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The Portuguese case 1970-1999”**

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NIPE WP 1 / 2006

NÚCLEO DE INVESTIGAÇÃO EM POLÍTICAS ECONÓMICAS
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TITLE

“The importance of the regional development on the location of professional soccer teams. The Portuguese case 1970-1999”

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TITLE

“The importance of the regional development on the location of professional soccer teams. The Portuguese case 1970-1999”

ABSTRACT

This work aims at testing the hypothesis “The economic development level of a region influences the presence of professional soccer teams in the country’s first league, which have their head offices in that region”. Using a rational choice model and working with binary time-series cross-section data, this work focuses on the Portuguese case, from 1970 to 1999. The results corroborate the main importance of three factors, which increase the probability that a municipality has the head office of a team that plays in the first league: the per capita revenue, the level of infrastructures and the demographic dimension.

Key-words: Regional development; Sports; BTSCS; *logit* models

JEL CODES:R11; R33; L83

1. Introduction

The present study aims at testing the hypothesis “The economic development level of a region influences the presence of professional soccer teams in the premier league of Portugal which have their head offices in that region, ”.

The structure of costs of a certain sport team depends on its own ambition. This fact is intrinsically related to the performance of revenues. Meanwhile, the utility level of a professional soccer team (understood in the most extensive sense) also depends on a complex set of factors. One of these determinants is the evolving spatial context.

The “market area” around a sport institution, is not only conditioned by the demographic dimension. Additional dimensions are those connected to the revenue of people, their level of education and the possibility of consuming cultural and sportive goods because primary social needs are satisfied (for example, housing comfort).

The structure of this paper is followed with a Section 2, where the effort of reviewing the state-of-art is shown. The main topics that have been consulted are related to the relationship between economic development and sports.

Section 3 discusses the model of maximization of the utility of a sport collectivity considering spatial disparities. For this purpose, a model is built, in which the dependent variable assumes the value “1” if in a municipality exists the head office of a soccer team that plays in the major Portuguese league and “0” otherwise. The independent variables are indexes that measure the municipal development level: the Index of Comfort, the Index of Life Expectancy and the Index of Weighted Revenue. The logarithm of the number of residents in that municipality was used as a control variable.

Section 4 shows the results from the estimations using logit models. In a posterior stage, with data extended to the period between 1970 and 1999, those results were reviewed, especially considering the temporal dependence.

At last, Section 5 concludes.

2. Sports and Economic Development

The process of regional development contains a set of varied effects on the evolving socio-economic structure. These implications are specially perceived at the level of the individuals' lives and of their collectivities.

The sportive area is not immune to these effects. The economic sectors that are related to the most expensive sportive modalities are those which reflect this phenomenon in the clearest way. So, only if certain characteristics are present in the evolving region, some modalities can be developed and some ambitious sportive collectivities can reach the desired results.

Hoffman, Ging, Matheson and Ramasamy (2003) corroborate this relationship. These authors state that a higher level of development is associated with more modern sportive infrastructures that support the practice, with the existence of more significant financial incentives and, in another way, with the presence of more hours of leisure, which allows more considerable consumption of sportive goods. This observation follows Maslow (1970), as some basic needs are satisfied.

Coates and Humphrey (2003) identified certain socio-economic characteristics as being responsible for changing individuals' preferences for public investment actions that support the sportive activity. Some of these characteristics are the proportion of individuals who live in poverty, the proportion of urban residents and the proportion of high-qualified workers.

Other authors, like Gartner and Pommerehne (1978), Bird (1982) or Downward and Dawson (1999), strengthen the importance of the socio-economic context on the sportive promotion. These authors remind us that the education level or the persistence of sportive consumption habits are as important as the usual dimensions, like the average regional revenue.

Nevertheless, the relationship between the sportive improvement and the regional development level does not exclusively show the suggested sense of endogeneity of the first variable. Alternative contributions from Johnson, Groothuis and Whitehead (2001), signal that the presence of sportive teams in a specified geographic area promotes a set of externalities that fall upon the local revenue (by additional tourist flows) and upon other kinds of considered public goods (like the feelings of local unity and pride). Coates and Humphrey (2003) stress the importance of sportive equipments as main components of re-development and as sources of economic growth (through the generation of employment and wealth), specially in the adjacent regions where the sportive activity is practiced.

