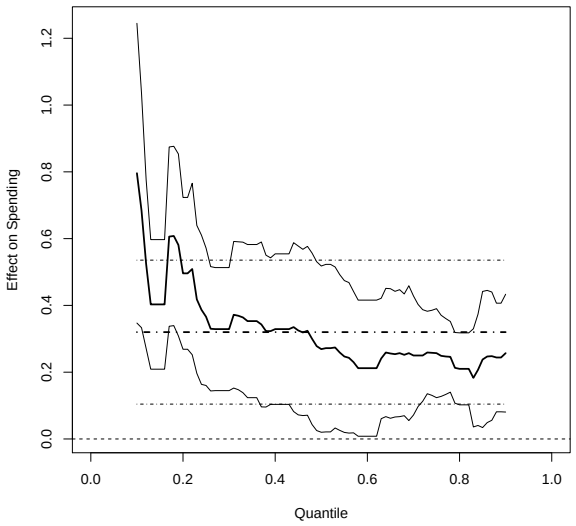
Figure 1: Impact of Live Football Attendance on UK Inbound Visitor Expenditure



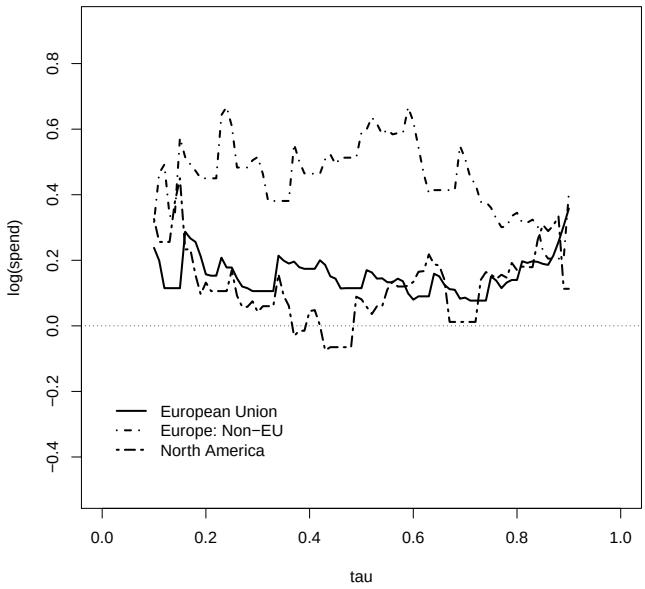
Panel (a) Adjusted expenditure



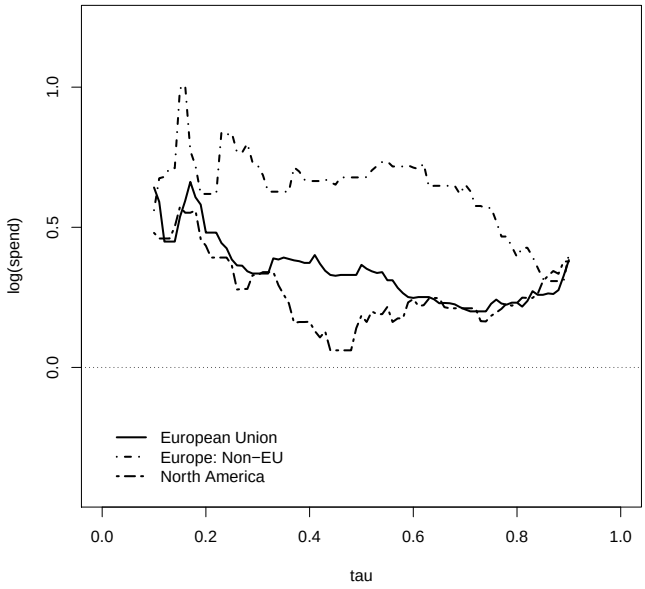
Panel (b) Unadjusted expenditure

Notes: Top panel displays ticket price adjusted expenditure. Lower panel shows the total expenditure recorded for each visitor. 95% confidence intervals are plotted as dotted lines for the UQR. OLS coefficients are plotted using a dot-dash line, with corresponding 95% confidence intervals drawn as dotted lines

Figure 2: Impact of Live Football Attendance on UK Inbound Visitor Expenditure by Region



Panel (a) Adjusted expenditure



Panel (b) Unadjusted expenditure

Notes: Left panel displays ticket price adjusted expenditure. Right panel shows the unadjusted expenditure recorded for each visitor. Confidence intervals and OLS coefficients are omitted for clarity.

Table 1: Minimum, Maximum and Average Prices of Football

Stadium	Club	City	Region	Respondent Count	Price Information		
					Minimum (£)	Maximum (£)	Average (£)
Wembley	National	London	South East	73	50	50	50
Millenium Stadium	National	Cardiff	Wales	7	40	40	40
Hampden Park	National	Glasgow	Scotland	6	40	40	40
Windsor Park	National	Belfast	N. Ireland	3	40	40	40
Emirates Stadium	Arsenal	London	South East	140	27	97	62
Villa Park	Aston Villa	Birmingham	Midlands	18	22	45	35.5
Cardiff City Stadium	Cardiff City	Cardiff	Wales	9	18	40	29
Stamford Bridge	Chelsea	London	South East	118	50	87	68.5
Selhurst Park	Crystal Palace	London	South East	16	30	40	35
Goodison Park	Everton	Liverpool	North West	30	33	47	40
Craven Cottage	Fulham	London	South East	37	25	45	35
KC Stadium	Hull City	Hull	North East	5	16	50	33
Anfield	Liverpool	Liverpool	North West	153	37	59	48
Etihad Stadium	Manchester City	Manchester	North West	54	37	58	47.5
Old Trafford	Manchester United	Manchester	North West	165	36	58	47
St James Park	Newcastle United	Newcastle	North East	20	15	52	33.5
Carrow Road	Norwich City	Norwich	East Anglia	11	25	40	32.5
St Mary's Stadium	Southampton	Southampton	South	12	32	52	42
Britannia Stadium	Stoke City	Stoke	Midlands	3	25	50	37.5
Stadium of Light	Sunderland	Sunderland	North East	9	25	40	32.5
Liberty Stadium	Swansea City	Swansea	Wales	4	35	45	40
White Hart Lane	Tottenham	London	South East	11	32	81	56.5
The Hawthorns	West Brom	West Bromwich	Midlands	3	25	39	42
Boelyn Ground	West Ham	London	South East	27	20	75	47.5
Pittodrie	Aberdeen	Aberdeen	Scotland	5	24	30	27
Celtic Park	Celtic	Glasgow	Scotland	11	23	34	28.5
Tannadice	Dundee United	Dundee	Scotland	0	19	25	22
Tynecastle	Hearts	Edinburgh	Scotland	0	17	30	23.5
Easter Road	Hibernian	Edinburgh	Scotland	0	22	28	25
Caledonian Stadium	Caley Thistle	Inverness	Scotland	1	16	30	23
Rugby Park	Kilmarnock	Kilmarnock	Scotland	0	17	26	21.5
Fir Park	Partick Thistle	Glasgow	Scotland	0	22	25	23.5
Fir Hill	Motherwell	Motherwell	Scotland	2	22	25	23.5
Global Energy Stadium	Ross County	Dingwall	Scotland	1	20	26	23
McDairmid Park	St Johnstone	Perth	Scotland	1	22	23	22.5
St Mirren Stadium	St Mirren	Glasgow	Scotland	23	20	22	21
Other				185	25	25	25
Total				1163			

Notes: All data is sourced from the BBC Cost of Football Survey 2014 (BBC, 2014), whilst averages are computed using own calculations. Maximums are for standard seats and do not include corporate hospitality. Where a team changed divisions the price used remains that given in the survey. In the case of the national stadia there is large variation in prices and so the numbers used are averaged based on prices at a typical game at the venue. West Brom is used as shorthand for West Bromwich Albion and Caley Thistle is used in place of Inverness Caledonian Thistle. 1163 is the total number of stadium visits and not the number of travellers since one traveller may visit multiple stadia.

Table 2: Summary statistics

Variable	Mean	Std Dev	Min	Max	Attend Football?		
					No	Yes	Difference
Log expenditure	5.918	1.264	0	11.80	5.911	6.167	0.257^{***}
Log expenditure (adjusted)	5.914	1.268	0	11.801	5.911	6.006	0.095^{*}
Length of stay (log)	1.573	0.982	0	5.892	1.572	1.600	0.029
Attend live football	0.028	0.166	0	1	-	-	-
Air departures	0.832	0.374	0	1	0.829	0.932	0.103^{***}
Male	0.546	0.498	0	1	0.539	0.777	0.238^{***}
Aged under 25	0.164	0.370	0	1	0.162	0.223	0.061^{***}
Aged 25 to 64	0.760	0.427	0	1	0.760	0.740	-0.020
Aged 65 and over	0.075	0.264	0	1	0.076	0.036	-0.040^{***}
Purpose: Holiday	0.382	0.486	0	1	0.385	0.282	-0.103^{***}
Purpose: Business	0.180	0.384	0	1	0.184	0.039	-0.145^{***}
Purpose: Visit	0.438	0.496	0	1	0.431	0.679	0.248^{***}
Require visa	0.220	0.414	0	1	0.220	0.215	-0.005
Group size: 1	0.564	0.496	0	1	0.566	0.486	-0.080^{***}
Group size: 2	0.271	0.444	0	1	0.270	0.300	0.030^{*}
Group size: 3	0.166	0.372	0	1	0.164	0.214	0.049^{***}
Influence: Friends	0.380	0.485	0	1	0.379	0.395	0.016
Influence: Guidebook	0.078	0.267	0	1	0.078	0.076	-0.002
Influence: Review sites	0.071	0.256	0	1	0.070	0.088	0.018^{*}
Influence: Tourist board	0.029	0.169	0	1	0.030	0.024	-0.006
Influence: Media	0.018	0.134	0	1	0.018	0.029	0.011^{**}
Influence: Social media	0.031	0.173	0	1	0.031	0.033	0.002

Notes: Summary statistics are reported for the 39,515 observations for which a complete set of information was available. We additionally report means for those who do not attend live football, "No", and those who did attend one or more matches, "Yes". The difference between means and significance from a two-sample t-test of mean equality are reported. For the latter significance is denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$. Data from Office for National Statistics (2015).

Table 3: Region of Origin and Football Attendance

Region	Attend?		Total	Region	Attend?		Total
	No	Yes			No	Yes	
North America	5437	112	5549	Europe: Non-EU	4992	210	5202
Central America	112	3	115	Indian Subcontinent	1026	6	1032
South America	694	11	705	East Asia and China	1854	48	1902
Africa	953	16	969	Australasia	1742	57	1799
Middle East	955	40	995	Other	4554	170	4724
European Union	16087	446	16533	Total	38406	1119	39525

Regions are calculated by first generating dummies for each of the nation codes that are included within the data. There are also a number of respondents for whom residence is an overseas British territory and these fall within the other category.

