Munich Personal RePEc Archive

The Taylor Effect on the Performances of the Red Devils' Football Brand

João Leitão
University of Beira Interior

15. May 2007

Online at *http://mpra.ub.uni-muenchen.de/3244/*
MPRA Paper No. 3244, posted 15. May 2007 / 12:28

THE TAYLOR EFFECT ON THE PERFORMANCES OF THE RED DEVILS' FOOTBALL BRAND

The Taylor Effect on the Performances of the Red Devils' Football Brand

João Leitão

University of Beira Interior, Covilhã, Portugal

Abstract

In this paper we present an impact analysis of the regulation associated to the adoption of the Taylor Report, both on business strategy and sportive and financial performances of the Manchester United Football Club. An econometric approach is presented, by using a Cointegrated Vector Autoregressive (CVAR) model. This aims to analyse the impact of the regulation in terms of the national sportive performance, the value added, and the sales of the club, from 1967 to 1997. The importance of the Taylor Report on better national sportive performances of the football club in study is ratified. The growing importance of generating value added as a precedent mechanism that explains the best national sportive performance is confirmed.

Key-Words: Cointegration, Football Club Brand, Regulation.

The Taylor Effect on the Performances of the Red Devils' Football Brand

Introduction

Football is an extremely important social, political and financial phenomenon. In fact, the occurrence of disasters involving fans, the direct or indirect participation of the media in the football industry, and the integration of investors into the professionalized business administration of football clubs contribute to the need for implementing regulation actions. This kind of actions constitutes an adequate answer for the new challenges that are currently faced by the football clubs that are oriented to success, all over the world.

The literature until now was focused on the study of the determinant organisational factors of the success of leading international football clubs, such as, the Manchester United Football Club (MU) and the Real Madrid Football Club. This article is an innovative contribution since it presents an impact analysis of an exogenous regulation action on two levels of the football clubs' performance: sportive and financial. Furthermore, it reveals the importance of generating value added through the sales that are associated to the football club brand, as a key process for reaching upper sportive performances. In this sense, this contribution assumes a special importance, since a dynamic analysis is performed that reveals the importance of the external determinants that are related to the regulation actions, which may be public policies oriented to the creation of value added and sustainable corporate strategies, from the part of football clubs.

The present paper aims to evaluate the impact of the regulation actions associated to the adoption of the Taylor Report both on business strategy and sportive and financial performances of the most valuable English football club brand in the world, that is, the MU.

The paper is structured as follows. First, the business strategy of MU is presented, by taking into consideration the regulatory framework and the strategic guidelines implemented by the managers of the club. Second, a review about empirical evidence is made. Third, the econometric methodology that uses a Cointegrated Vector Autoregressive (CVAR) model is presented. The estimation procedures are: (i) the selection of an initial model specification, (ii) the study of the integration order of the variables, (iii) the detection of the cointegration relations, (iv) the accomplishment of Granger causality tests, and (v) the estimation process of the CVAR model. Last, the concluding remarks and future researches are presented.

The Business Strategy of MU

The analysis of the guidelines of the business strategy of the MU aims to better understand its differentiated strategic conduct, during its recent sportive story. We aim to contribute for better understanding the impact of the regulatory determinant in study, that is, the Taylor Report, on the design of the MU's business. Furthermore, the impact on financial and sportive performance of the most valuable English football club brand in the world is also analysed.[1]

Regulatory Determinant: The Taylor Report

In the present paper, a special importance is given to the regulation that was implemented by public and sportive entities, in the sequence of the disaster that took place on 15th April 1989, at the Sheffield Wednesday's Hillsborough football ground, during a semi-final of the FA Challenge Cup. Following the disaster, Lord Justice Taylor was appointed to conduct an inquiry into the disaster. As a result of the inquiry, fences in front of fans were removed and stadiums were converted to become all-seated. This became known as the Taylor Report. This document sought to establish the causes of the disaster, and also make recommendations regarding the provision of safety at sporting events.

In this sense, it was regulated that all major stadiums should be converted to an all-seater model (i.e., all ticketed spectators have seats, as opposed to some or all being obliged to stand). The Football League in England introduced regulations intimating that clubs in the highest divisions must comply with the referred recommendation, and some clubs started upgrading their stadium even before this rule was published, in January of 1990, as it happened in the case of MU. Other smaller recommendations were made on such items including alcohol within stadiums, crush barriers, fences, turnstiles, cost of a ticket and other stadium items.

Strategic Guidelines

The adoption of the directives presented in the mentioned Report has created a great pressure over the English football clubs since these directives have promoted broad changes at the level of both the business administration models and the business strategy implemented by clubs. In this context, it must also be stressed

[1] For an extended report about the most valuable European Football Club Brands, consult Brand Finance (2006).

the creation of the FA Premier League, in 1992. That happened at the same time as MU began its internal change process, in terms of the model of business administration.

