**Attendance Demand in a Developing Football Market: The Case of the Peruvian First Division**

Babatunde Buraimo[[1]](#footnote-2)

J. D. Tena[[2]](#footnote-3)

and

Juan Diego de la Piedra[[3]](#footnote-4)

**Abstract**

**Research question**: Most of the empirical research on football demand has focused on leagues in developed countries while those in developing countries have received comparatively limited attention. In the absence of more specific analyses of leagues in developing countries, an implicit assumption is that demand for football across different economies is homogenous. However, such an assumption may lead to inappropriate policies. Therefore, decision-making and policies aimed at attendance and pricing in developing countries should be substantiated with empirical evidence reflecting their settings.

**Research methods**: This paper models match level attendance demand and price in the first tier of the Peruvian football league from 2012 to 2016 inclusive. Using a sample of 1,719 matches, two-stage least squares estimation with instrumental variables is used.

**Results and Findings**: We find that attendance in the Peruvian football league is driven by market size, distance between teams and recent performance while local rivalry and price do not exert significant impacts. More importantly, attendance exhibits properties of an inferior good given its relationship with levels of poverty and associated correlation with income.

**Implications**: The implications are that demand models for football in developing and developed economies generate different results as the impacts of some exogenous variables on attendance offer different outcomes. For example, the impact of price and income differ from prior expectations indicating that different approaches are necessary to managing football in developing countries including distinct policies on stadium accommodation.

**Keywords:** Attendance, demand, price, football, Peru.

**Introduction**

The sports literature is abundant with articles on attendance demand for football. One of the earliest articles on the subject was by Bird (1982) who adopted a long-run analysis of attendance demand for English football and did so using, amongst others, data on minimum admission price and income. Since then, the number of demand studies has increased substantially; see Dobson & Goddard (2011), Chapter 11, for a discussion of this literature. Accompanying this plethora of studies have been the broader range of contexts and motives for studying football demand. The ever-increasing access to data and information across many football leagues have meant that a variety of issues have been explored including the impact of broadcasting and the effects of market size to name but two (Buraimo, Forrest & Simmons, 2009; Forrest & Simmons, 2006).

A common feature of many of studies is that they tend to focus on established football leagues in developed economies (Serrano, García-Bernal, Fernández-Olmos, & Espitia-Escuer, 2015; Buraimo & Simmons, 2009). Leagues in developing countries have not had the same level of attention and whilst stadium demand for football may have common features, there are likely to be substantial differences if, for example, demand for football in a developed country like Spain is compared with a developing one like Peru. Therefore, management decision-making and policy initiatives that may be appropriate in a developed economy may not necessarily be apt for a developing one. In developing economies, stadium accommodation is likely to be rudimentary with poor facilities. Safety and security are unlikely to be as sophisticated as those in developed economies, and football is unlikely to reflect and exude the affluence of a leisured society. Football demand may be an inferior good in contrast to its counterpart in developed economies which is generally reported to be a normal good.

The purpose of this study is to examine the demand for football in a developing country: the Peruvian first division (Torneo Descentralizado de Futbol Profesional or TDFP). The rest of this study is organised as follows. The next section examines the notion of established and emerging football markets in developed and developing countries. This is followed by an examination of the case of Peruvian football in which its nuances and peculiarities are highlighted. This is followed by commentary on the data and variables used in the analyses. Thereafter, a description of the modelling process is presented. This is followed by a discussion of the results. The penultimate section discusses the policy implications of the results, and the final section offers concluding remarks on the management decision-making and policy initiatives required for a developing football economy.

**Football Markets and Economic Development**

An effective approach to understanding football markets across different parts of the globe including the subject country, Peru, is to consider whether the market for football is one that has a strong heritage and whether it is very well-established or by contrast, is emerging. A further consideration is whether the market for football is in a developed or developing country.

The framework that follows shows that it might be necessary to assign football markets to different categories prior to making judgements about how attendances and prices are likely to be affected by a range of economic and market conditions. The context for assigning countries to categories relating to *developing* and *developed* are very well established. Agencies such as the Organisation for Economic Co-operation and Development (OECD) and the United Nations routinely classify economies into various categories depending on the analysis and subject of inquiry (risk classification, aid, repayment, etc.). Whilst the range of categories may vary, for the purpose of our analysis, the categories of developed and developing are in line with the OECD’s classifications of countries into category I and II.

***Developed Football Markets in Developed Economies***

Starting with a well-established football market in a developed country, football in England and other western European countries typify this group. For example, the professional football league in England was established 1888 with 12 clubs. This was followed by many developments which included the formation of the governing body, the Football Association (The FA), in 1863 and the emergence of more football clubs in the years that followed (Russell, 1997). Decades of further developments including league expansion have resulted in 92 professional football clubs across four tiers integrated by promotion and relegation. Another significant feature is the ability to penetrate other countries and generate substantive non-domestic revenues which are often used to attract the world’s best players. The above description not only characterises the biggest five football markets in Europe (England, Spain, Germany, Italy and France) but also smaller football markets such as those in the Netherlands and Portugal. In these countries, the market for stadium attendance has matured and there is typically limited scope to substantially maximise attendance. Management practices and policies are typically directed towards delivering higher quality products with the view of extracting higher revenues per unit consumer, i.e., the upgrade of stadium facilities aimed at corporate consumers who are less sensitive to higher prices. Policies are also aimed at competing against other leagues and other clubs in the global market.