Table 4: Unconditional Quantile Regression Estimates for UK Inbound Expenditures: Adjusted Expenditure

Variable	Football ticket adjusted expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.522***	0.664***	0.424***	0.496***	0.602***	0.673***	102.82***
	(0.028)	(0.050)	(0.026)	(0.043)	(0.041)	(0.084)	
Attend live football	0.162	0.299	0.116	0.120	0.183**	0.215**	29.506***
	(0.103)	(0.207)	(0.102)	(0.123)	(0.063)	(0.091)	
Air departure	0.556**	1.565*	0.582**	0.536***	0.332**	0.170**	560.08***
	(0.214)	(0.779)	(0.188)	(0.114)	(0.130)	(0.054)	
Male	0.100**	0.099	0.084**	0.117***	0.153***	0.122**	12.974*
	(0.032)	(0.068)	(0.030)	(0.022)	(0.042)	(0.045)	
Aged under 25	-0.023	0.065	-0.071	-0.182***	-0.152*	0.009	69.189***
	(0.059)	(0.139)	(0.041)	(0.044)	(0.071)	(0.065)	
Aged 25 to 64	0.226***	0.564***	0.208***	0.149***	0.134**	0.142**	53.424***
	(0.056)	(0.160)	(0.050)	(0.035)	(0.053)	(0.050)	
Purpose: Holiday	0.474***	1.346***	0.644***	0.472***	0.247*	0.061	103.54***
	(0.042)	(0.144)	(0.078)	(0.035)	(0.120)	(0.098)	
Purpose: Business	0.332**	0.189	0.336**	0.455***	0.536**	0.371**	25.213***
	(0.147)	(0.455)	(0.117)	(0.091)	(0.171)	(0.119)	
Require visa	0.428**	0.361	0.205	0.351**	0.707***	0.808**	155.93***
	(0.136)	(0.320)	(0.121)	(0.117)	(0.144)	(0.278)	
Group size: 2	-0.220***	-0.252**	-0.229***	-0.224***	-0.287***	-0.370***	31.098***
	(0.020)	(0.086)	(0.027)	(0.019)	(0.036)	(0.075)	
Group size: 3 or more	-0.382***	-0.380***	-0.445***	-0.440***	-0.514***	-0.525***	9.472
	(0.026)	(0.091)	(0.059)	(0.040)	(0.050)	(0.118)	
Influence: Friends	-0.181***	-0.004	-0.153*	-0.213***	-0.237***	-0.277***	79.960***
	(0.049)	(0.129)	(0.081)	(0.058)	(0.045)	(0.079)	
Influence: Guidebook	0.108***	0.255***	0.162***	0.131***	0.080	0.067	22.768***
	(0.032)	(0.034)	(0.020)	(0.030)	(0.052)	(0.090)	
Influence: Review sites	0.133***	0.181***	0.146***	0.137***	0.118***	0.135*	1.783
	(0.022)	(0.054)	(0.026)	(0.019)	(0.026)	(0.062)	
Influence: Tourist board	0.183***	0.189*	0.122***	0.259***	0.281***	0.036	45.098***
	(0.033)	(0.096)	(0.031)	(0.064)	(0.056)	(0.125)	
Influence: Media	0.050	-0.016	0.039	0.042	0.112	0.145*	5.890
	(0.059)	(0.148)	(0.043)	(0.069)	(0.070)	(0.072)	
Influence: Social media	0.155***	0.331***	0.105**	0.096***	0.168***	0.277***	47.704***
	(0.018)	(0.095)	(0.034)	(0.019)	(0.037)	(0.086)	
Observations	39,525	39,525	39,525	39,525	39,525	39,525	
R-squared	0.233	0.068	0.144	0.189	0.173	0.120	

Notes: *OLS* provides coefficients estimated with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table 5: Unconditional Quantile Regression Estimates for UK Inbound Expenditures: Unadjusted Expenditure

Variable	Unadjusted expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.519***	0.664***	0.420***	0.491***	0.600***	0.675***	55.414
	(0.028)	(0.052)	(0.026)	(0.043)	(0.041)	(0.084)	
Attend live football	0.324**	0.796***	0.366***	0.269*	0.257***	0.257**	55.516***
	(0.107)	(0.229)	(0.105)	(0.127)	(0.068)	(0.090)	
Air departure	0.555**	1.589*	0.585**	0.533***	0.331**	0.167**	3696.6***
	(0.214)	(0.789)	(0.188)	(0.114)	(0.130)	(0.054)	
Male	0.099**	0.101	0.084**	0.118***	0.155***	0.119**	11.376*
	(0.032)	(0.066)	(0.030)	(0.022)	(0.042)	(0.044)	
Aged under 25	-0.022	0.086	-0.072	-0.184***	-0.150*	0.011	33.015***
	(0.060)	(0.142)	(0.040)	(0.046)	(0.072)	(0.066)	
Aged 25 to 64	0.226***	0.570***	0.207***	0.146***	0.134**	0.143**	65.553***
	(0.056)	(0.161)	(0.051)	(0.036)	(0.053)	(0.051)	
Purpose: Holiday	0.471***	1.353***	0.642***	0.464***	0.246*	0.060	262.11***
	(0.043)	(0.145)	(0.078)	(0.034)	(0.118)	(0.099)	
Purpose: Business	0.330**	0.191	0.331**	0.450***	0.533**	0.375**	147.60
	(0.147)	(0.459)	(0.116)	(0.091)	(0.170)	(0.121)	
Require visa	0.428**	0.370	0.202	0.344**	0.706***	0.810**	133.18***
	(0.136)	(0.327)	(0.126)	(0.115)	(0.142)	(0.282)	
Group size: 2	-0.218***	-0.244**	-0.226***	-0.223***	-0.289***	-0.370***	18.106**
	(0.020)	(0.089)	(0.026)	(0.020)	(0.036)	(0.074)	
Group size: 3 or more	-0.378***	-0.379***	-0.447***	-0.437***	-0.514***	-0.529***	9.015
	(0.026)	(0.093)	(0.060)	(0.043)	(0.049)	(0.118)	
Influence: Friends	-0.181***	0.000	-0.152*	-0.210***	-0.235***	-0.278***	140.27***
	(0.049)	(0.130)	(0.080)	(0.058)	(0.045)	(0.079)	
Influence: Guidebook	0.108***	0.265***	0.157***	0.131***	0.080	0.065	8.481
	(0.032)	(0.033)	(0.019)	(0.029)	(0.053)	(0.090)	
Influence: Review sites	0.133***	0.179***	0.144***	0.137***	0.117***	0.135*	10.537*
	(0.022)	(0.054)	(0.028)	(0.018)	(0.025)	(0.062)	
Influence: Tourist board	0.182***	0.200*	0.124***	0.253***	0.279***	0.040	44.412***
	(0.033)	(0.103)	(0.030)	(0.064)	(0.055)	(0.126)	
Influence: Media	0.048	-0.015	0.029	0.047	0.109	0.138*	1.540
	(0.058)	(0.157)	(0.043)	(0.075)	(0.070)	(0.073)	
Influence: Social media	0.155***	0.334***	0.106**	0.100***	0.165***	0.275***	3.397
	(0.018)	(0.099)	(0.035)	(0.018)	(0.038)	(0.086)	
Constant	4.236***	0.954	3.779***	4.505***	5.210***	6.023***	
	(0.202)	(0.674)	(0.147)	(0.101)	(0.214)	(0.201)	
Observations	39,525	39,525	39,525	39,525	39,525	39,525	
R-squared	0.233	0.068	0.144	0.190	0.173	0.121	

Notes: *OLS* provides coefficients estimated with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table 6: Unconditional Quantile Regression Estimates for UK Inbound Expenditure: Adjusted Expenditure

Expenditure	Region	Total expenditure						Equality
		OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Adjusted Expenditure	EU	0.181***	0.238**	0.178***	0.115***	0.151***	0.358***	12.52*
		(0.049)	(0.104)	(0.060)	(0.043)	(0.042)	(0.082)	
	Non-EU	0.459***	0.317*	0.609***	0.590***	0.360***	0.405***	7.542
		(0.069)	(0.185)	(0.122)	(0.092)	(0.100)	(0.125)	
	North America	0.181	0.326*	0.170	0.081	0.157	0.113	1.818
		(0.111)	(0.191)	(0.164)	(0.126)	(0.114)	(0.161)	
Unadjusted Expenditure	EU	0.394***	0.642***	0.385***	0.366***	0.227***	0.383***	36.80***
		(0.039)	(0.070)	(0.054)	(0.042)	(0.044)	(0.083)	
	Non-EU	0.607***	0.561***	0.837***	0.678***	0.570***	0.404***	9.661*
		(0.061)	(0.124)	(0.102)	(0.091)	(0.104)	(0.125)	
	North America	0.305***	0.480***	0.364**	0.185	0.184	0.378**	5.411
		(0.099)	(0.161)	(0.151)	(0.123)	(0.113)	(0.175)	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table 7: Regional parameter equality tests

	Region 1	Region 2	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$
Adjusted Expenditure	Europe (EU)	Europe: Non-EU	0.278^{***}	0.079	0.178^{**}	0.475^{***}	0.209^{*}	0.048
	EU	North America	-0.000	0.088	-0.009	-0.034	0.006	-0.245
	Non-EU	North America	-0.278^{*}	0.009	-0.439^{*}	-0.509^{**}	-0.202	-0.292
Unadjusted Expenditure	EU	Non-EU	0.213^{**}	-0.081	0.452^{***}	0.313^{***}	0.343^{***}	0.021
	EU	North America	-0.089	-0.162	-0.021	-0.181	-0.043	-0.005
	Non-EU	North America	-0.302^{*}	-0.081	-0.473^{*}	-0.493^{**}	-0.386^{**}	-0.026

Notes: *OLS* provides tests based upon OLS regression with robust standard errors. τ denotes the regression quantile at which the coefficient equality is tested. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

ONLINE SUPPLEMENTAL FILE FOR:

Live Football and Tourism Expenditure:

Match Attendance Effects in the UK

Table A1: Monthly football attendance numbers

Month	Football	Total	Football (%)	Month	Football	Total	Football (%)
January	141	3317	4.25	July	7	3695	0.19
February	110	2784	3.95	August	80	3400	2.35
March	152	3080	4.94	September	86	3280	2.62
April	145	3534	4.10	October	78	3174	2.46
May	64	3455	1.85	November	126	3285	3.84
June	12	3785	0.32	December	118	2736	4.31
Total	624	19955		Total	495	19570	

Notes: Football % provides the percentage of all departing passengers who attended live football by the month that they departed.

ONLINE ANNEXE

A Further Breakdown of Attendance

Within the data there is the potential to understand even more about the patterns of behaviour amongst football attendees. In this appendix we present a series of tables and charts to help understand the impact that football has upon inbound tourist expenditure behaviour.

A Month of Visit

It is implicit within the discussion of regular sporting fixtures that they take place throughout the year. Football is noted in the United Kingdom for running between August and May, a period which is predominantly off-season in tourism terms. Using the data we construct Table A1 see that this holds for the 2014 data. Most visitors come either in the holiday period around December and January or in March and April when the season is nearing it's climax. This breakdown is consistent with the past works that cited excitement and importance as being important to attendance; it is also demonstrative that regular sporting fixtures do dissipate travel across quiet times. The peak month for departures in the data is June closely followed by July, these months have very few attendees and no scheduled fixtures[1].

[1]We must acknowledge that there will be travellers leaving in June or July who have viewed international games or who were in the United Kingdom during the football season. We do not have data on when the game they attended actually was.

B Stadia and Nationality

A second interesting consideration is the origin of the supporters attending each of the stadia. Although we do not have the data to test for motivations behind particular combinations it is still instructive to see where the respondents were travelling from. In this data there are some patterns such as those from East Asia being focused on Old Trafford, 13 of the 50 being to see Manchester United and 9 at Arsenal Emirates stadium being the highest amount. Australasian visitors focus on London clubs, Arsenal, Chelsea and Tottenham Hotspur the main attractions. Perhaps unsurprisingly the majority of visitors from the Middle East go to the Emirates airlines sponsored stadium of Arsenal, but numbers reporting visiting the Etihad airlines sponsored ground of Manchester City. Visitors from North America focus on London also, but here we also see 10 attending Fulham[2]. From Table A2 we can see that for the least commonly visited stadia other features heavily, this is because the other category features UK nationals who are no longer resident in the United Kingdom. Our results are accurate but taking deep inference from what has been presented should be avoided.