Within this perception on the generality of the sportive modalities, we easily perceive that sports requiring the most expensive structure of costs show this relationship in a more expressive way. A relevant example of these modalities is soccer (known as football in Europe).

Professional soccer teams have a structure of costs depending on the league in which they are playing. Strictly regional competitions are supported by the collectivities showing lower costs than those teams that play in more demanding championships (also usually in a larger geographical scale). Using the Portuguese case, teams that play in the leagues that are organized by regional associations (“Associações Distritais de Futebol”) reveal lower costs than a randomly chosen collectivity from the most important Portuguese competition (the nowadays called “Super Liga”). Without intending to be exhaustive, these costs standards are composed by expenditures associated with wages (managers, players, coaches, administrative assistants and other team workers), with the preservation

of the infrastructures, with traveling (mainly for effects of competition and representation of the collectivity) and with investment plans (for example, to enlarge the infrastructures or to activities that expand the supply of other services to members).

To support costs, soccer groups can be financed through many mechanisms. We can enumerate some of them as, box-office revenues, funds from the (central and local) Government, monthly fees paid by the members, rent of publicity space, sale of patrimony, revenues from merchandising practices and borrowing are the most relevant.

Dobson and Goddard (1996) found that there are two groups of reasons for box-office revenues. One of these groups is related to the sportive performance of the collectivity and the other is associated with the evolving socio-economic context. In the first group, some of the determinants are the team successes and the members' loyalty (in the sense that teams which win more times and with a relevant sportive history have a more voluminous support). In the second group, we can find variables like the local population, the number of neighbor teams that play in the same competition, the proportion of resident males and the proportion of resident employed males. In a wider observation, Downward and Dawson (1999) divide the factors responsible for changing the demand of games-tickets of a certain collectivity into two groups: the economic factors and the sportive factors. Some of the variables found in the economic factors are the market area of the sportive collectivity, the level of local revenue and the level of prices; as sportive factors, there are the uncertainty associated with the result, the quality of the matches, the atmospheric conditions and the possibility of television transmission.

According to these findings and because the revenue is an important factor of preference for watching a match, the demand of professional soccer games can be associated with the traditional offer-demand functions characterized by high income-elasticity. Simons (1996) corroborates this hypothesis and he additionally states that soccer is often a luxury good: its demand is substantially changed as a function of the individuals' revenues. Consequently, richer supporters (or richer areas) can offer more significant audiences and

more voluminous revenues. Thus, more ambitious professional teams can only get sufficient support if they are located in areas with high levels of development.

Other authors complement this idea. Berument, Imanlik and Yucel (2003) found a positive relationship between the growth of industrial production in a certain area and sportive victories of teams belonging to that same area. The growth of industrial production can be conceived as a phenomenon that improves the economic development. The improvement of the productivity is associated with the growth of the per capita revenue. This relationship allows an additional argument favoring the presence of ambitious professional soccer teams in the most industrialized regions.

According to Mourao (2004), if we observe the reality of a concrete country (Portugal), it is confirmed that the regions with a higher level of development are the coastal ones. Curiously, these are also the regions where the head offices of the teams that have been playing in the Portuguese premier league are located, since the oldest possible observation (1970) of the most-cited indexes of development.

3. The model of the behaviour of a sportive collectivity

In this section, a model is suggested to be used for testing the nuclear hypothesis: “The economic development level of a region influences the presence of professional soccer teams in the premier league of Portugal which have their head offices in that region”. This is a subsidiary model of the analysis on the industrial location. Consequently, a certain sportive association aims at maximizing its utility, subject to spatial conditions of the evolving region where the head office is located. According to Figueiredo and Guimaraes (2002), who discussed the components that influence the industrial location, the proposed model of a sportive group i whose head office is located in the region j can be synthesized by the following way (U_{ij}):

$$U_{ij} = \varpi_{ij} + \eta_i + \varepsilon_{ij} \quad (3.1)$$

In Equation (3.1), ϖ_{ij} represents the characteristics of each space that explain the change of resource costs of the sportive group, including access costs; η_i is associated to the set of strictly individual characteristics of each collectivity (like the diversity of management models or the number of members); and ε_{ij} is expressed as a random factor (like not observed elements, not systematic measurement errors, idiosyncratic preferences of the decision-makers of the groups, among other aspects not considered).