***Developing Football Markets in Developed Economies***

Not all developed countries have a legacy and heritage of (association) football. Australia, Canada, Japan, New Zealand and the United States are examples of developed countries with emerging, rather than developed, football markets. Football in these countries is effectively a minor sport even if professional leagues are present. Other sports are more likely to dominate national attention. For example, in the United States, the National Football League (NFL) and Major League Baseball (MLB) are two of the dominant professional sports leagues. Football in these developed countries is an emerging sport and professional leagues are relatively infant sectors of the sports industry. In some cases, football may have been established over many decades, but its development as a professional sport is likely to have been punctuated with breaks and cessation in league football. Furthermore, today’s global market for sport means that emerging football market (may) face intense competition from televised football of developed football markets from developed countries. For example, the English Premier League is televised in over 180 countries (Premier League, 2017). Additionally, there is the likelihood that the very best football players that are the product of any youth development in emerging football markets are lost to those established football markets in developed countries where earnings are higher. Attendance demand for football in these countries is less likely to be affected by issues such as income and security but more by the quality of the match and by tastes and preferences.

***Developing Football Markets in Developing Economies***

Emerging football markets in developing countries include countries like China, Singapore and India. Like emerging football markets in developed countries, football is unlikely to be the national sport and professional football leagues are likely to be recent phenomena. For example, football in India has been long established but had limited traction amongst sports fans. The first professional football league started in 1996 (Hay, 2003) but the current professional league, the India Super League, was founded in 2013. In these cases, football leagues must compete with other more established sports, and given that culture, traditions and tastes are highly persistent over time, it is unlikely that a developing football market can rival incumbent national sports or well-established leagues.

There are demand studies of developing football in developing countries. For example, Sim (1995) and Watanabe & Soebbing (2015) examined the demand for the top tier football in Malaysia and China respectively. However, these are not directly comparable with our analyses, not only because of the differences in the econometric approach but also because they focus on countries where football is emerging.

***Developed Football Markets in Developing Economies***

Football is the most popular sport in Latin America and countries like Brazil, Columbia and Argentina have rich histories. Economic development in these countries has influenced the way football has developed. For example, professional football in Brazil is well-established, however, its development has been heavily influenced by politics; public subsidies have been used to fund the development of many stadia in the past (Holzmeister, 2014).

The importance of economic variables and stadium infrastructure has been, at least, partly captured by Ferreira and Bravo (2007) and Madalozzo & Villar (2009) in their analysis of Chilean and Brazilian professional football leagues respectively. Interestingly, Madalozzo & Villar (2009) found that per capita income exerted a negative impact on attendance which suggests that football in Brazilian is an inferior good. Ferreira & Bravo (2007) also found that stadium capacity increases the expected attendance to the football match. We advance on their study by including information on market size and variables that management can influence.

Another example of an analysis of attendance demand in a developing Latin American country is a study by Rocha & Fleury (2017). Using a survey, they estimated the relative importance of different types of personal, social and economic constraints in explaining willingness to attend matches in Brazil. Although the study examined football attendance in a developing country, it focused on the intention to attend rather than revealed demand.

The fact that demand for football can be restricted by lack of economic development and poor infrastructure in these countries make their analysis particularly interesting. Given this, the assumption that different types of football markets across different economies are similar, should not be made and demand for football should be formally investigated.

**The Peruvian Primera Division**

The principal interest of this study is the demand for football in Peru, and this characterises a well-established football market in a developing country. According to the OECD and the Human Develop Index (HDI), Peru is a developing economy. In 2015, it was 87th in the HDI ranking. It is also a dynamic economy with an average GDP yearly growth rate of 1.3% from 2002 until 2017. According to the World Bank, the percentage of population living below the national poverty line has substantially declined in recent years from 58.7% in 2004 to 20.7% in 2016. However, poverty levels are still high compared to western standards.