B Full Results for Coefficient Tests

We present the full set of parameter equality tests here for both the adjusted and total expenditure cases. Table A3 provides all of the chi-squared values for each pairwise combination of τ values in the main paper; $\tau \in \{0.1, 0.25, 0.5, 0.75, 0.9\}$. The final column, *All*, reports the joint hypothesis that all of the coefficients for that variable are equal for the five τ levels. As noted in the main paper there is clear significance in almost all of the aggregate tests.

For the adjusted case the length of stay, being in the under 25 age group and travelling to the UK as a holidaymaker have significant differentials between many of the pairs of τ levels. Being influenced in the places visited by the guidebook makes a big difference at the lower expenditure quantiles with a much stronger similarity noted further up the distribution. When we do not adjust for the football ticket component similar patterns emerge but critically the live football variable is now showing significant difference between the lower τ levels and the higher outcomes. The influence

[2]This may be linked to the regular featuring of American players within the Fulham team, such as Clint Dempsey, but we can not test that with the data we have.

Table A2: Regional breakdown per stadium

Stadium	Club	NA	CA	SA	EU	NE	ME	AF	IN	EA	AA	Other	Total
Wembley	National	19	0	1	22	5	4	2	0	2	5	13	73
Millenium Stadium	National	2	0	1	1	0	0	0	0	1	1	1	7
Hampden Park	National	3	0	0	1	0	0	0	0	0	1	1	6
Windsor Park	National	0	0	0	1	0	0	0	0	1	1	0	3
Emirates Stadium	Arsenal	16	0	2	55	24	13	5	1	9	5	10	140
Villa Park	Aston Villa	2	0	0	6	1	1	0	1	1	1	5	18
Cardiff City	Cardiff City	1	0	0	2	2	1	1	0	0	0	2	9
Stamford Bridge	Chelsea	12	1	1	47	25	8	2	2	5	7	8	118
Selhurst Park	Crystal Palace	4	0	1	6	1	1	0	0	0	0	3	16
Goodison Park	Everton	2	0	0	12	5	1	0	0	0	2	8	30
Craven Cottage	Fulham	10	0	1	12	4	1	0	0	1	2	6	37
KC Stadium	Hull City	0	0	0	2	0	0	0	0	2	0	1	5
Anfield	Liverpool	6	0	0	71	47	3	3	0	6	4	13	153
Etihad Stadium	Manchester City	7	0	0	28	4	3	1	0	3	1	7	54
Old Trafford	Manchester United	8	0	0	70	45	4	2	2	13	4	15	163
St James Park	Newcastle United	1	0	0	9	4	1	0	0	0	0	5	20
Carrow Road	Norwich City	0	1	0	5	1	0	0	0	1	3	0	11
St Mary's Stadium	Southampton	0	0	0	4	1	0	0	0	0	2	5	12
Britannia Stadium	Stoke City	1	1	0	0	0	0	0	0	0	0	1	3
Stadium of Light	Sunderland	0	0	0	4	1	0	0	0	0	2	2	9
Liberty Stadium	Swansea City	0	0	0	3	0	0	0	0	0	1	0	4
White Hart Lane	Tottenham Hotspur	7	1	0	16	13	2	0	0	1	5	9	54
The Hawthorns	West Brom	1	0	0	0	1	0	0	0	0	1	0	3
Boelyn Ground	West Ham	4	1	0	11	8	0	0	0	0	0	3	27
Pittodrie	Aberdeen	1	0	0	3	0	0	0	0	0	0	1	5
Celtic Park	Celtic	2	0	0	2	0	0	0	0	0	1	6	11
Caledonian Stadium	Caley Thistle	0	0	0	0	0	0	0	0	0	0	1	1
Fir Hill	Motherwell	0	0	0	1	0	0	0	0	0	0	1	2
Global Energy Stadium	Ross County	0	0	0	0	0	0	0	0	0	0	1	1
McDairmid Park	St Johnstone	1	0	0	0	0	0	0	0	0	0	0	1
St Mirren Stadium	St Mirren	2	0	0	7	6	1	0	0	0	1	6	23
Other		18	0	4	61	26	5	1	0	4	19	47	185
Total		129	5	11	462	224	49	17	6	50	69	180	1202

Notes: All data is sourced from Office for National Statistics (2015). Attendance numbers are based on all trips and do not assume that the ground visited was the main destination for the traveller. West Brom is used to represent West Bromwich Albion and Caley Thistle is used in place of Inverness Caledonian Thistle. Codes for the regions are as follows: NA - North America, CA - Central America, SA - South America, EU - European Union, NE - Europe but not in the European Union, ME - Middle East, AF - Africa, IN - Indian subcontinent, EA - East Asia, AA - Australasia, Other includes British nationals who now live overseas.

of friends, relatives or colleagues creates bigger differentials between the coefficients amongst lower spending visitors, and the influence of the guidebook does likewise. Apart from these two differences there are few other significant pairings to be seen in Table A3.

Benefits from using a distributional approach are clear from these results, with a large number of these tests revealing significance. However, the majority of pairings do not produce significant change meaning that there is still a stability to the relationships between the explanatory variables and inbound tourist expenditure. Graphical representations, like those of Figure 1 in the main paper demonstrate this well. From this we conclude that it remains desirable to continue with a quantile approach rather than a mean based method like OLS.

Variable	$\tau = 0.1$				$\tau = 0.25$			$\tau = 0.5$
Against	$\tau = 0.25$	$\tau = 0.5$	$\tau = 0.75$	$\tau = 0.9$	$\tau = 0.5$	$\tau = 0.75$	$\tau = 0.9$	$\tau = 0.75$
Adjusted Expenditure:								
Length of stay	29.538***	7.583**	1.930	0.010	9.572**	18.482***	6.922**	3.822
Attend live soccer	2.554	2.023	0.586	0.380	0.010	1.708	1.936	0.600
Purpose: Holiday	64.303***	51.608***	25.833***	41.081***	5.281*	4.576	12.760***	4.064
Purpose: Business	0.183	0.454	0.784	0.193	3.881*	2.608	0.106	0.800
Male	0.147	0.122	1.358	0.115	4.850*	5.194*	0.625	2.139
Aged under 25	1.255	4.635*	8.764**	0.216	14.909***	1.573	1.619	0.342
Aged 25 to 65	7.592**	8.472**	15.103***	8.286**	6.488**	3.751	1.767	0.147
Air departure	2.761	2.369	3.143	3.502	0.321	3.337	6.724**	7.536**
Group size: 2	0.096	0.124	0.173	0.838	0.083	1.048	1.960	1.731
Group size: 3 or more	1.189	0.854	1.136	0.605	0.051	0.419	0.217	0.734
Require visa	0.597	0.002	1.792	1.050	18.880***	17.468***	3.737	10.249**
Influence: Friends	5.934*	8.331**	3.208	2.598	4.117*	0.709	0.771	0.109
Influence: Guidebook	11.774***	15.618***	12.864***	5.563*	0.956	2.305	1.144	3.220
Influence: Review sites	0.580	0.840	1.459	0.438	0.291	0.725	0.019	0.478
Influence: Tourist board	0.800	1.183	0.555	0.586	10.690**	4.762*	0.352	0.056
Influence: Media	0.222	0.366	1.176	1.103	0.006	3.874*	2.383	2.394
Influence: Social media	10.777**	7.609**	3.040	0.102	0.176	1.292	2.311	2.386
Total Expenditure:								
Length of stay	26.578***	7.370**	1.913	0.016	10.019***	19.386***	7.269**	4.165*
Attend live football	11.437***	17.851***	9.616**	9.699**	5.922*	4.760*	2.889	0.029
Male	0.184	0.121	1.354	0.076	4.315*	5.053*	0.530	2.045
Aged under 25	1.587	5.033*	9.540**	0.365	13.705***	1.522	1.726	0.428
Aged between 25 and 65	7.942**	8.845**	15.262***	8.275**	6.697**	3.764	1.531	0.091
Air departure	2.789	2.421	3.178	3.541	0.408	3.444	6.894**	7.312**
Purpose: Holiday	61.620***	53.218***	27.278***	42.742***	5.769*	4.648*	12.718***	3.902*
Purpose: Business	0.164	0.424	0.762	0.195	3.898*	2.742	0.155	0.879
Group Size: 2	0.051	0.061	0.279	0.943	0.037	1.262	2.120	1.743
Group Size: 3 or more	1.155	0.760	1.134	0.641	0.204	0.396	0.230	0.745
Require visa	0.682	0.013	1.595	0.957	14.056***	16.915***	3.564	10.308**
Influence: Friends	5.845*	7.975**	3.289	2.706	3.714	0.711	0.799	0.131
Influence: Guidebook	17.943***	17.904***	13.935***	6.305*	0.797	2.019	1.114	3.037
Influence: Review sites	0.477	0.689	1.343	0.410	0.151	0.659	0.011	0.540
Influence: Tourist board	0.884	0.616	0.373	0.588	8.944	4.676*	0.330	0.084
Influence: Media	0.127	0.394	0.976	0.921	0.138	4.389*	2.400	1.607
Influence: Social media	10.510**	6.797**	3.083	0.122	0.059	1.172	2.200	1.995

Table A3: Chi-squared tests of parameter equality

Notes: Coefficients tests are generated in STATA using seemingly unrelated regressions on the respective recentred influence functi
(1) of the main paper. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

C Daily Spending Results

In this appendix we utilise spending per day rather than the total spend to form the dependent variable. Few papers adopt this approach in the tourism expenditure literature, but it is nevertheless beneficial to confirm the robustness of the results from the main paper to the change to daily spending. As before the price of football tickets is deducted from the total expenditure reported to create the new adjusted expenditure and this is then subsequently divided by the length of stay. Tables A4 and A5 report the new estimates for the variables. For brevity only five τ levels are reported and the test of parameter equality provides the joint test for these five τ's.

From the two tables it is clear that there are many similarities with the results of the main paper, particularly in terms of the significance of the effect. However, there is also a notable change in the lower quantiles where the impact of football is much reduced. An immediate point is the similarity between the two sets of coefficients, something which was not seen in the total expenditure modelling of the main paper. Figure A1 illustrates the comparison more clearly using solid lines for UQR results and dot-dashed lines for OLS, and giving 95% confidence intervals as thinner lines surrounding the thick lines of the coefficients. In the left panels (a) and (c) we see that the coefficient tracks the OLS closely, with some small regions of significance in the UQR coefficients at the highest quantiles. In the right hand column, (b) and (d), there is no longer the big differential between high and low spenders within the quantile regression, although the higher τ's do yield significantly lower coefficients than the mid range. No significance is suggested by the UQR regression below $\tau = 0.25$ but the difference in confidence interval versus the OLS is minimal. The smoothing of coefficients after changing to a per day measure has interest, but the value of UQR remains strong as the parameter equality tests confirm.