The conjunction of these important facts has promoted broad changes not only in the model of business administration of MU, but also in the models that were developed by the generality of the English football clubs since then. Moreover, the larger control of the broadcasting rights by the English football clubs had a decisive role in reaching alternative sources of revenue as it reinforced its bargaining power.

According to Szymanski (1998), Szymanski and Kuypers (1999), and Callejo and Forcadell (2006) the reputation as a differentiating factor of MU was built along its rich sportive history. This reputation is expressed in operational terms through the capacity of attracting sources of revenue that are stronger than the one that is reached by other rival football clubs.

Szymanski (1998:52) states that “MU is well supported because it has always been well supported”. The strong brand name of MU provides the possibility to the fans for considering the choice of supporting the club over a lifetime. This way the commercial exploration of the MU’s brand image increases the sales’ revenues and the value added of the club, in a sustainable basis.

Under a different approach of the one that was, originally, presented by Szymanski (1998:54), which stated that the “MU’s success is contingent, driven by good and bad fortune, and hardly the outcome of a conscious strategic plan”, we identify the strategic guidelines of the corporate strategy designed by the MU’s managers, starting from the first half of the 1990’s.

The model of business administration of the MU may be described through four strategic guidelines: (i) the recruiting of Young Best Players (YBP), (ii) the exploration of the sales associated with the MU football club brand, (iii) the adoption of a concept of multiple uses Arena, for different uses of the stadium, and (iv) the creation of a solid Sponsoring Group.

The strategic conduct of the MU is characterised by the balance of interests of the totality of the stakeholders that belongs to the external environment, such as the shareholders, fans, media, sponsors and professional players.

The first strategic guideline has incorporated the expected results by the stakeholders. Thus, an internal politics of recruiting young players of the national football teams was adopted in order to attain the aims of the shareholders (just as it happened in the cases of the English players David Beckham and Wayne Rooney, and more recently, of the Portuguese player Cristiano Ronaldo). This aims both to provide a larger stability to the team and to facilitate the identification of young supporters to the football club brand and the mystic of the club.

The second strategic guideline aims to improve the world recognition and valuation of the football club brand. This contributes to the reinforcement of the commercial power of the sales of several merchandising goods with the MU's brand. In the season of 1991/1992, when most of the clubs failed in the accomplishment of the great potential of its brands, the managers of MU have transformed the merchandising in a very successful operation. This success was based on the change both of the organisational culture and of the global business strategy of the club. This way, the supporters of the club began to be treated as great consumers of goods and services associated with the football club brand: MU.

The third strategic guideline that is related to the adoption of the new concept of multiple uses Arena provides the possibility of generating alternative revenues during the civil year (and not just during the periods of the different sportive competitions). This arena includes a diversified offering set of services, namely the Red Cafe (open daily), the Mega Store (where several goods with the MU football club brand may be acquired), the musical concerts, the conferences, the exhibitions, the guided visits to the Museum of the club, or even the celebration of marriage ceremonies.

The fourth strategic guideline concerns the creation of a solid sponsoring group in order to promote a strong relationship with the fans of the club, especially the youngest ones. This relationship aims to promote the recognition of the international brands involved in the sponsoring group, in association with the football club brand that is already highly valued by the fans. In operational terms, the revealed preferences of the young fans are explored by providing a psychological association among the consumption of certain brands, the football club brand of the winners and the club orientation to the success.

Empirical Evidence

According to Araujo *et al.* (2003), in the literature about the Economics of Football three basic research lines may be identified: (i) the use of the football data to test economic theories; (ii) the analysis of the economic specificities of the football industry; and (iii) the application of the economic theories and of the statistic and forecasting methods to the football activities.

The present paper integrates the third research line. Thus a brief revision of the empirical evidence in the framework of the Economics of Football is made in order to identify the framework of the present study.

Dobson and Goddard (1996) developed a time series approach by making use of a dynamic error correction model, in order to identify the economic and football-specific determinants of the football demand in the regions of England and Wales. Their approach provided estimators both for the short and the long run. In terms of main results, in spite of the strong regional dimension related to the relationship between attendance share and performance, the authors found weak evidence of regional variation in the coefficients of the attendance model.

Szymanski (1998) presents two basic insights in his pioneer study about MU. First, better league performance leads to higher revenue. Second, increased wage expenditure leads to better league performance. On the one hand, improving club performance implies increasing revenues that are based on higher ticket prices, levels of sponsorship, merchandising and TV income. On the other hand, increasing wage bills of the football clubs imply to recruit better players, which, for its turn, are expected to win more matches and to improve sportive performance.

Dobson and Godard (1998), by performing Granger causality tests, revealed that high levels of past revenue lead to present on-field success, whereas past performance had only a limited effect on current revenue.