The Peruvian Primera División, Torneo Descentralizado de Futbol Profesional (TDFP), is the top tier of the Peruvian football. It comprises 16 clubs and like many leagues, it operates a system of promotion and relegation with the worst performing teams relegated to the second tier. Promotion to the first tier is typically based on performances in the second tier but also on performances in other competitions such as Copa Peru. The clubs are widely dispersed across the country and the mean distance between stadia is approximately 900 kilometres. The two biggest and most dominant clubs are Universitario and Alianza de Lima and both are located in the capital Lima. The two clubs have won a combined total of 48 of the 97 league titles contested. Uniquely in Peruvian football, both clubs also own their own stadia reflecting their dominant positions with respect to market size and access to resources. The principal management approach in Peruvian football when it comes to stadium accommodation is for clubs to rent from their municipalities. For this reason, the league has in the past been beset with organisational issues around stadium management. Since the stadia are not owned by the clubs, it is common for matches to be postponed by municipalities for reasons of safety, security and administrative problems.[[4]](#footnote-5)

The football season runs from February to December, however, the format of the competition has seen changes from one year to the next. The present analysis covers two distinct periods. The first of these is for the 2012 and 2013 seasons in which the league operated a round-robin tournament in the early part of the season. Clubs played one another, once at home and once away, and the best performing teams qualified for the Copa Libertadores. Two groups of eight teams were subsequently created and the best performing team from each group played a final playoff match to decide the national champion. In the second period from 2014 to 2016, the championship was split into “Apertura” and “Clausura”. The former was the first half of the season and the latter was the second half of the season. The best team in the first half of the season and the best team in the second half of the season advanced to the playoff along with two other teams to decide the league champions. The relegated teams were the worst performing teams based on the aggregation of performances in Apertura and Clausura.

The restructuring of the league suggests that the league administrators are in search of the optimum configuration and whilst there may be a multiplicity of incentives, a standard justification for league policies is maintaining uncertainty of outcome and it is likely that the Peruvian league uses uncertainty of outcome as a defence for its restructuring policies. The uncertainty of outcome hypothesis has been a regular feature in the literature. Although the conjecture is intuitive, the empirical findings are ambiguous. For example, Brandes & Frank (2007), Buraimo & Simmons (2009), and Czarnitzki & Stadtmann (2002) each find that match uncertainty of outcome does not influence stadium attendance demand. If anything, stadium attendances responded to greater levels of certainty, particularly when the home team was likely to win. Given the differences between developing and developed economies, it will be interesting to observe the preferences of Peruvian football fans with respect to uncertainty of outcome.

**Data and Variables**

Our data set comprises individual matches for the seasons 2012 to 2016 inclusive. The dependent variables, average price and stadium attendance, are modelled as functions of covariates across socioeconomic, demographic, geographical, sporting and market-specific groups. The source of the two dependent variables, along with other relevant sporting data, is the Professional Peruvian Football Association. Initially, the number of matches in the sample was 1,792 but some matches were played behind closed doors. Deleting these, the number of observations was reduced to 1,719. The economic and demographic data were obtained from the Peruvian National Institute of Statistics.

We construct a wide range of variables. The first of these is market size. Market size is an important feature of the sports economics literature and generally viewed as a fundamental feature of how sports markets operate (see Quirk and Fort (1992) for a stylised version of the impact of market size and Buraimo et al. (2007) for empirical demonstration). Previous studies have captured market size by using different measures and configurations of population data. For example, Buraimo, Forrest & Simmons (2009) use the population within a 10-mile radius of the home team’s stadium. In this analysis, the population of the municipality in which the home team is based is used to capture the market size. The approach adopted in this study is dictated by the type of data available. Unlike Buraimo et al (2009) in which population data for output areas are used, the population data in this study is at a higher geographical level (regional).[[5]](#footnote-6)

The strength of the teams’ foothold in the football market is also taken into account in that teams that have been in the Peruvian top league longer may have a propensity to charge higher prices. Also, a presence in top flight football may allow the teams to acquire greater support and interests over time. Hence *home years in the top* *tier* and *away years in the top tier* are included and are the number of years that the teams have been in the top tier.

With respect to team quality, information on club expenditure and budgets is not available. Moreover, budgets could underestimate the gap between big and small clubs particularly if talented players prefer to play for bigger and more glamorous clubs at a wage below what a competitive market would offer. Instead, we consider home and away points per game up to but before the current match as alternative indicators of the quality of the home and away teams and their form across the season. Additionally, the momentum of the home team is accounted for by considering the performance of the home team in its previous match. Two dichotomous variables are included: *home team previous victory* and *home team previous draw*.

An income measure, *log per capita earning,* and proportion of individuals considered to be in poverty in the home team region, *poverty proportion*, are used in the analysis to estimate the importance of macroeconomic conditions on the decision to attend football matches. The *poverty proportion* is the proportion of individuals that fall below a threshold set by the Peruvian National Statistical Office and this threshold is the minimum level of consumption deemed necessary for survival. Although these variables are observed annually, they offer insights into the potential effects of earnings and wealth on attendance demand.

A number of football-specific variables are included. These variables are: a dummy variable *weekday* if the matches take place between Monday and Friday inclusive; a dummy variable *playoff* to capture whether the match is a regular season or a playoff match; a dummy variable *derby* that takes the value of one if the home and away team are from the same city and 0 otherwise; and a dummy variable *national stadium* that takes the value of one if the match was played at the National stadium, Estadio Nacional de Lima, as oppose to the home team’s regular stadium. With respect to venue, at times teams play their home matches at alternative venues. A dummy variable, *not main stadium*, is intended to capture this effect. We also include distance between the two clubs and expect that as distance increases, attendance will fall.