So, the collectivity i will develop the core of the activity in the space m whenever the condition (3.2) is verified.

$$U_{im} > U_{ij}, \forall j, j \neq m \quad (3.2)$$

The probability, which is associated with the choice of m (and with the refusal of j), mainly depends on the spatial characteristics (ϖ_{ij}) and on the random factors (ε_{ij}):

$$P_{im} = P(U_{im} > U_{ij}) = P(\varpi_{ij} + \eta_i + \varepsilon_{ij} > \varpi_{im} + \eta_i + \varepsilon_{im}) = P(\varpi_{ij} + \varepsilon_{ij} > \varpi_{im} + \varepsilon_{im}), \forall j, j \neq m \quad (3.3)$$

From (3.3), it results (3.4) such that:

$$P_{im} = P(\varepsilon_{ij} - \varepsilon_{im} < \varpi_{im} - \varpi_{ij}), \forall j, j \neq m \quad (3.4)$$

According to Griffiths, Hill and Judge (1993), if it is considered that $\varpi_{im} - \varpi_{ij}$ can assume the utility index I_m whose estimation is $x_i'\gamma$, following the classical assumptions of identical independent random errors with a null average and σ_j^2 as expected variances, then (3.4) is transformed in (3.5):

$$P_{im} = P(z_{im} \leq x_i'\beta) \quad (3.5)$$

where $z_{im} = \frac{\varepsilon_{ij} - \varepsilon_{im}}{\sqrt{\sigma_j^2 + \sigma_m^2}}$ and $\beta = \frac{\gamma}{\sqrt{\sigma_j^2 + \sigma_m^2}}$.

In the assumption that $\varepsilon_{ij} - \varepsilon_{im}$ has a logistic distribution, the cumulative distribution function is expressed as

$$F(I_i) = \frac{1}{1 + e^{-I_m}} \quad (3.6)$$

and the model is considered as a *logit* one.

In this study, the set of explicative variables of I_m is constituted by three indexes of economic development associated with each spatial unity and by the people dimension, here used as a variable of control. When intending to test the original hypothesis (“The economic development level of a region influences the presence of professional soccer teams, which have their head offices located in that region, in the premier league of Portugal”) it is relevant to consider variables, which can express the development level of a region as a whole. The relevance of alternative variables can be discussed observing the likelihood of the estimated model.

The complex thematic of the Economic Development allows the proposal of many possible dimensions and the multiplication of the proposed variables. However, referring to the usual dimensions of studies developed by international organizations (like the Program of the United Nations for the Development) or by some Portuguese studies (like those signed by Conim (2002) or Mourao (2004)), the observed dimensions and the suggested variables are the following:

- level of quality of life, proposed by the Index of Comfort; it is expected that regions (or municipalities) with higher values promote the presence of teams in the main Portuguese soccer league because basic needs (like the electricity

or the sanitation facilities) are satisfied, people can afford to support cultural or sportive Consumption;

- level of longevity, suggested by the Index of Life Expectancy (ILE); it is equally expected that high values of this variable incentive affect the probability of a certain region having a team there located in the most expensive competition in the sense that a qualitative and quantitative growth of the population raises the local demand of match-tickets;
- average level of local revenue, represented by the Index of Weighted Revenue (IWR); according to the consulted authors, we can expect that high values of this index increases the probability of a certain collectivity to participate in the main league, considering the possibility of financial supports;
- Population size, as a variable of control, that allows a perception of the potential market area (box-office revenues or members' contributions), according to Dobson and Goddard (1996) or Downward and Dawson (1999); it is expected that the associated coefficients return positive values.