Dobson and Godard (2001) developed also multivariate estimations applied to case studies of English football clubs. The results provided some comparative analysis in relation to other important clubs in Europe, Japan, and North America. Among the distinct economic relationships that were studied, it should be enhanced the importance of the managers on the sportive performance of the clubs, the influence of the football players'

wages on the sportive performance of the football clubs, and also the importance of the stadiums attendance in attaining upper sportive and financial performances.

The results revealed that the Brazilian clubs present an effective necessity of delineating an appropriate competitive positioning in strategic terms. That positioning requires the acquisition of competences at the level of the business administration models, and the external and internal information systems as the clubs obtain the expected results, as much in sportive terms as in financial terms.

Ramos (2002) used the theoretical foundations of the business strategy to explain the reasons for the success or the failure of English and Portuguese football clubs, both in sportive and financial terms. The author detected a strong correlation between the sportive success and the wages. Furthermore, a strong correlation was also detected in what concerns the relation between the capacity to generate revenues and the sportive performance.

Araujo *et al.* (2003) developed an econometric study about the sportive performance of the Brazilian teams of football, in the period from 1971 to 1998. Taking as reference the quality of the clubs' players, the existence of a positive relationship between the top of the league table and the degree of efficiency obtained by the football clubs was ratified. Additionally, it was observed that the richest cities present a larger probability of having a local football club reaching the top in the league table.

Haas *et al.* (2004) analysed data of the German Championship of Football in the season of 1999/2000 in order to identify the level of efficiency of each team that participated in the championship, through the use of Data Envelopment Analysis (DEA). The authors used the wages of the managers and of the players as input variables, whereas the output variables were the points that were obtained by each football team, the average attendance in the stadiums, and the total revenues obtained by each club. The results revealed the inexistence of correlation between the level of efficiency and the position of the club in the ranking of the German Championship of Football.

Shikida and Shikida (2004) also developed an econometric study applied to the Brazilian football championship, in the period from 1971 to 2003, where the effect of the increases of income taxes on the decisions of the supporters to attend the stadium was analysed. The authors considered other explanatory variables, such as: the inflation, the appearance of cable television, and the number of working days, per person.

The results revealed that the Brazilian people go to a football stadium as an alternative form of opium. They aim to overcome the frustration induced by the increasing application of additional income taxes.

Callejo and Forcadell (2006) analysed the determinants of the success of another leading international football club, that is, the Real Madrid Football Club. The authors present the football club as a brand, which provides the commercial exploitation of the sponsorship plan and merchandising, together with the sale of audio-visual and television rights of sporting events. This management model aims to reach two levels of success: sportive and economic. The brand image is originated from the club resources: past and current players, corporate culture, and the tradition of success that was developed during its rich history.

This provides the design of a brand strategy that is fundamentally edified on resources based view, but this presents an incomplete nature that may be completed through the analysis of the differentiated impacts of regulation or other exogenous socio-economic variables, on the levels of sportive and financial performances of football clubs that are oriented to success.

Econometric Methodology

The present study aims to determine the impact of the Taylor Report on the sportive and financial performances, taking as reference the case of the MU, that is, the most internationally recognisable and valuable English football club brand. This represents an innovative approach since the literature until now was focused on efficiency and corporate strategy analyses of leading international football clubs.

In order to provide a dynamic analysis, and taking into consideration the relationships provided by the economic theory and empirical evidence, a cointegrated vector autoregressive model is used. This kind of econometric methodology provides, on the one hand, the possibility to accomplish longitudinal case studies and, on the other hand, the development of a dynamic analysis. This makes it possible to identify the cointegration relations and the causality relationships that are established among the variables. Additionally, it provides the identification of different types of impacts that are originated by the variables considered in the selected model specification (Juselius, 2007).

The database used in the present approach is the one that was originally developed by Szymanski and Kuypers (1999), and it embraces a set of economic and sportive variables, in the period from 1967 to 1997.

The econometric methodology follows an outline of five sequential steps that are based on the estimation procedures of the CVAR model: (i) the selection of an initial model specification; (ii) the study of the integration order of the variables; (iii) the detection of the cointegration relations; (iv) the accomplishment of Granger causality tests; and (v) the estimation process of the CVAR model.

In the initial specification of the model, we will take into consideration the relationships established in economic theory about sportive and financial performance of football clubs. In what concerns the study of the integration order of the variables, two tests are used: the ADF test (Dickey and Fuller, 1979); and the Phillips-Perron test (Phillips and Perron, 1988).

The use of two types of tests can be useful since the null hypothesis of the ADF test may not be rejected, even in the presence of a structural break in the generation process of the data. Besides, as it is pointed out by Perron (1989), the use of only one conventional test for detecting unit roots in a subset of data, may generate losses, in terms of the test power. These losses may conduct in an erroneous way, to the rejection of the null hypothesis.