Finally, as is typical in the sports economics and management literature, indicators of competitiveness are included to capture the potential interest in close contests. Rothenberg (1956) in his seminal paper motivates this issue by explaining that attendance will depend on how competitive the contests are. Rottenberg’s conjecture is known as the uncertainty of outcome hypothesis. Many papers have empirically tested the hypothesis with mixed results. For examples, see Peel & Thomas (1992), Forrest, Beaumont, Goddard & Simmons (2005), Buraimo & Simmons (2008) and Hogan, Massey & Massey (2017). As is now common in the literature, many of these papers use betting odds (see [www.oddsportal.com](http://www.oddsportal.com)) to construct probabilities for each match outcomes. In converting the odds into probabilities, the bookmakers’ overound is accounted for and the odds for a home win, draw and an away win sum to one. We follow Peel & Thomas (1992) and compute the Theil measure to capture uncertainty of match outcome. This variable makes use of the probabilities across all three match outcomes and is derived using:

where is the probability of outcome . Additionally, we take account of the potential asymmetric relationship between expected match outcome and attendance by also including home win probability as an explanatory variable. The summary statistics for the dependent and independent variables are presented in Table 1.

(Table 1, near here)

**Model**

The two models that we specify are for (log of) price and (log of) attendance as linear functions of the covariates. In addition, the attendance model includes a lag to deal with first-order autocorrelation as attendance is not independent of the previous match’s. Furthermore, we include fixed effects for season and for the home and away teams to address unobserved heterogeneity.

It is important to assess whether price and attendance are stationary series and whether any relationship between them is a result of non-stationarity. If the variables exhibit this property, any correlation or causality is likely to be because the two variables have the same trend and any inferences might, therefore, be spurious. An ad hoc inspection of the time series for (log of) prices and (log of) attendance show no obvious trend. This suggests that the variables are stationary around their mean values. More formally, the Augmented Dickey-Fuller test for the presence of unit roots was used. The null hypothesis of non-stationarity is rejected at the 1% level of significance with a *t-statistics* of 14.24 and 12.50 respectively (critical value of 3.46).

Another relevant issue regarding the attendance variable concerns the possibility that attendances could be constrained by stadium capacity. As noted earlier, if this were the case, measures of attendance will not reflect consumer demand but simply the size of the stadium. Figure 1 shows the histogram of the ratio attendance to stadium capacity. It shows that the distribution is asymmetric with most of its mass within the range that suggests that attendance is well within the stadium capacity limits.

(Figure 1, near here)

The decision to attend matches is contemporaneous as tickets are sold on a game by game basis rather than as a bundle (season tickets). Although this presents potential endogeneity in the price variable, it provides a rich environment for understanding and estimating how price adjusts to a series of factors.[[6]](#footnote-7) It also offers a setting for analysing how demand responds to changes in price. Very few demand studies have been able to separate season ticket demand from walk-on (Allan & Roy, 2008). One advantage offered in the present study is that virtually all attendances are walk-ons so the effects of price can be estimated with greater precision.

The endogeneity of price is dealt with by means of instrumental variable regression. We follow a long tradition in the literature on dynamic panels and use lagged values of the potentially endogenous variable as instruments (see for example Arellano & Bond (1991)). We use lag values of the log mean price, the log mean price from the previous match, and the match prior to that, as these variables are likely to be correlated with the log price but uncorrelated with log attendance for a given match. The price and attendance models are noted in equations (1) and (2) respectively.

$Ln\left(p\_{h,a,g}\right)=α\_{0}+α\_{1}p\_{h,g-1}+α\_{2}p\_{h,g-2}+α\_{3}Ln\left(A\_{h,g-1}\right)+α\_{4}^{'}X\_{h,a,g}+γ\_{h}+δ\_{a}+ρ\_{s}+ε\_{h,a,g}$ (1)

where $p\_{h,a,g}$ is the price of the match between the home team, $h$, and the away team, $a$, in game $g$. $X\_{h,a,g}$ is a vector of the covariates described in the previous section, $p\_{h,g-1}$ and $p\_{h,g-2}$ are the lagged prices in the previous two matches. We also include $Ln\left(A\_{h,g-1}\right)$, the log of the attendance in the previous home match to capture the effect of previous attendance on pricing decision, and $α\_{i}$ for *i* = 0 to 4 are the associated parameters to the variables in the model. The final three covariates, $γ\_{h}$, $δ\_{a}$ and $ρ\_{s}$, are the fixed effect variables for the home team, the away team and season respectively. Finally, $ε\_{h,a,g}$ is the stochastic error term.