4. Data and Results from the Estimations

4.1 Data and First Results

Now, we intend to analyze the conditions that explain why certain areas host the head office of a professional soccer team that plays in Portugal's first league. Consequently, the dependent variable (CAMP) takes the value "0" if a certain municipality in a given year has no head office of a team playing in the major league or "1" otherwise. The source of this variable was a publication of the editorial group A Bola (2004), which covers the various editions of the main professional league, in Portugal.

For the set of the explicative variables, we referred to the municipal indexes of economic development that have been obtained by Cónim (2002) and commented by Mourão (2004). Each index results from the following calculus, inspired by the components of the

Index of Human Development, which is yearly computed by the Program of the United Nations for the Development:

$$\text{Index X of the municipality A} = \frac{X_A - VMIN_X}{VMAX_X - VMIN_X}$$

Where X_A refers to the value of the X variable observed in the municipality A, $VMAX_X$ is related to the maximum value of the X variable considering all the municipalities and $VMIN_X$ takes the minimum value of X, also taking into consideration the complete set of municipalities.

Thus, as previously introduced, the studied dimensions and the revealing indexes are the following:

- level of quality of life, suggested by the Index of Comfort (IC), that analyzes the differentials in the proportion of the population that has access to potable water, basic sanitation facilities and electricity;
- level of longevity, suggested by the Index of Life Expectancy (ILE), which studies the municipal differences, using 85 years as expected life maximum value;
- and level of revenues proposed by the Index of Weighted Revenue (IWR), which observes the disparity of the logarithms that are associated to the per capita revenue of each municipality, now considering the established standard by the United Nations (maximum of 40000 dollars measured by the Purchase Power Parity, dppp, and minimum of 100 dppp).

For a wider proposal of the evolution of the cited indexes, Mourao (2004) offers an interesting alternative. As a synthesis, we can observe that, although there's a reduction of the disparities of each index from 1970 to 1999, the most significant values belong to a restricted group composed by the municipalities of the NUT III Great Lisbon, Great Oporto and Peninsula of Setubal. Otherwise, the lowest values are those of the municipalities which are combined in the NUT III Dao-Lafoes, Tamega, High Tras-os-

Montes and Central Alentejo. The reduction of the disparities has been more significantly registered in the Index of Comfort and in the Index of Life Expectancy.

Although Cónim (2002) only exhibits values from the introduced indexes for five stages (1970, 1981, 1991, 1995 and 1999), the values associated to all the years between 1970 and 1999 were interpolated, recurring to geometric series. Consequently, a panel of 306 Portuguese municipalities was constituted and observed between 1970 and 1999. Instead of their components, the preference for various indexes is strongly justified: first, it allows to broach joint dimensions instead of particularized features; second, it avoids the problem of having redundant variables in the model, because they are compressed into variables (the mentioned Indexes) that are wider, non-redundant and with no loss of information; and third, the process of development being a multifaceted one, it would be extremely reduced to consider isolated dimensions proposed by a single index.

According to Dobson and Goddard (1996) or Downward and Dawson (1999), a control variable was inserted – the logarithm of the resident population in each municipality (LPOP). The source of this variable was the National Institute of Statistics (INE) and the values were taken for the observed sample (1970-1999) and for all the municipalities. These data confirm the conclusions of a publication from the INE (2002): the NUT III Great Lisbon, Great Oporto, Peninsula of Setubal and Cavado municipalities have a significant population presence, a trend nowadays strengthened following the observed distribution in 1970.

Table 4.1 presents the descriptive statistics of the suggested variables.

Table 4.1 – Descriptive Statistics (Portugal, 1970-1999)

	Variable	IEL	IC	IWR	LPOP	CAMP
Total	Number of observations	9149	9149	9149	9149	9149

	Mean	0,778	0,745	0,816	9,783	0,043
	Standard Deviation	0,062	0,211	0,042	1,016	0,202
	Minimum	0,383	0,049	0,652	5,829	0
	Maximum	0,883	0,999	0,967	13,828	1
If camp="0"	Number of observations	8759	8759	8759	8759	8759
	Mean	0,777	0,738	0,814	9,703	0
	Standard Deviation	0,062	0,212	0,042	0,944	0
	Minimum	0,383	0,049	0,652	5,829	0
	Maximum	0,883	0,999	0,947	12,752	0
If camp="1"	Number of observations	390	390	390	390	390
	Mean	0,794	0,899	0,862	11,599	1
	Standard Deviation	0,047	0,089	0,034	0,876	0
	Minimum	0,570	0,499	0,754	9,013	1
	Maximum	0,867	0,988	0,967	13,828	1