Our results in this appendix should not be seen as a surprise, where individuals take in a football match their expenditure will be high. If their main trip purpose is to watch the match then they will often arrive close to match-day and subsequently leave the UK shortly after the game they will be left with a much higher spend per day than other visitors who stay longer but do not engage in such expensive activities. With most matches taking places at weekends the EPL suits such short trips well. Hence the key message to take from the daily spending estimates is that OLS is not representing the

Table A4: Unconditional Quantile Regression Estimates for Inbound Expenditure per day in the United Kingdom: Adjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Attend live soccer	0.168	0.097	0.218	0.247	0.191*	0.126	6.083
	(0.144)	(0.157)	(0.163)	(0.142)	(0.096)	(0.073)	
Air departure	0.521**	0.739	0.692**	0.607***	0.430***	0.262**	520.43***
	(0.210)	(0.409)	(0.245)	(0.139)	(0.129)	(0.109)	
Male	0.143***	0.121*	0.168***	0.138***	0.114***	0.115***	6.636
	(0.037)	(0.062)	(0.052)	(0.031)	(0.022)	(0.029)	
Aged under 25	0.004	0.103	0.069	-0.119**	-0.132**	-0.121***	8.086
	(0.072)	(0.108)	(0.076)	(0.042)	(0.042)	(0.024)	
Aged 25-64	0.381***	0.508***	0.464***	0.264***	0.225***	0.161***	24.729***
	(0.070)	(0.118)	(0.041)	(0.027)	(0.022)	(0.042)	
Purpose: Holiday	0.509***	0.796***	0.914***	0.544***	0.156**	0.038	100.66***
	(0.055)	(0.082)	(0.085)	(0.035)	(0.062)	(0.050)	
Purpose: Business	0.511***	0.086	0.431***	0.600***	0.696***	0.638***	89.87***
	(0.111)	(0.203)	(0.103)	(0.064)	(0.095)	(0.146)	
Require visa	0.204	0.155	0.166	0.207	0.240**	0.279*	0.684
	(0.170)	(0.282)	(0.231)	(0.119)	(0.097)	(0.147)	
Group size: 2	-0.210***	-0.110**	-0.190***	-0.204***	-0.262***	-0.285***	47.39***
	(0.022)	(0.048)	(0.030)	(0.012)	(0.034)	(0.048)	
Group size: 3 or more	-0.409***	-0.354***	-0.565***	-0.455***	-0.376***	-0.356***	119.21***
	(0.026)	(0.042)	(0.045)	(0.042)	(0.034)	(0.057)	
Influence: Friends	-0.315***	-0.239***	-0.458***	-0.394***	-0.262***	-0.211***	192.41***
	(0.040)	(0.057)	(0.048)	(0.037)	(0.030)	(0.041)	
Influence: Guidebook	0.046	0.163***	0.173**	0.006	-0.023	-0.049	30.13***
	(0.035)	(0.047)	(0.059)	(0.037)	(0.028)	(0.035)	
Influence: Review sites	0.089***	0.186***	0.136***	0.091**	0.037**	0.022	58.72***
	(0.021)	(0.028)	(0.035)	(0.035)	(0.015)	(0.020)	
Influence: Tourist board	0.074	0.071	0.047	0.040	0.050	0.030	0.435
	(0.044)	(0.051)	(0.048)	(0.041)	(0.046)	(0.107)	
Influence: Media	0.002	-0.037	0.021	0.037	0.100	-0.005	28.98***
	(0.069)	(0.113)	(0.076)	(0.052)	(0.058)	(0.070)	
Influence: Social Media	0.125***	0.159***	0.157***	0.163***	0.048*	0.091*	29.02***
	(0.024)	(0.046)	(0.029)	(0.037)	(0.026)	(0.042)	
Constant	3.432***	1.478***	2.479***	3.627***	4.576***	5.376***	
	(0.212)	(0.376)	(0.240)	(0.144)	(0.120)	(0.110)	
Observations	39,525	39,525	39,525	39,525	39,525	39,525	
R-squared	0.141	0.042	0.104	0.147	0.136	0.070	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

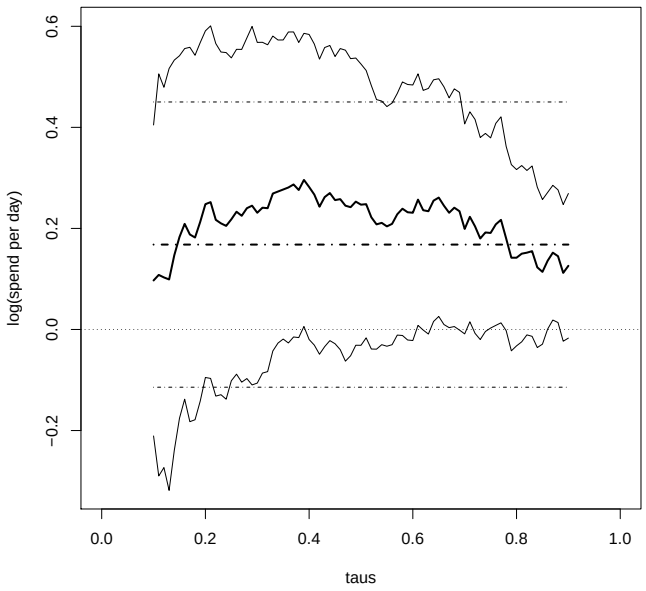
Table A5: Unconditional Quantile Regression Estimates for Inbound Expenditure per day in the United Kingdom: Unadjusted Expenditure

Variable	Unadjusted expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Attend live soccer	0.329*	0.327**	0.400*	0.411**	0.351**	0.194*	14.49**
	(0.157)	(0.136)	(0.187)	(0.172)	(0.142)	(0.091)	
Air passenger	0.520**	0.753*	0.697**	0.588***	0.431***	0.260**	622.88***
	(0.210)	(0.412)	(0.246)	(0.141)	(0.129)	(0.108)	
Male	0.143***	0.115	0.169***	0.140***	0.115***	0.117***	7.059
	(0.037)	(0.064)	(0.052)	(0.031)	(0.021)	(0.030)	
Aged under 25	0.005	0.107	0.070	-0.120**	-0.131**	-0.122***	8.535***
	(0.072)	(0.109)	(0.075)	(0.042)	(0.041)	(0.024)	
Aged 25 to 64	0.382***	0.500***	0.465***	0.257***	0.225***	0.160***	26.95***
	(0.069)	(0.120)	(0.040)	(0.030)	(0.022)	(0.041)	
Purpose: Holiday	0.506***	0.795***	0.917***	0.543***	0.153**	0.034	103.45***
	(0.055)	(0.085)	(0.086)	(0.036)	(0.061)	(0.051)	
Purpose: Business	0.510***	0.092	0.434***	0.606***	0.691***	0.628***	98.94***
	(0.111)	(0.204)	(0.103)	(0.063)	(0.095)	(0.143)	
Require visa	0.203	0.164	0.169	0.204	0.238**	0.277*	0.767
	(0.170)	(0.273)	(0.235)	(0.122)	(0.097)	(0.146)	
Group size: 2	-0.208***	-0.106*	-0.189***	-0.213***	-0.261***	-0.286***	35.32***
	(0.022)	(0.049)	(0.029)	(0.011)	(0.033)	(0.047)	
Group size: 3 or more	-0.406***	-0.357***	-0.559***	-0.458***	-0.373***	-0.356***	164.95***
	(0.025)	(0.035)	(0.043)	(0.045)	(0.034)	(0.057)	
Influence: Friends	-0.316***	-0.239***	-0.460***	-0.400***	-0.264***	-0.214***	195.41***
	(0.040)	(0.057)	(0.047)	(0.038)	(0.030)	(0.040)	
Influence: Guidebook	0.045	0.166***	0.175**	-0.004	-0.018	-0.052	38.05***
	(0.035)	(0.049)	(0.057)	(0.037)	(0.027)	(0.034)	
Influence: Review sites	0.088***	0.178***	0.134***	0.092**	0.039**	0.027	80.12***
	(0.021)	(0.025)	(0.036)	(0.036)	(0.014)	(0.020)	
Influence: Tourist board	0.073	0.091	0.049	0.047	0.044	0.029	0.542
	(0.044)	(0.053)	(0.047)	(0.040)	(0.046)	(0.106)	
Influence: Media	-0.001	-0.032	0.024	0.049	0.092	-0.006	17.94**
	(0.069)	(0.109)	(0.081)	(0.051)	(0.056)	(0.069)	
Influence: Social Media	0.124***	0.163***	0.163***	0.147***	0.046	0.090*	21.50***
	(0.024)	(0.045)	(0.032)	(0.038)	(0.027)	(0.043)	
Constant	3.433***	1.473***	2.470***	3.645***	4.576***	5.384***	
	(0.213)	(0.377)	(0.242)	(0.146)	(0.120)	(0.110)	
Observations	39,525	39,525	39,525	39,525	39,525	39,525	
R-squared	0.142	0.043	0.105	0.148	0.137	0.070	

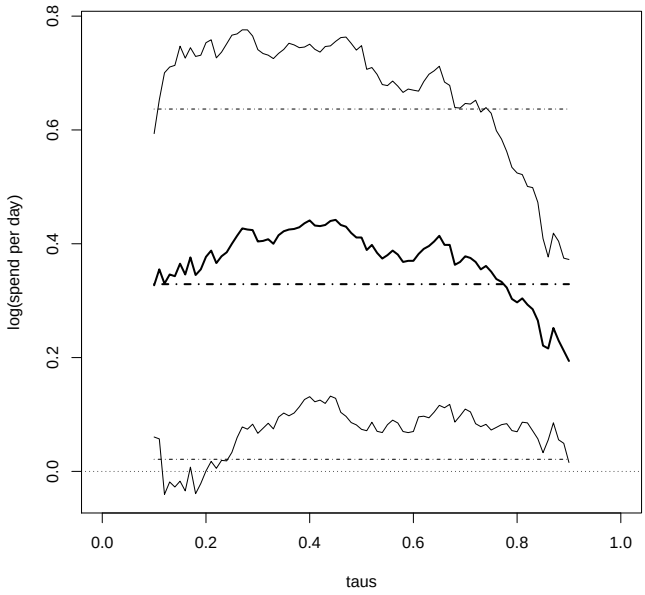
Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Figure A1: Impact of Live Football Attendance on Inbound Visitor Expenditure in the United Kingdom

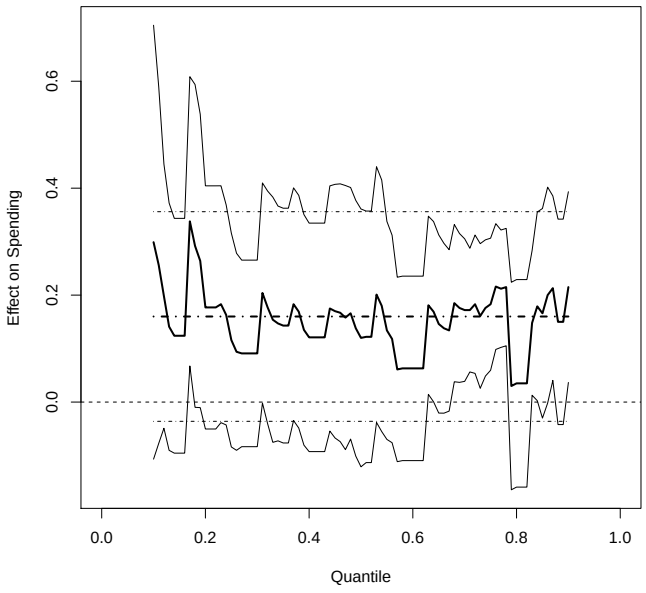
(a) Adjusted Expenditure (Daily)



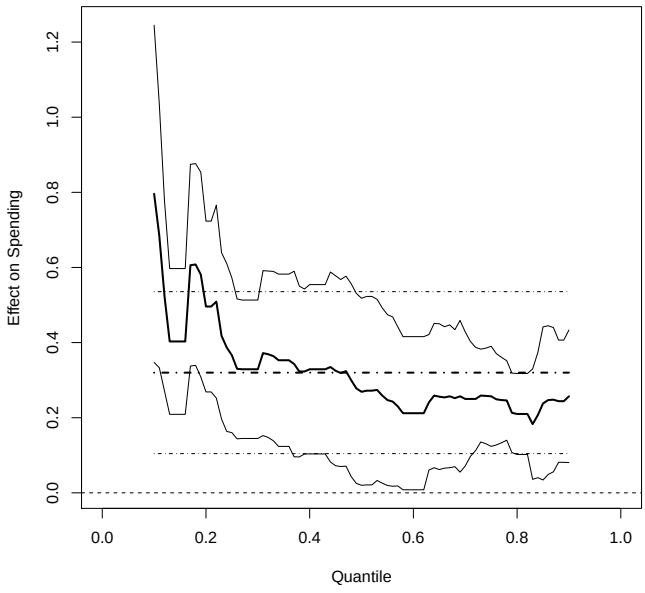
(b) Unadjusted Expenditure (Daily)



(c) Adjusted Expenditure (Total)



(d) Unadjusted Expenditure (Total)



Notes: Left panel displays ticket price adjusted expenditure. Right panel shows the unadjusted expenditure recorded for each visitor. Top Row is the per day expenditure of this appendix. Bottom row is unadjusted expenditure from the main paper. 95% confidence intervals are plotted as dotted lines for the UQR. OLS coefficients are plotted using a dot-dash line, with corresponding 95% confidence intervals drawn as dotted lines

effect of football attendance on total expenditure as well as policy-makers should demand.