For the attendance model, we have

 $Ln\left(A\_{h,a,g}\right)= β\_{0}+β\_{1}Ln\left(\hat{p}\_{h,a,g}\right)+β\_{2}Ln\left(A\_{h,g-1}\right)+β\_{3}X\_{h,a,g}+γ\_{h}^{'}+δ\_{a}^{'}+ρ\_{s}'+ε\_{h,a,g}^{'}$ (2)

where $Ln\left(A\_{h,a,g}\right)$ is the log of attendance between the home and away teams in game $g$ and $Ln\left(\hat{p}\_{h,a,g}\right)$ is the expected value of price estimated and derived from equation (1). Fixed effects, associated parameters and the error term are defined similarly to equation (1).

The coefficients that accompany equations (1) and (2) are jointly estimated using two-stage-least squares and as such, the estimated values of price derived from equation (1) are used in equation (2). Finally, the lagged values of attendance from the previous match,$ Ln\left(A\_{h,g-1}\right)$, are included to capture habit persistence in which past attendance drive current admission levels.

**Results and Discussions**

The regression models for price and attendance showing the effects of the various independent variables are presented in Tables 2 and 3. The impact of these variables on price and match attendance is very interesting. The first thing to note is that the instruments used in the regression model for price (the log of price from the previous match and the match before that) are jointly significant at the conventional levels. Moreover, from an econometric perspective, the low values of the parameters of lagged attendance in the two equations (-0.02 and 0.03 for the price and attendance regressions respectively) clearly suggest stationarity and therefore validating the use of standard regression models. From a theoretical standpoint and for the attendance model, current attendances are not affected by attendance in previous matches and habit persistence is not a feature of Peruvian football, contrary to what has been found in European football leagues (Buraimo, Paramio, & Campos, 2010).

Regarding our independent variables, some of the estimated parameters are consistent with prior expectations. However, there are some interesting features that should be noted. The number of years that the teams have been in top flight football does not have any significant impact on attendance. In the price model, the number of years that the away team also has no effect, however, the number of years that the home team has been in the top tier does have a significant effect. The results indicate that market size has a positive influence on attendance; if population increases by one million expected attendance will increase by 20%. As with other professional sports and football leagues, the Peruvian league is positively influenced by market size and teams in larger municipalities can expect to attract greater attendances affording them an advantage over others when it comes to generating revenues. Increased market size, however, does not influence the price of tickets set by the football clubs.

Our measures which capture the quality of both the home and visiting teams, *home points per game* and *away points per game*, are not significantly different from zero suggesting that attendance does not respond to the current performances of either team. As these measures capture elements of team quality as well as team performance this is surprising and a departure from findings in the standard literature; see for example Dobson and Goddard (1992). The *home points per game* measure does, however, positively influence the price set by the home team. It seems that it is clubs’ policy to extract revenue from supporters and fans in the presence of strong performance.

(Table 2, near here)

For dichotomous variables, the reported relative impacts on attendance and price are computed using the transformation proposed by Halvorsen & Palmquist (1980) as the coefficients in regressions provide incorrect estimations of this impact. If the home team has been victorious in its previous match or has drawn it, attendance improves by 19.7% indicating that fans and supporters of the home team value the most recent result. This is somewhat reflected in the prices that are charged; a victory in the previous match means that the clubs will increase price on by 6.2% although clubs do not seem to increase prices if the team had drawn its previous match all other factors being held constant.

Attendance demand responds strongly to the playoff dummy. Audiences respond positively to post-season games where the significance of outcomes is greater than for regular season. Whilst regular team matches are important, their relevance is somewhat limited compared with the prospect of seeing the team in the playoffs with the possibility of becoming champions. Remarkably, attendances are 132% greater for a playoff match compared to a regular season match and this is reflected in the marginal increase in price of 73%. This suggests that in order to maximise attendance and associated revenue, the league needs to carefully consider the competition structure. Having experimented with different league configurations, the optimum structure, if realised, can generate substantial levels of revenue for the home teams.

(Table 3, near here)

The dummy variable *weekday* has a significant, negative impact on price but the impact on attendance, although also negative, is only marginal at the 10% level. This indicates that attendances on weeksdays are significantly lower than those at the weekend but the level of confidence in this result is small. Notwithstanding this, the prices for weekday matches is 16.2% less than those charged for weekend matches.

Derby matches have proved to be an important feature in league football. In English and Spanish football, for example, derby matches have been noted to improve attendances by up to 13% (Buraimo et al.,2010; Buraimo & Simmons, 2009). *Local derby* is not significant in either equation which indicates that rivalry is not a significant factor in the decision to attend football matches and nor does it influence pricing.