In table 4.2, the returned estimations appear for four separate years only: 1970, 1981, 1991 and 1999. Besides these are the years that Cónim (2002) specifically refers to. They are also the initial periods of the decades, enabling a very simple (and somewhat basic) perception on the projected effects for each variable. The chosen method for the estimation was the logit method. By this way, 306 municipalities were observed in each of these four years.

From these preliminary results, it is reported that the Index of Life Expectancy (ILE) and the Index of Comfort (IC) are not significant in any period. The estimations of the ILE

have a negative signal, which contradict the initial proposals. A possible explanation is related to the fact that municipalities with a higher IEL tend to reflect a lower preference on supporting sportive groups that play in the major League – if this is true, then we are reporting a relation of substitutability between sportive services and the services that are related to the promotion of demographic longevity.

The index related to the local revenues presents estimations of high and positive magnitude, in 1970, losing magnitude in 1981 and, curiously, exhibiting negative and non-significant values in 1991 and 1999. An explanation for this movement is the decreasing influence of the disparities in the local wealth level, per se, for elucidating the presence of a team in the major competition, which has the head office located there. In recent years, this hypothesis enables the possibility of cumulative factors to point out better determinants of the dependent variable in the most recent years. However, this observation does not deny that the municipal revenues had increased the probability of a certain team (located in that region) playing in the main professional league.

The population control variable (LPOP) shows statistical significance in these four years, with positive signals, as expected. This fact strengthens the proposal that the local demographic dimension (as potential supply of supporters) is an extremely relevant factor for explaining the dependent variable. This result is in compliance with those found by Dobson and Goddard (1996) and Downward and Dawson (1999). As an interpretative resource for logit regressions, it is suggested that the estimated coefficient for the logarithm of the population, for the year of 1999, proposes that the unit growth of this variable multiplies by a factor of 5.6 ($e^{1.723}$) the probability of a municipality having the head office of a Portuguese team that plays in the major league.

Table 4.2– Estimations of the logit model (dependent variable = 1, if the municipality in the reported year hosted the head office of a Portuguese team that played in the main league)

Years	1970	1981	1991	1999
ILE	6,025	-13,525	-29,350*	-26,451

	(8,069)	(13,836)	(15,448)	(18,347)
IC	3,888 (3,720)	3,831 (5,427)	6,097 (11,076)	16,388 (16,512)
IWR	64,212*** (22,106)	39,118** (16,272)	-23,228 (16,193)	-0,036 (14,652)
LPOP	2,010** (0,848)	1,502*** (0,551)	2,853*** (0,719)	1,723*** (0,469)
C	-83,690*** (25,477)	-43,867*** (15,554)	4,065 (11,919)	-14,610 (18,070)
N.Obs.	306	306	306	306
LR CHI2 (4)	67,14	50,09	54,50	44,11
Prob>CHI2	0,000	0,000	0,000	0,000
Pseudo R2	0,709	0,466	0,480	0,389

Note: Standard errors are between parentheses. Significance level: *, 10%; **, 5%; ***, 1%

4.2 Results from the estimations with the correction of the temporal dependence

Meanwhile, if the thirty years between 1970 and 1999 are observed for the 306 municipalities, then we can expand the sample to 9180 potential observations. For this set, the convenient procedure should be the one that is devoted to time series cross section data. The used methodology for estimating (4.1) followed the proposal of Beck, Katz and Tucker (1998).