D Regional Models

In this appendix we consider the three largest nations in terms of tourist numbers heading to the United Kingdom to watch football as outlined in Table 3 in the main paper. Because of UK visa rules there are no countries in the EU group which require visas and all countries in the North America group do. Consequently the visa dummy is only reported for those coming from European nations that are not members of the European Union. We provide six tables covering both adjusted and unadjusted expenditures detailing coefficients from the fixed effects OLS regression and at $\tau = 0.1, 0.25, 0.5, 0.75$ and $\tau = 0.9$.

Results on the effect of attendance at live football are presented within the main paper and show that European visitors (EU or Non-EU) are the highest spenders. Under the unadjusted measure we see a smaller differential between the three regions, implying that North Americans are spending more of their money on tickets relative to the others. Our other control variables have broadly similar effects on the adjusted and unadjusted expenditure variables. However there are notable differences between regions, indicating further interesting directions for research on nationality effects beyond the scope of this paper or its dataset. Length of stay is a clear example, being much larger for North American visitors than for those travelling from the much closer EU. As distance from the UK increases so too does the role of air travel, those coming from both North America and non-EU countries have much stronger effects at $\tau = 0.1$ than the Europeans. It should be noted here that not all departures of North American nationals are by air, many use the ferry to go to Europe as part of a wider holiday and actually only spend a short time in the UK. Hence this result on flying is not directly attributable to the relative positions of the countries. Being from the younger age group shows negative significant relationships with expenditure in the main paper, and that result persists for both the EU and North America, but the coefficients at the extremes of the distribution for non-EU Europeans are positive; more investigation may be beneficial here too.

In the purpose of travel comparison, holiday-makers from the EU and North America have a broadly similar premium over those visiting friends and relatives, approximately 0.45 in the fixed