Our results suggest that attendees respond positively to matches played in the National Stadium which has the highest quality insofar as accommodation is concerned. In this regard, it is relevant to explore factors associated with stadium accommodation. In instances where matches are played at a different venue to the home team’s regular stadium, attendances are adversely affected. The findings of the analysis suggest that Peruvian football should consider policy and management decisions aimed at improving stadium quality and security in order to increase attendance. The significant coefficient of the variable *not main stadium* suggests that supporters respond negatively to what is an inconvenience. Moving a match from the main stadium to an alternative venue reduces attendance at the mean by 43%. This suggests that stability, familiarity and the prestige of being at home are important to fans. On this basis, improvement in the quality of accommodation and for such accommodation to be available routinely is desirable. Surprisingly, when matches are played at an alternative stadium, clubs are less inclined to reduce prices and the inconvenience of fans is not accounted for in pricing policies.

Similar to European football studies, as the distance between the two teams increases, so the level of attendance demand falls. This is capturing the additional burden of time and travel costs that supporters and fans of the visiting team have to face. We test the non-linearity of distance by including the square of distance. However, this was not significant so the effect of distance is deemed linear. The influence of distance on price is negative. Clubs reduce prices as the distances between the two clubs increase.

We do not find evidence in favour of any impact of uncertainty of outcome on attendance. Additionally, any notion of uncertainty of outcome influencing price is rejected. The lack of support for uncertainty of outcome adds to the growing body of literature discussed in previous sections that generally does not find in its favour. Whilst much of the literature on uncertainty of outcome is based on leagues in developed economies, the lack of support for the hypothesis in a developing market suggest that preferences of fans regarding uncertainty are similar regardless of the market economy.

Once we control for endogeneity in the attendance model, price does not have any significant impact on attendance. However, indirect price (or cost) for away supporters such as distance between the clubs exerts a significant and negative impact on attendance and price. A similar result for attendance demand was found in Buraimo et al. (2009) for the English Championship (tier 2). The result of zero price elasticity of demand may seem peculiar. However, if the absolute prices are low, then increases in such low prices are unlikely to have any significant impact on attendance demand. Simply put, the range of prices that are observed in the data are such that the size of any reasonable increment is too low to cause any significant effect on fans and supporters willingness to attend matches. Such a phenomenon has been previously observed in the leisure demand literature (Coalter, 1993). This finding suggests that at the margins, clubs can increase prices without any significant adverse effect on attendance. Note that the marginal elasticity being considered here is the short-run elasticity. However, if we derive the long-run elasticity of attendance with respect to price, which can be estimated from the first column of equation (1) (as 0.31/(1 - 0.03) = 0.32, F-statistic = 0.48 and *p-value* = 0.48), it is still not significant.

The estimation of income elasticities of demand is highly relevant for a developing country like Peru. We find that the impact of per-capita earnings is not significantly different from zero while the measure *proportion poverty* which measures the proportion of the population below the set threshold for poverty exerts a significant positive impact on stadium attendance. The interesting feature of this particular result is that what is significant is whether individuals are above or below a specific threshold. Whilst the results do not lend themselves to estimating income elasticity, the estimations are indicative of football in Peru being an inferior good. This result is similar to the findings of English football prior to the 1980s; Bird (1982) reported an income elasticity was -0.64 for English football in his analysis of English football from 1948 to 1980. Subsequent studies (Dobson & Goddard (2011), Dobson & Goddard (1996) and Simmons (1996)) have attempted to provide technical explanations of why the measure of elasticity was negative including matters such as non-stationary income and attendance series that generates a spurious negative relationship estimation in the model. However, they found no evidence to support the notion that English football was historically a normal good. In fact, it is plausible to accept that prior to the eighties, English football was an inferior good characterised by hooliganism, lack of safety and security, and poor accommodation emphasising the poor quality of the product as a leisure commodity. In this regard, Peruvian football is likely to be an inferior good beset by problems similar to those found in English football in the 1970s and 1980s.

**Policy Implications**

Our study of the demand for football in Peru provides insights on decision-making for markets in which the settings are different to the norms of European sports leagues. For policies to be portable across different contexts, the markets must have similar properties. The analysis in this study shows that policies and decision-making may not be easily transferred from developed countries to developing ones. Taking the matter of price as an example, the management literature of the impact of price on football has generally reported a negative impact (Garcia & Rodriguez, 2002). However, the findings of this study show that price does not have any significant effect. This is contrary to findings that would be normally be expected in developed markets highlighting that pricing decision should not necessarily follow those observed in developed countries.

Policies around accommodation should also reflect the context of the specific market. In particular, the fact that football demand reacts positively to matches located in the renovated National Stadium with improved facilities such as hospitality boxes, parking spaces and panoramic restaurants suggests that decisions aimed at improving stadium quality may be positively appreciated by consumers. From a financial perspective, the cost of such provisions will need to be weighed up against the increases in demand and revenue.