The number of lags to be considered in the case of the ADF test is selected according to the results provided by three information criteria: Akaike, Hannan-Quinn and Schwarz. The maximum number of lags is selected through the use of the decision rule provided by the Bierens criteria. For performing the Phillips-Perron, an estimator of the long term variance of the Newey-West type is used, in order to correct the heterocedasticity and autocorrelation of the data.

In relation to the cointegration vectors, these are calculated for the whole period of the sample. In order to detect the existence of cointegration relationships, the Maximum Eigen value tests, and the trace test, are used (Johansen, 1988, 1991, 1994; Johansen and Juselius, 1990). The lag of the variables is selected taking into consideration two information criteria: Hannan-Quinn and Schwarz. In the estimation process, we use the largest lag proposed, starting from a maximum lag of eight periods.

The use of Granger causality tests provides the possibility to test the existence of precedence relationships among the variables that represent the sportive and financial performance of MU and also the regulation action in study, that is, the Taylor Report. The number of lags to be considered in the estimation procedure is selected according to the use of three information criteria: Akaike; Hannan-Quinn; and Schwarz. In order to eliminate spurious estimations, we select the largest lag, starting from a maximum lag of eight periods. Furthermore, the statistical significance of the estimators is tested through the inclusion of further lags.

The estimation process of the CVAR model provides the possibility of making use of two forecasting techniques, such as, the impulse response functions and the variance decomposition of the forecasting error of Cholesky. The former provides us the measurement of the statistical significance, the magnitude, and the persistence of the impact of an innovation that occurred in another variable, through the analysis of the coefficients of the impulse response functions. The later makes possible the identification of the proportions associated to each variable on the system, through the analysis of the variance decomposition of the forecasting error, that allow identifying the exogeneity degree presented by each one of the variables in study.

Model Specification

The measures of performance that were used by Dobson and Godard (1996, 2001), and Szymanski (1998, 2001) are also considered in the model specification. In this sense, the vector autoregressive (VAR) model applied to the case of the MU presents as differentiating elements the use of both a variable of national sportive performance related to the position reached in the Premier League, and a variable of financial performance, which is measured through the value added of the club.[2] Besides that, a variable regarding the sales associated to the football club brand and a dummy variable related to the implications of the adoption of the Taylor Report are also included in the model specification.

The initial model specification is represented through a system of four equations with four endogenous variables:

[2] The value added of the club is obtained through the following expression: Value Added (VA_i) = Sales (SL_i) - Salaries (SA_i) + Transferences (T_i).

$$\begin{bmatrix} LNPOS_t \\ LNVA_t \\ LNSL_t \\ TR_t \end{bmatrix} = \begin{bmatrix} \alpha_{1t} \\ \alpha_{2t} \\ \alpha_{3t} \\ \alpha_{4t} \end{bmatrix} + \begin{bmatrix} \beta_{1,1} & \sigma_{1,2} & \theta_{1,3} & \Omega_{1,4} \\ \beta_{2,1} & \sigma_{2,2} & \theta_{2,3} & \Omega_{2,4} \\ \beta_{3,1} & \sigma_{3,2} & \theta_{3,3} & \Omega_{3,4} \\ \beta_{4,1} & \sigma_{4,2} & \theta_{4,3} & \Omega_{4,4} \end{bmatrix} \times \begin{bmatrix} LNPOS_{t-p} \\ LNVA_{t-p} \\ LNSL_{t-p} \\ TR_{t-p} \end{bmatrix} + \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \\ u_{4t} \end{bmatrix} \quad (1)$$

Where: the $LNPOS_t$, $LNVA_t$, and $LNSL_t$ are the natural logarithms of the variables that represent the sportive and the financial performances of the MU, and TR_t is the dummy variable that is a simplified representation of the Taylor Report (TR). This variable assumes a value equal to zero, for the previous period to the regulation action, that is, from 1967 to 1988. Whereas, starting from the period of adoption of the Taylor Report, it assumes a value equal to one, that is, from 1989 to 1997. The number of lags is given by: $p = 1,...,k$, where *k* corresponds to the optimal number of lags $(p_{\max})$; *t* corresponds to the year; and u_{it} are the errors or the random disturbances.

Integration Order

The first step in the determination of the kind of relationship that is established among the variables in study is the application of the unit root tests that lead to the detection of the integration order of the economic variables. The procedures that are widely used to detect the existence of a unit root make use both of the Augmented Dickey-Fuller Augmented (ADF) Test and of the Philips Perron (PP) Test.

In what concerns to the ADF test, this can be expressed by the following condition:

$$\Delta \boldsymbol{X}_t = \alpha + \gamma t + \lambda^* \boldsymbol{X}_{t-1} + \delta_1 \Delta \boldsymbol{X}_{t-1} + \delta_2 \Delta \boldsymbol{X}_{t-2} + ... + \delta_{p-1} \Delta \boldsymbol{X}_{t-p+1} + \boldsymbol{\mu}_t \quad (2)$$

The previous expression corresponds to a parametric correction. It consists of adding lagged terms of the variable ΔX_t in order to correct the correlation of upper order. The application of the $ADF(\gamma)$ test consists of testing the null hypothesis $H_0 : \gamma = 0$, against the alternative hypothesis $H_1 : \gamma < 0$. When γ is non-significant, the null hypothesis cannot be rejected. From this we conclude that the series is non-stationary (that is, the series is integrated), or that it presents a unit root (Dickey and Fuller, 1979).