Table A6: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: European Union Adjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.509***	0.405***	0.389***	0.383***	0.431***	0.685***	262.5***
	(0.011)	(0.022)	(0.011)	(0.008)	(0.008)	(0.019)	
Attend live football	0.181***	0.238**	0.178***	0.115***	0.151***	0.358***	12.52*
	(0.049)	(0.104)	(0.060)	(0.043)	(0.042)	(0.082)	
Air departure	0.396***	0.638***	0.433***	0.361***	0.180***	0.137***	182.8***
	(0.018)	(0.044)	(0.023)	(0.016)	(0.015)	(0.025)	
Male	0.076***	0.056*	0.059***	0.056***	0.066***	0.116***	6.341
	(0.014)	(0.034)	(0.019)	(0.014)	(0.014)	(0.024)	
Aged under 25	-0.105***	-0.087	-0.137***	-0.152***	-0.178***	-0.184***	1.396
	(0.034)	(0.082)	(0.045)	(0.032)	(0.032)	(0.057)	
Aged 25 to 64	0.123***	0.168**	0.089**	0.059**	0.030	0.085	4.920
	(0.032)	(0.074)	(0.040)	(0.029)	(0.030)	(0.054)	
Purpose: Holiday	0.437***	0.954***	0.670***	0.432***	0.200***	-0.041	516.6***
	(0.017)	(0.043)	(0.024)	(0.017)	(0.016)	(0.028)	
Purpose: Business	0.253***	0.267***	0.290***	0.281***	0.251***	0.323***	6.905
	(0.026)	(0.059)	(0.032)	(0.022)	(0.022)	(0.042)	
Group size: 2	-0.203***	-0.181***	-0.222***	-0.217***	-0.160***	-0.231***	19.10***
	(0.017)	(0.042)	(0.024)	(0.017)	(0.017)	(0.029)	
Group size: 3 or more	-0.418***	-0.444***	-0.469***	-0.383***	-0.319***	-0.505***	72.17***
	(0.019)	(0.051)	(0.028)	(0.020)	(0.018)	(0.029)	
Influence: Friends	-0.238***	-0.177***	-0.277***	-0.219***	-0.207***	-0.236***	21.68***
	(0.016)	(0.038)	(0.022)	(0.015)	(0.015)	(0.027)	
Influence: Guidebook	0.096***	0.167***	0.144***	0.071***	0.065**	0.045	8.946
	(0.021)	(0.039)	(0.029)	(0.025)	(0.028)	(0.047)	
Influence: Review sites	0.122***	0.093**	0.174***	0.099***	0.098***	0.172***	11.59*
	(0.022)	(0.046)	(0.031)	(0.027)	(0.029)	(0.052)	
Influence: Tourist board	0.189***	0.195***	0.144***	0.194***	0.287***	0.204**	7.945
	(0.031)	(0.050)	(0.041)	(0.037)	(0.045)	(0.087)	
Influence: Media	0.137***	0.170**	0.073	0.122**	0.129**	0.292***	5.001
	(0.044)	(0.078)	(0.062)	(0.050)	(0.054)	(0.106)	
Influence: Social media	0.170***	0.328***	0.104**	0.058	0.076*	0.229***	26.55***
	(0.033)	(0.054)	(0.048)	(0.039)	(0.041)	(0.077)	
Constant	4.579***	3.093***	4.185***	4.945***	5.559***	5.902***	
	(0.042)	(0.101)	(0.052)	(0.036)	(0.036)	(0.064)	
Observations	16,533	16,533	16,533	16,533	16,533	16,533	
R-squared	0.247	0.077	0.149	0.190	0.177	0.140	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table A7: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: European Union Unadjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.505***	0.373***	0.379***	0.395***	0.431***	0.689***	260.2***
	(0.011)	(0.020)	(0.011)	(0.008)	(0.008)	(0.019)	
Attend live football	0.394***	0.642***	0.385***	0.366***	0.227***	0.383***	36.80***
	(0.039)	(0.070)	(0.054)	(0.042)	(0.044)	(0.083)	
Air departure	0.394***	0.590***	0.428***	0.274***	0.179***	0.137***	132.4***
	(0.017)	(0.041)	(0.023)	(0.016)	(0.015)	(0.026)	
Male	0.074***	0.046	0.059***	0.056***	0.066***	0.118***	6.996
	(0.014)	(0.032)	(0.019)	(0.014)	(0.014)	(0.024)	
Aged under 25	-0.104***	-0.061	-0.123***	-0.124***	-0.175***	-0.185***	3.860
	(0.034)	(0.076)	(0.044)	(0.032)	(0.033)	(0.057)	
Aged 25 to 64	0.123***	0.163**	0.093**	0.063**	0.031	0.086	5.272
	(0.032)	(0.069)	(0.040)	(0.029)	(0.030)	(0.054)	
Purpose: Holiday	0.432***	0.875***	0.649***	0.421***	0.197***	-0.040	493.8***
	(0.017)	(0.040)	(0.023)	(0.017)	(0.016)	(0.028)	
Purpose: Business	0.249***	0.252***	0.281***	0.284***	0.251***	0.319***	6.839
	(0.026)	(0.055)	(0.031)	(0.022)	(0.022)	(0.043)	
Group size: 2	-0.201***	-0.167***	-0.212***	-0.180***	-0.159***	-0.233***	14.18**
	(0.017)	(0.039)	(0.024)	(0.017)	(0.017)	(0.030)	
Group size: 3 or more	-0.411***	-0.407***	-0.462***	-0.327***	-0.320***	-0.509***	82.65***
	(0.018)	(0.047)	(0.027)	(0.020)	(0.018)	(0.030)	
Influence: Friends	-0.240***	-0.165***	-0.275***	-0.258***	-0.205***	-0.239***	28.34***
	(0.016)	(0.036)	(0.021)	(0.015)	(0.015)	(0.027)	
Influence: Guidebook	0.096***	0.157***	0.138***	0.061**	0.068**	0.046	9.076
	(0.020)	(0.037)	(0.028)	(0.026)	(0.028)	(0.047)	
Influence: Review sites	0.120***	0.088**	0.178***	0.092***	0.097***	0.168***	13.68**
	(0.022)	(0.042)	(0.031)	(0.028)	(0.029)	(0.052)	
Influence: Tourist board	0.190***	0.201***	0.138***	0.204***	0.290***	0.194**	9.338
	(0.030)	(0.045)	(0.041)	(0.038)	(0.045)	(0.087)	
Influence: Media	0.134***	0.151**	0.047	0.141***	0.121**	0.295***	7.549
	(0.044)	(0.074)	(0.061)	(0.050)	(0.055)	(0.106)	
Influence: Social Media	0.171***	0.304***	0.109**	0.085**	0.083**	0.231***	21.61***
	(0.032)	(0.050)	(0.047)	(0.040)	(0.041)	(0.077)	
Constant	4.587***	3.211***	4.210***	4.916***	5.561***	5.901***	
	(0.041)	(0.094)	(0.051)	(0.035)	(0.036)	(0.064)	
Observations	16,533	16,533	16,533	16,533	16,533	16,533	
R-squared	0.248	0.077	0.150	0.185	0.177	0.140	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table A8: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: Non-EU Adjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.444***	0.519***	0.461***	0.368***	0.401***	0.520***	39.08***
	(0.021)	(0.076)	(0.032)	(0.019)	(0.020)	(0.031)	
Attend live football	0.459***	0.317*	0.609***	0.590***	0.360***	0.405***	7.542
	(0.069)	(0.185)	(0.122)	(0.092)	(0.100)	(0.125)	
Air departure	1.536***	5.384***	2.166***	1.055***	0.612***	0.296***	552.0***
	(0.050)	(0.245)	(0.082)	(0.046)	(0.042)	(0.050)	
Male	0.009	-0.157	-0.042	0.043	0.011	0.057	6.476
	(0.029)	(0.099)	(0.056)	(0.037)	(0.037)	(0.044)	
Aged under 25	0.078	0.576*	-0.090	-0.174*	0.062	0.237**	15.94**
	(0.087)	(0.329)	(0.157)	(0.098)	(0.092)	(0.108)	
Aged 25 to 64	0.205**	0.504	0.164	0.021	0.219**	0.244**	7.193
	(0.082)	(0.311)	(0.145)	(0.092)	(0.086)	(0.099)	
Purpose: Holiday	0.652***	1.269***	1.214***	0.737***	0.360***	0.121**	211.7***
	(0.033)	(0.109)	(0.063)	(0.044)	(0.045)	(0.052)	
Purpose: Business	-0.021	-1.708***	-0.047	0.282***	0.291***	0.187***	126.6***
	(0.047)	(0.183)	(0.082)	(0.053)	(0.056)	(0.069)	
Require visa	0.490***	0.294**	0.396***	0.493***	0.634***	0.799***	18.94***
	(0.041)	(0.121)	(0.061)	(0.047)	(0.057)	(0.082)	
Group size: 2	-0.329***	-0.470***	-0.440***	-0.290***	-0.245***	-0.195***	10.17*
	(0.035)	(0.130)	(0.065)	(0.043)	(0.042)	(0.049)	
Group size: 3 or more	-0.412***	-0.374**	-0.655***	-0.331***	-0.374***	-0.402***	20.50***
	(0.039)	(0.146)	(0.084)	(0.053)	(0.049)	(0.051)	
Influence: Friends	-0.273***	-0.092	-0.299***	-0.349***	-0.300***	-0.323***	7.076
	(0.032)	(0.107)	(0.060)	(0.041)	(0.041)	(0.049)	
Influence: Guidebook	0.070	-0.040	0.003	0.005	0.162*	0.113	4.148
	(0.056)	(0.152)	(0.094)	(0.078)	(0.085)	(0.102)	
Influence: Review sites	0.085	0.013	0.107	0.226***	0.018	0.180*	8.764
	(0.055)	(0.124)	(0.100)	(0.083)	(0.087)	(0.109)	
Influence: Tourist board	0.171*	-0.132	0.215	0.287**	0.213	0.127	2.458
	(0.088)	(0.321)	(0.147)	(0.116)	(0.140)	(0.178)	
Influence: Media	0.263**	0.309	0.351**	0.115	0.387**	0.261	4.364
	(0.126)	(0.288)	(0.164)	(0.166)	(0.180)	(0.243)	
Influence: Social media	0.153**	0.056	0.130	0.098	0.258**	0.047	4.248
	(0.075)	(0.233)	(0.146)	(0.102)	(0.108)	(0.125)	
Constant	3.458***	-1.695***	2.308***	4.206***	5.109***	5.747***	
	(0.104)	(0.428)	(0.182)	(0.110)	(0.104)	(0.125)	
Observations	5,202	5,202	5,202	5,202	5,202	5,202	
R-squared	0.406	0.306	0.278	0.231	0.173	0.154	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table A9: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: Non-EU Unadjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.442***	0.516***	0.454***	0.364***	0.400***	0.518***	39.20***
	(0.021)	(0.076)	(0.032)	(0.019)	(0.021)	(0.031)	
Attend live football	0.607***	0.561***	0.837***	0.678***	0.570***	0.404***	9.661*
	(0.061)	(0.124)	(0.102)	(0.091)	(0.104)	(0.125)	
Air departure	1.536***	5.424***	2.235***	1.053***	0.613***	0.296***	589.0***
	(0.050)	(0.246)	(0.081)	(0.045)	(0.042)	(0.050)	
Male	0.008	-0.163*	-0.028	0.043	0.017	0.057	5.918
	(0.029)	(0.099)	(0.055)	(0.037)	(0.038)	(0.044)	
Aged under 25	0.081	0.580*	-0.097	-0.150	0.049	0.237**	14.75**
	(0.087)	(0.331)	(0.155)	(0.096)	(0.093)	(0.107)	
Aged 25 to 64	0.205**	0.506	0.147	0.046	0.198**	0.244**	5.321
	(0.082)	(0.314)	(0.143)	(0.090)	(0.087)	(0.099)	
Purpose: Holiday	0.652***	1.290***	1.171***	0.721***	0.353***	0.121**	203.9***
	(0.033)	(0.108)	(0.062)	(0.044)	(0.045)	(0.052)	
Puropose: Business	-0.021	-1.717***	-0.034	0.273***	0.279***	0.186***	125.3***
	(0.047)	(0.183)	(0.080)	(0.053)	(0.056)	(0.069)	
Require visa	0.491***	0.292**	0.403***	0.487***	0.642***	0.797***	19.31***
	(0.040)	(0.122)	(0.059)	(0.047)	(0.057)	(0.082)	
Group size: 2	-0.328***	-0.492***	-0.428***	-0.286***	-0.249***	-0.195***	9.904*
	(0.035)	(0.130)	(0.064)	(0.043)	(0.042)	(0.049)	
Group size: 3 or more	-0.411***	-0.378***	-0.636***	-0.324***	-0.382***	-0.401***	19.62***
	(0.039)	(0.146)	(0.082)	(0.053)	(0.049)	(0.051)	
Influence: Friends	-0.272***	-0.070	-0.293***	-0.352***	-0.295***	-0.322***	8.738
	(0.032)	(0.106)	(0.059)	(0.041)	(0.041)	(0.049)	
Influence: Guidebook	0.070	-0.049	0.004	0.000	0.184**	0.113	5.808
	(0.056)	(0.153)	(0.093)	(0.078)	(0.086)	(0.102)	
Influence: Review sites	0.085	0.001	0.114	0.229***	0.024	0.180*	8.668
	(0.054)	(0.125)	(0.098)	(0.083)	(0.088)	(0.108)	
Influence: Tourist board	0.171*	-0.123	0.182	0.261**	0.215	0.126	1.853
	(0.088)	(0.324)	(0.141)	(0.117)	(0.141)	(0.178)	
Influence: Media	0.261**	0.306	0.356**	0.116	0.386**	0.260	4.373
	(0.126)	(0.290)	(0.164)	(0.166)	(0.181)	(0.242)	
Influence: Social media	0.149**	0.046	0.136	0.119	0.251**	0.047	3.461
	(0.075)	(0.234)	(0.145)	(0.101)	(0.109)	(0.125)	
Constant	3.459***	-1.727***	2.278***	4.199***	5.138***	5.752***	
	(0.104)	(0.430)	(0.179)	(0.108)	(0.105)	(0.125)	
Observations	5,202	5,202	5,202	5,202	5,202	5,202	
R-squared	0.410	0.309	0.291	0.231	0.175	0.154	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table A10: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: North America Adjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.618***	0.718***	0.729***	0.548***	0.466***	0.493***	102.4***
	(0.018)	(0.043)	(0.025)	(0.016)	(0.016)	(0.025)	
Attend live football	0.181	0.326*	0.170	0.081	0.157	0.113	1.818
	(0.111)	(0.191)	(0.164)	(0.126)	(0.114)	(0.161)	
Air departure	0.364***	0.787***	0.495***	0.530***	0.225***	0.077	45.23***
	(0.057)	(0.171)	(0.105)	(0.063)	(0.049)	(0.060)	
Male	0.148***	0.194***	0.180***	0.165***	0.099***	0.070*	5.611
	(0.029)	(0.068)	(0.046)	(0.034)	(0.032)	(0.041)	
Aged under 25	-0.229***	-0.364**	-0.356***	-0.409***	-0.155***	0.003	23.32***
	(0.062)	(0.155)	(0.099)	(0.067)	(0.060)	(0.075)	
Aged 25 to 64	0.195***	0.340***	0.329***	0.037	0.065	0.141**	21.60***
	(0.046)	(0.111)	(0.073)	(0.053)	(0.050)	(0.061)	
Purpose: Holiday	0.468***	0.883***	0.730***	0.515***	0.195***	-0.007	147.3***
	(0.034)	(0.082)	(0.056)	(0.040)	(0.036)	(0.046)	
Purpose: Business	0.834***	1.055***	1.123***	0.926***	0.605***	0.318***	90.93***
	(0.043)	(0.091)	(0.063)	(0.049)	(0.051)	(0.068)	
Group size: 2	-0.229***	-0.123	-0.133**	-0.247***	-0.286***	-0.355***	10.19*
	(0.034)	(0.085)	(0.057)	(0.041)	(0.037)	(0.047)	
Group size: 3 or more	-0.500***	-0.568***	-0.387***	-0.422***	-0.524***	-0.611***	11.58*
	(0.044)	(0.126)	(0.079)	(0.055)	(0.044)	(0.049)	
Influence: Friends	-0.200***	0.043	-0.101**	-0.279***	-0.276***	-0.270***	23.60***
	(0.031)	(0.071)	(0.050)	(0.036)	(0.034)	(0.044)	
Influence: Guidebook	0.228***	0.182**	0.303***	0.227***	0.191***	0.284***	5.385
	(0.043)	(0.083)	(0.068)	(0.060)	(0.061)	(0.082)	
Influence: Review sites	0.192***	0.227**	0.167**	0.218***	0.219***	0.122	2.605
	(0.049)	(0.097)	(0.075)	(0.063)	(0.063)	(0.084)	
Influence: Tourist board	0.069	-0.065	0.037	0.092	0.206**	-0.040	5.984
	(0.067)	(0.136)	(0.106)	(0.094)	(0.103)	(0.133)	
Influence: Media	0.017	0.084	-0.037	-0.062	0.080	0.245	3.776
	(0.096)	(0.168)	(0.151)	(0.120)	(0.122)	(0.178)	
Influence: Social media	0.088	-0.132	-0.028	0.073	0.067	0.416***	11.86*
	(0.087)	(0.168)	(0.127)	(0.102)	(0.097)	(0.143)	
Constant	4.477***	1.904***	3.090***	4.692***	6.009***	6.818***	
	(0.079)	(0.230)	(0.136)	(0.085)	(0.072)	(0.086)	
Observations	5,549	5,549	5,549	5,549	5,549	5,549	
R-squared	0.335	0.126	0.225	0.251	0.193	0.125	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Table A11: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: North America Unadjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.617***	0.727***	0.727***	0.547***	0.465***	0.498***	130.1***
	(0.017)	(0.043)	(0.025)	(0.016)	(0.016)	(0.025)	
Attend live football	0.305***	0.480***	0.364**	0.185	0.184	0.378**	5.411
	(0.099)	(0.161)	(0.151)	(0.123)	(0.113)	(0.175)	
Air departure	0.365***	0.795***	0.483***	0.530***	0.224***	0.079	45.52***
	(0.057)	(0.172)	(0.104)	(0.063)	(0.049)	(0.060)	
Male	0.149***	0.192***	0.179***	0.165***	0.098***	0.068*	5.639
	(0.029)	(0.068)	(0.046)	(0.034)	(0.032)	(0.041)	
Aged under 25	-0.225***	-0.359**	-0.359***	-0.405***	-0.155***	-0.027	20.29***
	(0.061)	(0.156)	(0.099)	(0.067)	(0.060)	(0.076)	
Aged 25 to 64	0.195***	0.345***	0.333***	0.037	0.065	0.122**	21.51***
	(0.046)	(0.112)	(0.073)	(0.053)	(0.050)	(0.062)	
Purpose: Holiday	0.470***	0.889***	0.724***	0.519***	0.195***	-0.019	151.7***
	(0.034)	(0.082)	(0.056)	(0.040)	(0.036)	(0.046)	
Purpose: Business	0.834***	1.064***	1.122***	0.923***	0.607***	0.314***	91.29***
	(0.043)	(0.092)	(0.063)	(0.049)	(0.051)	(0.068)	
Group size: 2	-0.229***	-0.117	-0.124**	-0.247***	-0.286***	-0.351***	10.50*
	(0.034)	(0.086)	(0.057)	(0.041)	(0.037)	(0.047)	
Group size: 3 or more	-0.501***	-0.561***	-0.381***	-0.431***	-0.523***	-0.619***	11.98*
	(0.044)	(0.126)	(0.079)	(0.055)	(0.044)	(0.049)	
Influence: Friends	-0.199***	0.035	-0.104**	-0.284***	-0.277***	-0.273***	23.20***
	(0.031)	(0.071)	(0.050)	(0.036)	(0.034)	(0.044)	
Influence: Guidebook	0.226***	0.179**	0.300***	0.233***	0.191***	0.280***	5.148
	(0.043)	(0.084)	(0.068)	(0.060)	(0.060)	(0.082)	
Influence: Review sites	0.192***	0.226**	0.164**	0.218***	0.219***	0.148*	1.832
	(0.048)	(0.097)	(0.075)	(0.063)	(0.063)	(0.084)	
Influence: Tourist board	0.068	-0.068	0.036	0.092	0.206**	0.006	4.923
	(0.067)	(0.137)	(0.106)	(0.094)	(0.103)	(0.134)	
Influence: Media	0.013	0.078	-0.044	-0.064	0.078	0.217	2.851
	(0.095)	(0.169)	(0.151)	(0.119)	(0.122)	(0.178)	
Influence: Social media	0.085	-0.139	-0.034	0.051	0.066	0.394***	10.44*
	(0.087)	(0.170)	(0.127)	(0.102)	(0.097)	(0.144)	
Constant	4.477***	1.877***	3.104***	4.696***	6.010***	6.830***	
	(0.079)	(0.231)	(0.136)	(0.085)	(0.072)	(0.087)	
Observations	5,549	5,549	5,549	5,549	5,549	5,549	
R-squared	0.336	0.127	0.225	0.252	0.194	0.128	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