Therefore, a model of time-series-cross-section data with a Binary dependent variable (BTSCS) is suggested by

$$P(y_{i,t} = 1) = f(x_{i,t}, y_{i,1}, \dots, y_{i,t-1}, x_{i,1}, \dots, x_{i,t-1}), i = 1, \dots, N, t = 1, \dots, T \quad (4.1)$$

where f is a function that attributes values between 0 and 1. Now, the explained variable takes the value “1” whenever the municipality i has at least one soccer team playing in

the major league with the head office there in year t^l . The previous equation can be simplified to (4.2) as derived from (3.6).

$$P(y_{i,t} = 1 | x_{i,t}) = \frac{1}{1 + e^{-x_{i,t}\beta}} \quad (4.2)$$

Facing the eventuality of temporal dependence, Beck, Katz and Tucker (1998) demonstrated that BTSCS data can be treated as grouped duration data, with the corresponding discrete hazard rate (4.3). This problem is present in the data used in this work – for example, the evolution of the indexes and of the population dimension and the own dependent variable.

$$P(y_{i,t} = 1 | x_{i,t}) = h(t | x_{i,t}) = 1 - \exp(-e^{x_{i,t}\beta + \kappa_{t-t_0}}) \quad (4.3)$$

In (4.3) x_{it} are representing the observed values of the independent variables for a given year and κ_{t-t_0} is an indicative variable of the length of zeros (absence of observation of the analyzed event). As suggested by Soysa and Neumayer (2004), Oneal and Russett (2003) had demonstrated that the insertion of this dummy variable is a good practice to correct any problem of endogenous kind in the data.

The link function logit changes the probabilities by (4.4).

$$\text{logit}(P) = \log\left(\frac{p}{1-p}\right) \quad (4.4)$$

This function will allow the conversion of (4.3) into the logistic form:

¹ It was considered that the team played in the main league in the year t whenever it was part of the major national championship that was begun at the end of August or at the beginning of September of the year $t-1$.

$$P(y_{i,t} = 1 | x_{i,t}) = h(t | x_{i,t}) = \frac{1}{1 + e^{-(x_{i,t}\beta + \kappa_{t-t_0})}} \quad (4.5)$$

Now, using the procedure related to BTSCS data and according to Beck, Katz and Tucker (1998), the results from a simple logit (without additional proceedings due to the possibility of temporal dependence) are found in the first column of the Table 4.3. This procedure reveals more advantages than the yearly estimation (Table 4.2): it oversees the circumstances of each period; observing the panel with various consecutive moments, the structure that supports it can be more accurately inferred; and finally there are considerable gains on the quality of the estimations, gains that can be achieved by the likelihood ratio or by Wald tests. The program BTSCS developed by Beck, Katz and Tucker (1998) was run in STATA 8.0 and it recurred to 9149 observations.

The derived results show significant coefficients for all the variables. The existence of a negative coefficient associated to the ILE is again reported, although the remaining indexes (IC and IWR) reveal coefficients that are in accordance with the expected signal. However, it is highlighted that the magnitude of the coefficient associated to Revenues has the highest value of all positive coefficients. As would be expected, the variable identifying the population is characterized by a positive and significant coefficient. The estimation of the interception is related to a negative value, revealing very low probabilities that a certain municipality with no significant values of the independent variables can host a team that plays in the major league.

In Table 4.3, columns II and III show the estimations of the models, now using procedures for controlling the temporal dependence in the data. In column II, the set of variables incorporates the dummies identifying κ_{t-t_0} , which indicate the length of periods in which a region had no head office of a team playing in the major League. In column III, the complimentary regression loglog link function (cloglog) is used, whose results shall present similar values to those of column II.

The obtained estimation returns the loss of statistical significance of the coefficient associated to IEL, and the indefinición of its signal. The estimations related to the IC

became more significant, highlighting the population's relationship with comfort (satisfaction of basic needs, in a general way), which releases resources to other needs' satisfaction, like the cultural or sportive ones. Although the related coefficient remains the highest positive in both columns (II and III), the IWR reveals a break in the magnitude in the cloglog regression.

The population variable is still significant but the estimated coefficient is reduced by a factor valued between 0,40 and 0,53. Again, it is proposed that the unit increase of this variable (LPOP) multiplies by 2.2 ($e^{0.789}$) the probability of the dependent variable taking the value of "1" in the regression of column II of Table 4.3.

Again, the interception returns with negative and significant values.