Additionally, we find that the demand characteristics of football in a developing economy are different from what the literature general reports for developed economies (Forrest and Simmons, 2006). Our proxy for income, earnings per capita, had no impact on demand, however, another measure, the proportion of individuals that fall below a threshold for poverty, does. Whilst this does not render football in Peru an inferior good (using the strictest definition that would be applied by economists), the fact that demand is directly proportional to the levels of poverty is indicative. Further to the inferior good property of football in Peru, there are low standards of safety and security, postponement of matches is frequent, and stadium operators are not always able to host football matches for the home team. Such issues and problems suggest that the market for football is lacking the necessary standards for a normal or luxury good.

**Concluding Remarks**

Our study of demand offers a very interesting perspective of sport in a developing country. It is necessary for studies of a) developed football markets in developing countries, b) of developing football markets in developed countries, c) of developing football markets in developing countries, and d) developing football markets in developed countries, to offer a wider perspective on how a range of factors affects the demand. Doing so will allow managers to develop relevant policies for their own setting.

Whilst the analysis shows that demand for football in Peru is different from those in Europe, there are some similarities that are noteworthy. Demand responds positively to the performances of the home team and the most recent positive results. The effects of market size are also similar to those that are generally reported in the literature previously discussed. Some of the factors that are specific to football have a similar effect in our models to those that might be found in many studies. However, the impact of price and income depart from what would normally be reported in the literature for a developed economy. The consequence and policy implications for managers is that football in developing countries may need to be managed differently from those of developed countries.

**Acknowledgements**

We would also like to thank the editor and reviewers for their comments which have helped improve the manuscript. We would like to thank James Reade for advice on sourcing data. We would also like to thank participants of the XII Gijon Conference on Sports and Consumer Behaviour.

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**Figure 1.** Ratio attendance to stadium capacity

**Table 1.** Descriptive Statistics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | Mean | Standard deviation | Minimum | Maximum |
| Ln(attendance) | 7.84 | 1.06 | 3.83 | 10.75 |
| Ln(price) | 2.31 | 0.6 | -0.17 | 4.19 |
| Home years in the top tier | 28.48 | 29.84 | 0 | 97 |
| Away years in the top tier | 28.47 | 29.82 | 0 | 97 |
| Home population (in millions) | 3.07 | 4.21 | 0.04 | 9.9 |
| Home points per game  | 1.16 | 0.49 | 0 | 6.4 |
| Visitor points per game  | 1.19 | 0.48 | 0 | 5 |
| Home team previous victory | 0.25 | 0.43 | 0 | 1 |
| Home team previous draw | 0.26 | 0.44 | 0 | 1 |
| Proportion poverty | 0.31 | 0.16 | 0.14 | 0.59 |
| Ln(per capita earning) | 6.52 | 0.27 | 6.14 | 6.96 |
| Weekday | 0.33 | 0.47 | 0 | 1 |
| Playoff | 0.02 | 0.12 | 0 | 1 |
| Local derby | 0.07 | 0.25 | 0 | 1 |
| National stadium | 0.03 | 0.18 | 0 | 1 |
| Not main stadium | 0.17 | 0.38 | 0 | 1 |
| Distance (in 100s of km) | 8.71 | 5.5 | 0 | 24.42 |
| Home win probability | 0.50 | 0.12 | 0.13 | 0.81 |
| Uncertainty of outcome | 1.00 | 0.09 | 0.61 | 1.10 |
| Observations | 1769 |

Price and earnings are in Peruvian Pesos.

**Table 2**. Determinants of price. Dependent variable is ln(price)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Independent variable | Coefficient | T-statistic | Coefficient | T-statistic |
| Lag log attendance | 0.02 | 1.2 | 0.02 | 1.20 |
| Lag log price | -0.02 | -0.83 | -0.02 | -0.82 |
| Second lag log price | 0.06\*\*\* | 3.02 | 0.06\*\*\* | 3.03  |
| Home years in the top tier | -0.17\* | -1.67 | -0.17\* | -1.67  |
| Away years in the top tier | -0.08 | -0.81 | -0.08 | -0.82 |
| Home population  | -4x10-8 | -0.9 | -4x10-8 | -0.89 |
| Home points per game  | 0.06\*\* | 2.37 | 0.02 | 0.6 |
| Visitor points per game  | 0.02 | 0.62 | 0.02 |  0.61 |
| Home team previous victory | 0.06\*\*\* | 2.62 | 0.06\*\*\* | 2.61  |
| Home team previous draw | 0.03 | 1.46 | 0.03 | 1.45  |
| Proportion poverty |  |  | -0.69 | -1.00 |
| Ln(per capita earning) | 0.54 | 1.12 |   |   |
| Weekday | -0.15 \*\*\* | -7.26 | -0.15\*\*\* | -7.28  |
| Playoff | 0.55\*\*\* | 7.17 | 0.55\*\*\* |  7.16  |
| Local derby | 0.08 | 1.69 | 0.08\* | 1.7  |
| National Stadium | 0.28\*\*\* | 4.07 | 0.28\*\*\* | 4.04  |
| Not main stadium | 0.02 | 0.51 | 0.02 | 0.57 |
| Distance  | -0.01\*\* | -2.21 | -0.01\*\* | -2.21  |
| Home win probability | 0.16 | 0.72 | 0.16 | 0.73 |
| Uncertainty of outcome | -0.06 | -0.26 | -0.06 | -0.24 |
| Adjusted R-squared | 0.98 | 0.98 |
| Observations | 1719 | 1719 |

\*, \*\* and \*\*\* indicate significance at the 10, 5 and 1% levels.