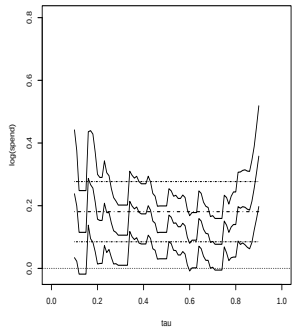
effects OLS. However, those coming from the non-EU nations see a differential closer to 0.65, with a coefficient of 1.2 at $\tau = 0.1$. This links to the influence of friends, relatives and colleagues in which non-EU travellers are able to get a bigger benefit from recommendations spending less than the other two regions. Unsurprisingly guidebooks are of bigger influence to North Americans, with many of the coefficients for more proximate travellers not significant. The tourist board actually achieves its most significant impacts with EU visitors, highlighting room for improvement there. Traditional media, newspapers, magazines and television, increase expenditure significantly for European visitors, particularly those from the EU, but do not impact on what North Americans are spending. Social media likewise is most effective in promoting spending for EU visitors, the only significance for North American visitors is at $\tau = 0.9$. This was a 2014 survey and the numbers reporting such influence were low, understanding more about the distributional impacts of social media with a more contemporary dataset would be an interesting line for further work.

Much of what is discussed in this dissection of the regional work highlights more questions than it answers, and the purpose of doing is more to once again underline the value of distributional regression techniques like UQR. Our focus is on live football and therefore we have necessarily kept the number of categories in other areas small; alternatively focused works may thus benefit from a different primary objective.

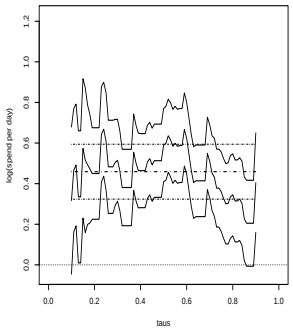
Figure A2 provides plots of the UQR and OLS coefficients on attendance at live football for each of the three regions discussed. As in the main paper we plot coefficients as thick lines and their 95% confidence intervals as thinner lines, using solid lines for UQR and dot-dashed lines for OLS. In common with the main paper there is a similar impact on football ticket price adjusted expenditure in the three regions although we do see more variability in the non-EU and North American plots around the median. The former is significantly higher than the OLS in this median range, while the latter drops significantly below. Our unadjusted plots show the downward sloping behaviour between $\tau = 0.1$ and $\tau = 0.5$ that we saw in the main paper, this giving the higher impact on the lowest spenders result. However, where the EU coefficients continue to fall, the North American values rise; only at the very extreme end of the considered range do EU effects increase and this may be attributable to tail effects. An interesting comparison comes between the non-EU set and the North American set above $\tau = 0.7$. Here panel (f) shows North American values rising to become significantly positive

Figure A2: Coefficient comparisons by region

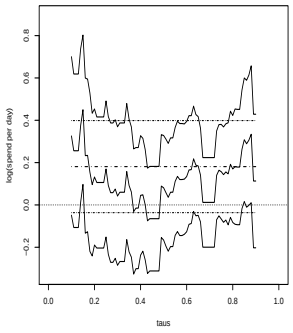
(a) Adjusted expenditure: EU



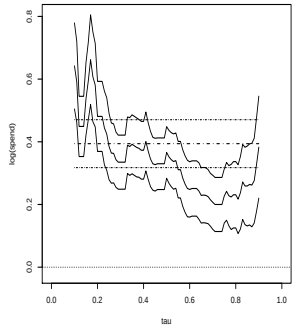
(b) Adjusted expenditure: Non-EU



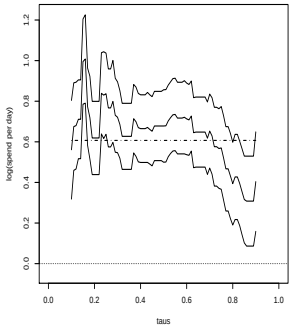
(c) Adjusted expenditure: North America



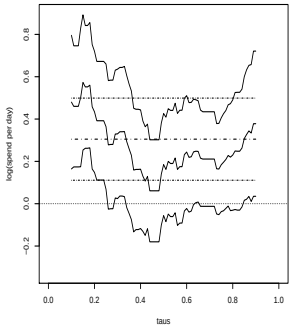
(d) Unadjusted expenditure: EU



(e) Unadjusted expenditure: Non-EU



(f) Unadjusted expenditure: North America



Notes: Graphs are plotted using the outcomes of the UQR for τ between 0.1 and 0.9 at intervals of 0.01. Solid lines indicate UQR results and horizontal dot-dash lines denote OLS regressions. Coefficients are plotted as thick lines. Confidence intervals are plotted with thinner lines and are constructed at the 95% level to show significance of estimates. Both Adjsuted and unadjusted expenditures are plotted on the same vertical scale for each region to ease comparison.

once more, whilst (e) shows the non-EU values going in the opposite direction to being significantly negative. Recalling that the main paper reports significant positive effects at all quantiles, as the EU displays in panel (d), these differences in the other regions are noteworthy.

This appendix has presented a more detailed discussion of the regional differences in football expenditure coefficients and extended this into a review of all of our other covariates. Many of the conclusions warrant further data for their more thorough investigation. We must consider distributional effects carefully and recognise other key differentials.

E Total Day Out

In order to understand the robustness of our conclusions we return to the BBC cost of football survey (BBC, 2014) to consider the total day out costs based upon the match ticket, matchday programme, pie and cup of tea prices. This is a measure used within the BBC when reporting on the effect of price changes on supporters. Whilst it is harder to know whether attendees purchase these items as well as the ticket it still offers an alternative perspective on the amounts of money being spent within the football club and hence, through the adjustment we can then understand more of the effect within the local economy.

From the survey we find the following data for costs of the day out package. The variation in total prices of pies, programmes and cups of tea is quite pronounced and does not always follow either geographic or divisional divides. Unsurprisingly the prices in London clubs that are successful are high, but at Old Trafford and the Etihad Stadium despite the success enjoyed by the two Manchester teams prices are notably lower. High prices at Selhurst Park are consistent with the London effect, but Stamford Bridge shows more reasonable numbers despite Chelsea's success.

We use these total day out figures to construct a new football adjusted measure of expenditure. Deductions are understandably larger than those for the adjusted measure in the main paper. Average expenditure after removal of football related day out costs falls from £948.50 to £889.90, a drop of almost £60. To see the impact on the summary statistics Table A13 has values for the new adjusted measures as well as the original two measures from the main paper. We report both the football attending subsample and the full sample used in the regressions.

Table A12: All expenditure items in BBC Cost of Football Survey

Stadium	Team	Additional Items				Ticket Prices			Day Out
		Programme	Pie	Tea	Total	Min	Max	Average	
		(£)	(£)	(£)	(£)	(£)	(£)	(£)	(£)
Wembley	National	5	4	3	12	50	50	50	62
Hampden Park	National	4	3	2.5	9.5	40	40	40	49.5
Millenium Stadium	National	4	3	2.5	9.5	40	40	40	49.5
Windsor Park	National	4	3	2.5	9.5	40	40	40	49.5
Emirates Stadium	Arsenal	3.5	3.6	2.2	9.3	27	97	62	71.3
Villa Park	Aston Villa	3	3.3	2.1	8.4	22	45	33.5	41.9
Cardiff City Stadium	Cardiff City	3	3.4	1.8	8.2	18	40	29	37.2
Stamford Bridge	Chelsea	3	2.5	2	7.5	50	87	68.5	76
Selhurst Park	Crystal Palace	3.5	4	2.2	9.7	30	40	35	44.7
Goodison Park	Everton	3	3.2	2.3	8.5	33	47	40	48.5
Craven Cottage	Fulham	3.5	3.5	1.9	8.9	25	45	35	43.9
KC Stadium	Hull City	3	3	2	8	16	50	33	41
Anfield	Liverpool	3	3.3	2.5	8.8	37	59	48	56.8
Etihad Stadium	Manchester City	3	5	1.8	9.8	37	58	47.5	57.3
Old Trafford	Manchester United	3.5	3.5	2.5	9.5	36	58	47	56.5
St James Park	Newcastle United	3	3	2.3	8.3	15	52	33.5	41.8
Carrow Road	Norwich City	3	3	2.1	8.1	25	40	32.5	40.6
St Mary's Stadium	Southampton	4	4	2.5	10.5	32	52	42	52.5
Britannia Stadium	Stoke City	3.5	2.9	2.2	8.6	25	50	37.5	46.1
Stadium of Light	Sunderland	3	3	2.2	8.2	25	40	32.5	40.7
Liberty Stadium	Swansea City	3	3.5	2	8.5	35	45	40	48.5
White Hart Lane	Tottenham Hotspurs	3.5	3.5	2	9	32	81	56.5	65.5
The Hawthorns	West Bromwich Albion	3	3	2	8	25	39	32	40
Boelyn Ground	West Ham United	3.5	3.3	2	8.8	20	75	47.5	56.3
Pittodrie	Aberdeen	3	2.2	2	7.2	24	30	27	34.2
Celtic Park	Celtic	2.5	2.2	2.2	6.9	23	34	28.5	35.4
Tannadice	Dundee United	3	2.2	2.2	7.4	19	25	22	29.4
Tynecastle	Heart of Midlothian	3.5	2.2	2	7.7	17	30	23.5	31.2
Easter Road	Hibernian	2	2.3	2.2	6.5	22	28	25	31.5
Caledonian Stadium	Caley Thistle	0.5	2.2	2.2	4.9	16	30	23	27.9
Rugby Park	Kilmarnock	2.5	1.7	1.7	5.9	17	26	21.5	27.4
Fir Park	Partick Thistle	3	2	1.7	6.7	22	25	23.5	30.2
Fir Hill	Motherwell	3	2.2	2	7.2	22	25	23.5	30.7
Global Energy Stadium	Ross County	2	2.1	1.7	5.8	20	26	23	28.8
McDairmid Park	St Johnstone	2	2	2	6	22	23	22.5	28.5
St Mirren Stadium	St Mirren	3	2.1	2	7.1	20	22	21	28.1
Other		3	3	2	8	25	25	25	33

Notes: All data from the BBC Cost of Football Survey 2014 (**?**), whilst averages are computed using own calculations. Prices remain as given in the survey irrespective of whether a team changes divisions. For the four national stadia we use prices based on typical values. Caley Thistle is used as shorthand for Inverness Caledonian Thistle. Ticket price data also matches that used in the main paper.