An alternative approach to the problem of the autocorrelation in μ_t is the one proposed by Philips and Perron (1988). This approach is a non-parametric one, and it follows the following autoregressive process:

$$\Delta \boldsymbol{X}_t = \alpha + \gamma t + \lambda^* \boldsymbol{X}_{t-1} + \boldsymbol{\mu}_t \quad (3)$$

The asymptotic distribution of the estimators of the regression, as well as their *t* ratios, depend on the parameters σ^2 and σ_u^2. In practice σ^2 and σ_u^2 are not known, and so it is necessary to proceed with their estimation, in a consistent way[3].

[3] For a consentaneous example of the estimation process, see Newey and West (1987).

Variables	First Differences	
	ADF	PP
LNVA	-6,037*	-10,984*
LNSL	-5,415*	-6,943*

* It denotes the rejection of the null hypothesis that is related to the existence of a unit root.

Table 1 – The ADF tests, and the PP tests, including constant and tendency

Variable	First Differences	
	ADF	PP
LNPOS	-7,075*	-9,646*

* It denotes the rejection of the null hypothesis that is related to the existence of a unit root.

Table 2 – The ADF tests, and the PP tests, without constant and without tendency

According to Khalid and Kawai (2003), the appreciation of the results obtained through the application of both the ADF test and the PP test, which include the constant and the tendency, is enough to detect the existence of unit roots in the time series in study. Since the variable related to the final position reached by the MU in the Premier League has a special nature, the ADF tests and the PP tests were performed without including both the constant and the tendency. After once having differentiated the time series, the null hypothesis is rejected, that is, the series are stationary and they are integrated of order one, or *I(1).*

Estimation of the VAR Model

In the selection of the optimal number of lags (p_{max}) to be considered in the estimation process, the values of five different information criteria are computed. After detecting the inexistence of error autocorrelation, through the use of Lagrange Multiplier (LM) Tests, with one lag and two lags respectively, and considering only the more penalising results obtained through the use of the Schwarz Bayesian Criteria (SBC), we retain that, in the estimation process of the VAR model, only one lag should be considered[4].

Lags	LogL	LR	FPE	AIC	SBC	HQ
0	-90.7017	-	0.0080	6.5311	6.7197	6.5902
1	-35.7226	90.9998*	0.0005*	3.8429*	4.7859*	4.1382*
2	-23.8541	16.3703	0.0007	4.1278	5.8252	4.6594

It identifies the optimal number of lags selected through each one of the information criteria.
Where: LR is the Likelihood Ratio; FPE is the Final Prediction Error; AIC is the Akaike Information Criteria; SBC is the Schwarz Bayesian Criteria; and HQ is the Hannan and Quinn Criteria.

Table 3 – Selection of the optimal number of lags

In what concerns the process of detecting error autocorrelation, we present the results obtained through the use of LM Tests, with one and two lags[5] respectively. Furthermore, the probabilities of the *Q* statistics (*PQ(12)*)[6] and the correspondent adjusted value (*PQ(12) Adj.*) are also computed.

Lags	AIC	SBC	PQ(12)	PQ(12) Adj.	LM Tests
1	4.456725	5.776873*	0,8997	0,1487	LM1= 0,3831 LM2= 0,1520
2	4.412703	6.506168	0.7191	0.0194	LM1= 0,5036 LM2= 0,1716

* It identifies the number of lags which provides the minimisation of the value assumed by the SBC.

Table 4 – Detection of error autocorrelation

[4] For an expanded discussion about the use of different information criteria, consult Lütkepohl (1999, 2004).
[5] Since the sample is constituted by annual observations.
[6] In the present case, the number of observations is reduced, so it isn't adequate to use a greater number of lags. For this we consider only the probability of 12 autocorrelation coefficients being equal to zero (Marques, 1998).