Table 4.3– Estimations of the models (dependent variable = 1, if the municipality in a year hosted the head office of a Portuguese team that played in the main league)

	COLUMN I	COLUMN II	COLUMN III
	Logit 1970-1999	Logit (C/dummies) 1970-1999	Cloglog 1970-1999
ILE	-8,775*** (1,544)	0,712 (2,003)	-0,163 (1,432)
IC	1,502** (0,755)	4,398*** (0,919)	3,936*** (0,749)
IWR	18,742*** (2,341)	15,262*** (3,164)	9,322*** (2,201)
LPOP	1,475*** (0,079)	0,789*** (0,114)	0,597*** (0,090)
C	-28,756*** (1,601)	-31,593*** (2,514)	-23,150*** (1,867)
N.Obs.	9149	7230	7230

LR CHI2 (4)	1289,92	1958,01	1949,46
Prob>CHI2	0,000	0,000	0,000
Pseudo R2	0,400	0,659	...

Note: Standard errors are between parentheses. Significance level: *, 10%; **, 5%; ***, 1%

Summarizing, the results confirm the importance of the demographic dimension and the relevance of high per capita revenues and good comfort levels achieved by the population, thereby elevating the probability that a municipality hosts the head office of a team that plays in the major competition. The other dimension – life expectancy – does not return a relevant influence in the regressions in which the problem of temporal dependence was corrected.

This observation corroborates the hypothesis for testing: “The economic development level of a region influences the presence of professional soccer teams in the prime league of their country, which have their head offices located in that region, ”. However, we must recognize that the most important dimension of the economic development that is attended by the teams of the major soccer league of Portugal is questioned with the revenues’ location in its evolving region (revenues that can be pointed as potential revenue sources to face more expensive competition structures). Close results (in British reality) were found by Dobson and Goddard (1996) and by Downward and Dawson (1999). A report from the National Institute of Statistics, INE (2005), entitled “Study on the municipal purchase power”, strengthens the significant correlation between demographic agglomeration and considerable regional per capita revenue.

Beyond these findings, we can consider an additional challenge in order to follow Johnson, Grootuis and Whitehead (2001) or Coates and Humphreys (2003). These authors suggest the existence of (social and economic) externalities in the regions that have teams playing in the major competitions. According to this hypothesis, we could follow Islam (1995), for example, and we could develop a regression whose dependent variable would be the growth of the Index of Weighted Revenue and the independent

variables would be the logarithm of the local revenue and the dummy variable signaling the presence of major league teams.

5. CONCLUSION

The aim of this study was to focus on the importance of the level of development of a certain area to the presence of teams, there located, in the highest level of sportive competitions.

The set of consulted authors unites the relevance of the various dimensions associated to the process of economic development (like production growth, the rise of revenues, the increasing level of urbanization or the level of scholarship) with the presence of more significant consumptions of sportive services. Thus, the nuclear hypothesis of this work was that the level of development can be an important factor on explaining the preference of the most ambitious soccer teams to have their head offices and their main volume of the activities in certain areas.

To test the hypothesis, a model was developed in which the primary proposition is derived from the industrial location. This model starts from the assumption of a decision-maker (the sportive group) that aims on maximizing the utility relating to spatial conditions.

Focusing on Portugal's reality of the main professional soccer league, the dependent variable (a binary one) took the value of "1" whenever a given municipality in a reported year between 1970 and 1999 hosted a team that was participating in that championship. To reflect the various dimensions of the economic development, the data were obtained from three indexes: the index of comfort, the index of life expectancy and the index of Weighted revenues. The advantage of working with indexes comes from the possibility of aggregating the information, avoiding the loss of degrees of freedom. Another advantage is the resulting perspective of a whole, so necessary for any process of

economic development. Additionally, the logarithm of the resident population was used as a variable of control.

Through logit models and with the correction of the temporal dependence associated with binary time-series cross-section data, it was concluded that local comfort dimensions, local revenues and the population size are the most significant factors for increasing the probability of a certain municipality to host soccer teams that play in the Portuguese main league. Consequently, these results confirm the central hypothesis of this work, being in compliance with those obtained by alternative authors like Dobson and Goddard (1996) or Downward and Dawson (1999).

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