**Table 3**. Determinants of attendance demand.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Independent variable | Coefficient | T-statistic | Coefficient | T-statistic |
| Lag log attendance | 0.03\* | 1.84  | 0.03\* | 1.81 |
| Expected log price | 0.31 | 0.69 | 0.29 | 0.7 |
| Home years in the top tier | 0.04 | 0.27 | 0.04 | 0.25 |
| Visitor years in the top tier | 0.20 | 1.38 | 0.20 | 1.41 |
| Home population  | 2x10-7\*\*\* | 4.34  | [3x10](file:///C%3A%5C%5CUsers%5C%5Cburaimo%5C%5CAppData%5C%5CLocal%5C%5CMicrosoft%5C%5CWindows%5C%5CINetCache%5C%5CContent.Outlook%5C%5C0PWU374J%5C%5Ctables.xlsx%22%20%5Cl%20%22RANGE%21A29)[-7](file:///C%3A%5C%5CUsers%5C%5Cburaimo%5C%5CAppData%5C%5CLocal%5C%5CMicrosoft%5C%5CWindows%5C%5CINetCache%5C%5CContent.Outlook%5C%5C0PWU374J%5C%5Ctables.xlsx%22%20%5Cl%20%22RANGE%21A29)\*\*\* | [4.5](file:///C%3A%5CUsers%5Cburaimo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C0PWU374J%5Ctables.xlsx#RANGE!A29) |
| Home points per game  | -0.01 | -0.30 | -0.01 | -0.27 |
| Visitor points per game | 0.02 | 0.41 | 0.02 | 0.40 |
| Home team previous victory | 0.18\*\*\* | 4.22  | 0.18\*\*\* | 4.27 |
| Home team previous draw | 0.07\*\* | 2.08  | 0.07\*\* | 2.11 |
| Proportion poverty |   |   | 2.03\*\* | 2.00 |
| Ln(per capita earning) | -0.72 | -1 |  |  |
| Weekday | -0.14\* | -1.86  | -0.14\* | -1.88 |
| Playoff | 0.84\*\*\* | 3.09  | 0.84\*\*\* | 3.10 |
| Local derby | 0.11 | 1.51 | 0.11 | 1.48 |
| National Stadium | 0.92\*\*\* | 5.71  | 0.94\*\*\* | 5.87 |
| Not main stadium | -0.36\*\*\* | -6.93  | -0.36\*\*\* | -7.06 |
| Distance  | -0.01\*\* | -2.47  | -0.01\*\* | -2.50 |
| Home win probability | 0.25 | 0.77 | 0.24 | 0.76 |
| Uncertainty of outcome | -0.40 | -1.17 | -0.41 | -1.19 |
| Adjusted R-squared | 0.76 | 0.76 |
| Observations | 1719 | 1719 |

\*, \*\* and \*\*\* indicate significance at the 10, 5 and 1% levels.

1. Corresponding author: Management School, University of Liverpool, Chatham Building, Chatham Street, Liverpool, L69 7ZH, United Kingdom. ++44 0151 795 3536, b.buraimo@liverpool.ac.uk. [↑](#footnote-ref-2)
2. Management School, University of Liverpool, Chatham Building, Chatham Street, Liverpool, L69 7ZH, United Kingdom. ++44 0151 795 3616, jtena@liverpool.ac.uk; and Università dei Sassari, Piazza Università, 21, 07100 Sassari SS, Italy. [↑](#footnote-ref-3)
3. Management School, University of Liverpool, Chatham Building, Chatham Street, Liverpool, L69 7ZH, United Kingdom. hsjdelap@liverpool.ac.uk. [↑](#footnote-ref-4)
4. We found many examples of this in local newspapers. For example, El Comercio report that six matches were postponed for security reasons (<http://elcomercio.pe/deporte-total/futbol-peruano/cristal-aurich-otros-duelos-atrasados-falta-garantias-311711>). Also, the match between Universitario and Alianza de Lima in November 2016 was also suspended (<http://webcache.googleusercontent.com/search?q=cache:http://larepublica.pe/deportes/818413-se-suspende-el-clasico-entre-universitario-y-alianza-lima>). [↑](#footnote-ref-5)
5. The output areas in Buraimo et al. (2009) are the most detailed enumeration level available from the census survey and each output area comprises approximately 200 households therefore offering a detailed and granular analysis of market size. [↑](#footnote-ref-6)
6. Garcia & Rodriguez (2002) are one of the few exceptions to this practice. [↑](#footnote-ref-7)