The analysis of error autocorrelation was made through the simulation of two different estimation processes. One and two lags were considered and the estimation of a VAR model with just one lag is prosecuted, by using the following system of equations:

$$LNPOS_t = \alpha_{1t} + \beta_{11} LNPOS_{t-1} + \sigma_{12} LNVA_{t-1} + \theta_{13} LNSL_{t-1} + \Omega_{14} TR_{t-1} + u_{1t}$$

$$LNVA_t = \alpha_{2t} + \beta_{21} LNPOS_{t-1} + \sigma_{22} LNVA_{t-1} + \theta_{23} LNSL_{t-1} + \Omega_{24} TR_{t-1} + u_{2t}$$

$$LNSL_t = \alpha_{3t} + \beta_{31} LNPOS_{t-1} + \sigma_{32} LNVA_{t-1} + \theta_{33} LNSL_{t-1} + \Omega_{34} TR_{t-1} + u_{3t}$$

$$TR_t = \alpha_{4t} + \beta_{41} LNPOS_{t-1} + \sigma_{42} LNVA_{t-1} + \theta_{43} LNSL_{t-1} + \Omega_{44} TR_{t-1} + u_{4t} \qquad (4)$$

Where: $t = 1,\ldots 31$ represents the annual observation.

In order to detect the number of cointegration relationships, we follow the procedure proposed by Johansen and Juselius (1990). The principle of the maximum likelihood is taken into consideration, by making use of two distinct statistics: the Trace Statistic (λ_{Trace}) and the Max-Eigenvalue Statistic (λ_{Max}).

	Hypotheses		λ_{Trace}		Hypotheses		λ_{Max}	
EV	**H_0**	**H_1**	**Observed**	**Critical**	**H_0**	**H_1**	**Observed**	**Critical**
0.644317	r=0	r=1	55.51452*	47.85613	r=0	r>0	29.97775*	27.58434
0.474292	r=1	r=2	25.53677	29.79707	$r \leq 1$	r>1	18.64725	21.13162
0.193004	r=2	r=3	6.889522	15.49471	$r \leq 2$	r>2	6.218644	14.26460
0.022868	r=3	r=4	0.670878	3.841466	$r \leq 3$	r>3	0.670878	3.841466

[+] The first column corresponds to the Eigenvalues (EV).; [++] The critical values of the Trace Statistic and of the Max-Eigenvalue Statistic, at a 5% significance level, were collected from Osterwald-Lenum (1992); * It denotes the rejection of the null hypothesis, at a 5% significance level.

Table 5 – The Cointegration Tests

According to the observed values of the first line of the tests previously presented in Table 5, we reject the first null hypothesis of nonexistence of cointegration relationships among the variables. For the remaining lines of test, the observed values are smaller than the correspondent critical values, so the null hypothesis can not be rejected. From this, we consider one cointegrating vector in the subsequent estimation process of the CVAR model, by using one Error Correction Term (ECT).

Dynamic Analysis

The dynamic analysis embraces the evaluation of the causality relationships, and the analysis of the residuals of each equation that is considered in the model specification.

In order to perform a dynamic analysis about the interdependences established between the variables in study, one ECT is considered. For evaluating the causality relationships established among the variables, the concept of causality that was, originally, proposed by Granger (1969) is used. For performing the causality tests for each pair of variables, the Wald statistic is applied.

	$\Delta LNPOS$	$\Delta LNVA$	$\Delta LNSL$	ΔTR
$\Delta LNPOS$	–	0.529888	0.005569	2.542183
$\Delta LNVA$	20.40230*	–	0.001385	4.185001*
$\Delta LNSL$	12.38717*	0.652341	–	2.579075
ΔTR	7.248604*	2.396689	1.383395	–
Block	23.55799*	5.667733	1.590695	7.504378**
ECT	-0.559164*	-0.255198*	-0.128691	-0.011958

[+] Consider the variable or the block, which are expressed in each column, as being the independent variable (that is, the origin of the causality), and the variable that is presented in line as being the dependent variable (that is, the destination of the causality).

[++] The contrasts of the causality of the variables are made by using the χ^2 statistic, with one degree of freedom, while the contrasts of the significance of the error correction term (ECT) are made through the use of the *t* statistic.

* Significance level: 5%.

** Significance level: 10%.

Table 6 – The contrasts of the Granger causalities

According to the results previously presented in Table 6, it must be stressed that only unidirectional causalities are detected. It should also be noticed that only the variable SL is totally exogenous, since it does not present a causality relationship with other variable. The coefficient associated to the ECT is not significant.

Making use of the analysis of the coefficients of the error correction terms, we observe that the variables POS and VA accomplish the adjustment mechanism in relation to the deviations that are observed in the equilibrium relations in the long term.

For a significance level of 5%, it should be enhanced that, in individual terms, the variables: VA, SL and TR, have a significant importance in predetermining the behaviour of the dependent variable that represents the national sportive performance of the MU, that is, the POS.

The joint causality evidenced by the variables VA, SL and TR, for a significance level of 5%, reveals the importance of including this set of variables in the selected model specification.

The dynamic analysis that is only based on the results obtained through the Granger causality tests may be considered insufficient. According to Sims (1980), Goux (1996) and Lütkepohl (1999, 2004), this kind of analysis should be complemented by the analysis of the Variance Decomposition of Cholesky (VDC) and the Impulse-Response Functions (IRF).

Table 7 only presents the results regarding the significant unidirectional causalities. It makes use of the variance decomposition of the forecasting error of Cholesky, and of the coefficients obtained through the simulation of the impulse-response functions.