Table A13: Summary statistics for expenditures

	Mean	s.d.	Min	Max
(a) Football Attendees:				
Unadjusted (log)	6.167	1.138	2.079	10.77
Ticket price adjusted (log)	6.006	1.294	-4.605	10.77
Day out adjusted (log)	5.706	2.305	-4.605	10.77
(b) Full Sample:				
Unadjusted (log)	5.918	1.264	0.000	11.80
Ticket price adjusted (log)	5.914	1.268	-4.605	11.80
Day out adjusted (log)	5.905	1.308	-4.605	11.80

Notes: Adjustments to Office for National Statistics (2015) performed using figures in Table A12

We then run the UQR regressions for the new total day out adjusted measure, reporting the results in Table A14. Attendance at live football only has significant positive impact at the upper end of the distribution, this is entirely consistent with the result in the adjusted expenditure case reported in Table 4 of the main paper. Other variables are very similar in magnitude and direction, providing a robustness to the results reported in the paper. Model fits are very similar and they remain high for quantile regressions.

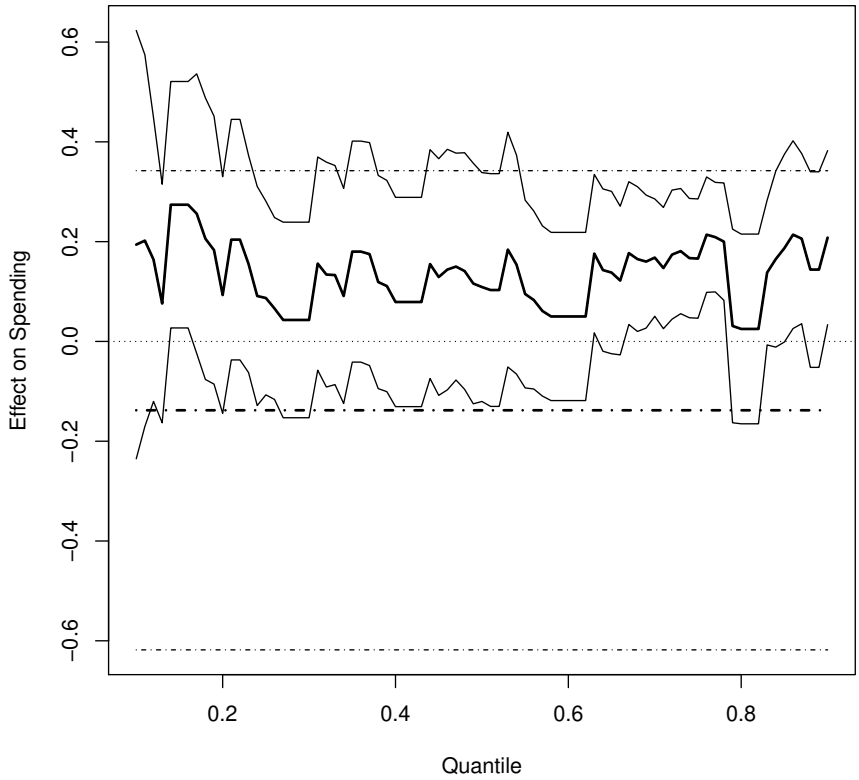
As in the main paper we run the model for 81 quantiles from 0.10 to 0.90 inclusive, using the results from the full set we plot the coefficients on live football attendance across τ. Figure A3 shows strong similarities with Figure 1 of the main paper, the significant effects reported in the paper shown to apply only for limited regions around the stated quantile. Although there was some interest in the OLS coefficient being negative we see that the UQR coefficients are within the confidence interval of those OLS values. There is some variation demonstrated which is then tested using the same seemingly unrelated regression tests applied in Appendix B above.

Table A14: Unconditional Quantile Regression Estimates for Inbound Expenditure in the United Kingdom: Total Day Out Adjusted Expenditure

Variable	Total expenditure						Equality
	OLS	$\tau = 0.10$	$\tau = 0.25$	$\tau = 0.50$	$\tau = 0.75$	$\tau = 0.90$	
Length of stay (log)	0.517***	0.674***	0.428***	0.496***	0.602***	0.673***	110.0***
	(0.031)	(0.050)	(0.028)	(0.043)	(0.041)	(0.084)	
Attend live football	-0.138	0.194	0.087	0.109	0.166**	0.208**	17.75**
	(0.245)	(0.219)	(0.099)	(0.117)	(0.061)	(0.089)	
Male	0.100***	0.102	0.086**	0.117***	0.154***	0.122**	11.09*
	(0.031)	(0.069)	(0.028)	(0.022)	(0.042)	(0.045)	
Air departure	0.558**	1.580*	0.730***	0.536***	0.332**	0.170**	648.2***
	(0.213)	(0.787)	(0.177)	(0.114)	(0.130)	(0.054)	
Aged under 25	-0.016	0.062	-0.073	-0.182***	-0.153*	0.009	63.51***
	(0.062)	(0.140)	(0.041)	(0.045)	(0.071)	(0.065)	
Aged 25 to 64	0.228***	0.571***	0.199***	0.148***	0.134**	0.142**	51.90***
	(0.055)	(0.162)	(0.049)	(0.035)	(0.053)	(0.049)	
Purpose: Holiday	0.470***	1.368***	0.661***	0.471***	0.246*	0.061	121.2***
	(0.042)	(0.145)	(0.081)	(0.035)	(0.119)	(0.098)	
Purpose: Business	0.326*	0.194	0.352**	0.456***	0.535**	0.371**	17.60**
	(0.148)	(0.459)	(0.113)	(0.091)	(0.171)	(0.119)	
Require Visa	0.419**	0.361	0.197	0.352**	0.705***	0.808**	173.9***
	(0.141)	(0.324)	(0.125)	(0.117)	(0.144)	(0.278)	
Group size: 2 people	-0.216***	-0.256**	-0.230***	-0.224***	-0.288***	-0.370***	41.00***
	(0.021)	(0.087)	(0.029)	(0.019)	(0.036)	(0.075)	
Group size: 3 or more	-0.383***	-0.383***	-0.449***	-0.440***	-0.514***	-0.525***	15.34**
	(0.026)	(0.093)	(0.065)	(0.041)	(0.050)	(0.118)	
Influence: Friends	-0.185***	-0.003	-0.163*	-0.212***	-0.237***	-0.277***	44.75***
	(0.047)	(0.131)	(0.085)	(0.059)	(0.045)	(0.079)	
Influence: Guidebook	0.112***	0.253***	0.161***	0.133***	0.080	0.068	25.22***
	(0.033)	(0.032)	(0.021)	(0.030)	(0.052)	(0.090)	
Influence: Website	0.139***	0.181***	0.140***	0.138***	0.119***	0.135*	1.567
	(0.025)	(0.053)	(0.022)	(0.019)	(0.025)	(0.063)	
Influence: Tourist board	0.184***	0.194*	0.132***	0.260***	0.281***	0.036	44.83***
	(0.033)	(0.095)	(0.036)	(0.064)	(0.056)	(0.125)	
Influence: Media	0.049	-0.030	0.050	0.043	0.112	0.146*	3.811
	(0.063)	(0.157)	(0.047)	(0.070)	(0.070)	(0.072)	
Influence: Social media	0.160***	0.326***	0.101**	0.097***	0.168***	0.277***	41.89***
	(0.018)	(0.098)	(0.034)	(0.019)	(0.037)	(0.086)	
Constant	4.238***	0.940	3.620***	4.479***	5.207***	6.020***	
	(0.200)	(0.664)	(0.137)	(0.100)	(0.215)	(0.200)	
Observations	39,525	39,525	39,525	39,525	39,525	39,525	
R-squared	0.215	0.068	0.156	0.189	0.173	0.121	

Notes: *OLS* provides coefficients with robust standard errors. τ denotes the regression quantile at which the UQR is estimated. UQR models fitted with cluster robust standard errors at the region of origin level. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

Figure A3: Impact of Live Football Attendance on UK Inbound Visitor Expenditure Adjusted for Total Day Out Expenditure



Notes: Graph is plotted using the outcomes of the UQR for τ between 0.1 and 0.9 at intervals of 0.01. Solid lines indicate UQR results and horizontal dot-dash lines denote OLS regressions. Coefficients are plotted as thick lines. Confidence intervals are plotted with thinner lines and are constructed at the 95% level to show significance of estimates.

Variable		$\tau = 0.1$				$\tau = 0.25$			$\tau = 0.5$	
	Against	$\tau = 0.25$	$\tau = 0.5$	$\tau = 0.75$	$\tau = 0.9$	$\tau = 0.5$	$\tau = 0.75$	$\tau = 0.9$	$\tau = 0.75$	$\tau = 0.9$
	Length of stay (log)	30.34***	8.770**	2.544	0.000	10.36**	16.88***	6.534*	3.779	2.705
	Attend live football	0.707	0.436	0.025	0.009	0.354	1.773	3.311	0.426	1.027
	Male	0.141	0.085	1.193	0.083	4.841*	5.064*	0.573	2.18	0.015
	Air departure	1.933	2.379	3.147	3.502	7.869**	9.825**	14.603***	7.539**	21.24***
	Aged under 24	1.100	4.463*	8.313**	0.194	9.363**	1.311	1.620	0.348	14.303***
	Aged 25 to 64	7.443**	8.613**	15.12***	8.384**	6.257*	2.333	1.377	0.135	0.035
	Purpose: Holiday	63.677***	52.558***	26.401***	41.998***	5.605*	4.779*	13.055***	4.123*	18.845***
	Purpose: Business	0.201	0.432	0.739	0.178	3.32	2.217	0.032	0.755	1.581
	Group size: 2 people	0.112	0.156	0.143	0.785	0.108	0.94	1.847	1.729	2.66
	Group size: 3 people	1.187	0.745	1.054	0.568	0.111	0.334	0.183	0.719	0.315
	Require visa	0.662	0.002	1.717	1.034	22.811***	17.113***	3.764	9.952**	2.299
	Influence: Friends	6.980**	8.008**	3.170	2.573	2.217	0.511	0.614	0.121	0.315
	Influence: Guidebook	13.56***	16.48***	13.38***	5.329*	0.841	2.446	1.125	3.685	0.977
	Influence: Website	0.891	0.828	1.428	0.405	0.047	0.556	0.005	0.441	0.001
	Influence: Tourist Board	0.789	1.028	0.506	0.636	12.04***	3.713	0.411	0.053	1.810
	Influence: Media	0.453	0.496	1.268	1.229	0.043	2.803	1.654	2.340	1.181
	Influence: Social Media	8.473**	6.871**	2.842	0.084	0.035	1.434	2.467	2.395	3.561

Table A15: Chi-squared tests of parameter equality: Total day out

Notes: Coefficients tests are generated in STATA using seemingly unrelated regressions on the respective recentred influence functio
of the main paper. Significance denoted by $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

References

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