Causality relationships	Dynamic Analysis	2 Years	10 Years	Sign of the relationship * [+/-]
$\Delta LNVA \rightarrow \Delta LNPOS$	VDC	0,02	28,10	-
	IRF	-0,01	-0,28	
$\Delta LNSL \rightarrow \Delta LNPOS$	VDC	2,33	12,25	+
	IRF	-0,12	0,16	
$\Delta TR \rightarrow \Delta LNPOS$	VDC	14,20	7,23	-
	IRF	0,30	-0,09	

* The sign of the relationship is obtained through the sum of the first ten of IRF coefficients (Goux, 1996).

Table 7 – Dynamic analysis of the significant causalities relationships

Empirical Findings and Discussion

According to the results previously presented in Table 7, the value added (VA) of the MU causes the national sportive performance (POS) in a Grangerian sense. After two years, the VA doesn't present a significant importance, since it has a weight lesser than 5%. Nevertheless, after the third year, the VA starts to have a growing and persistent importance on the determination of the POS. The detection of a negative sign for the accumulated percentage weight should be enhanced. The results of the dynamic analysis ratify the existence of a negative causality relationship between the VA and POS, which was an expected result, in line with the previous findings of Szymanski (1998) and Callejo and Forcadell (2006). In the case of the MU, the bigger is the VA, the smaller will be the number that represents the final position reached in the Premier League Table.

In what respects the causality relationship established between the SL and the POS, after two years, we detect a direct effect which is about 2,3%. Starting from the third year, an improvement on the explanatory power of the SL is also detected. Furthermore, it assumes a growing and persistent nature, around 12%, starting from the tenth period. According to the analysis of the coefficients provided by the simulations of the impulse-response functions, in terms of this specific causality relationship, a positive sign was detected. This means that the past values of SL associated to the MU football brand, precedes lower positions in the Premier League.

The results also revealed that the regulation action associated to the adoption of the Taylor Report (TR) had a direct and significant impact on the MU's sportive performance in a national basis that is represented by the final position in the Premier League Table (POS).

Moreover, a negative relationship between the TR and the POS is found. This relationship is revealed through the negative percentage weight associated with the referred causality relationship. It reveals the importance of adopting the Taylor Report, in terms of the improvement of the sportive performance of MU.

Concluding Remarks

This article is an innovative contribution since the literature so far was focused on efficiency analyses about football clubs, and also on the study of the basic pillars of the corporate strategy of leading international football clubs: sporting, marketing and social. This way, it constitutes a first attempt to analyse the impact of a regulation action that was originated from an exogenous disaster in a football stadium, on the sportive and financial performances of football clubs. Second, it reveals that generating value added at football clubs, especially through the increasing of sales that are associated to the football club brand, is a key process for reaching upper sportive performances. This is especially important because it reveals that public policies oriented to high quality and security in football services contribute for generating value added and pull for the development of sustainable corporate strategies, from the part of football clubs. In this context, the most important active is the football club brand, since this is the basic lever for the development of a sustainable and socially responsible corporate strategy.

The Taylor Effect succeeded so well in the improvement of the general conditions of use of the stadiums, as in the adoption of professionalized business administration models, which culminated in the emission of shares in international stock exchanges. In the case of the Manchester United Football Club, those implications attracted more fans to the stadium, and caused broad changes in the business strategy of the club.

The presence of more fans in the stadium represents higher levels of demand, not only in terms of the sportive show, but also in terms of the increasing merchandising that is transacted with the MU's brand. The substantial improvements introduced in the stadium provided the possibility to offer interrelated services, by using the umbrella effect of the MU's brand. Moreover, the club started to recruit Young Best Players in order to promote the stability of the team, and also to reinforce the brand connection established between the club and the young fans.

The CVAR model allows ratifying the positive Taylor Effect on the national sportive performance of the English football club with the largest international recognition. Moreover, from 1967 to 1997, the sales that are related to the worldwide recognition and valuation of the MU's brand precede lower national sportive performances. This is justifiable by the fact that in the 1990's MU was the most successful English football club, especially in terms of the most prestigious national competition, i.e., the Premier League, nevertheless the first places obtained by the competitors Blackburn Rovers and Arsenal, during the last decade of the XXth century.

The analysis of the significant causality mechanisms that are associated to the sportive performance is especially straightforward, since it considers the final position in the Premier League as the response variable to three different variables: Sales, Taylor Report and Value Added. In simple terms, the sales precede lower levels of sportive performance; whereas the regulation operated through the Taylor Report and the Value Added precede upper levels of sportive performance.

In terms of the main limitations of the present study, it should be stressed that although the period of study: 1967 - 1997 is long, it should be expanded, since the results may be "biased" due to the strong dominance exercised by MU, during the 1990's, in what concerns the final classification obtained in the Premier League. Furthermore, the present analysis has a local focus, that is, the English football competitions. This is justifiable by the special and local incidence of the so called Taylor Report.

In future researches, a special focus should be provided to the realisation of impact analysis about European regulatory reports which are expected to have a direct impact on sportive and financial performances of football clubs. For instance, the impact of dispositions presented at the Nice Declaration, and of the statements provided in the Report of Arnaut (2006) on the reorganisation and the competitive design of the most important and profitable European Competitions: the UEFA Champions League and the UEFA Cup. Last, comparative approaches about the business strategy and football club brands should be developed, in order to better understand the differentiated balancing of sportive and financial performances of football clubs that are recognised in a worldwide basis.

References

Araujo, A., Shikida, C. and Monasterio, L. (2003) Abrindo a caixinha de surpresas: uma análise econométrica ao futebol brasileiro, *Ibmec Working Paper*. http://www.ceaee.ibmecmg.br/wp/wp3.pdf.

Arnaut, J. (2006) *Independent European Sport Review*, Independent European Sport Review, UK Presidency Initiative on European Football. http://www.independentfootballreview.com/doc/A3619.pdf

Brand Finance (2006), *The Brand Finance Index of the Most Valuable European Football Club Brands*, Brand Finance, March 2006, London.

Callejo, M. and Forcadell, F. (2006), Real Madrid Football Club: A New Model of Business Organization for Sports Clubs in Spain, *Global Business and Organizational Excellence,* **26** (1): 51 – 64.

Dickey, D. and Fuller, W. (1979) Distribution of the estimators for autoregressive Time series with Unit Root, *Journal of the American Statistical Association*, **74**: 427–431.

Dobson, S. and Goddard, J. (1996) The Demand for Football in the Regions of England and Wales, *Regional Studies*, **305**: 443-453.

Dobson, S. and Goddard, J. (1998) Performance and revenue in professional league football: evidence from Granger causality tests, *Applied Economics*, **30**(12): 1641-1651.

Dobson, S. and Goddard, J. (2001) *The Economics of Football*, Cambridge, Cambridge University Press.

Goux, J-F. (1996) Le canal étroit du crédit en France, *Revue D'Économie Politique,* **106**(4), Juillet-Août, 1996: 655–681.

Granger, C. (1969) Investigating Causal Relations by Econometric Models and Cross Spectral Methods, *Econometrica*, **37**: 424–438.

Haas, D., Kocher, M. and Sutter, M. (2004) Measuring Efficiency of German Football Teams by Data Envelopment Analysis, *Central European Journal of Operations Research*, **12**: 251-268.

Johansen, S. (1988), "Statistical Analysis of Cointegrating Vectors." *Journal of Economic Dynamics and Control*, **12**: 231-54.

Johansen, S. (1991), "Estimation and Hypothesis Testing of Cointegrating Vectors in Gaussian Vector Autoregressive Models." *Econometrica*, **59**: 1551-80.

Johansen, S. (1994), "The Role of the Constant and Linear Terms in Cointegration Analysis of Nonstationary Variables." *Econometric Review*, **13**: 205 – 230.

Johansen, S. and Juselius, K. (1990) Maximum Likelihood Estimation and Inference on Cointegration with Applications to Money Demand, *Oxford Bulletin of Economics and Statistics*, **52**: 169–210.

Juselius, K. (2007) *The Cointegrated VAR Model – Methodology and Applications*. Forthcoming on Oxford University Press.

Khalid, A. and Kawai, M. (2003) Was financial market contagion the source of economic crisis in Asia? Evidence using a multivariate VAR model, *Journal of Asian Economics*, **14**: 131–156.

Lütkepohl, H. (1999) Vector Autoregressions, *Working Paper of Institut für Statistik und Ökonometrie*, Humboldt, Universitat, Berlin, http://econpapers.repec.org/paper/wophumbsf/1999-4.htm.

Lütkepohl, H. (2004), Recent Advances in Cointegration Analysis, *Economics Working Papers ECO2004/12*, European University Institute, Florence, http://www.iue.it/PUB/ECO2004-12.pdf.

Marques, C. (1998), *Modelos Dinâmicos, Raízes Unitárias e Cointegração*. Edições da Universidade Nova de Lisboa, Lisboa.

Newey W. and West, K. (1987) A simple positive semi-definite, heteroscedasticity and autocorrelation consistent covariance matrix, *Econometrica*, **55**: 703-708.

Osterwald-Lenum, M. (1992) A note with quantiles of the asymptotic distribution of the maximum likelihood cointegration rank test statistics, *Oxford Bulletin of Economics and Statistics*, **54**: 461–471.

Perron, P. (1989), The Great Crash, the Oil Price Shock and the Unit Root Hypothesis, *Econometrica*, **57**: 1361-1401.

Phillips, P. and Perron, P. (1988) Testing for unit root in time series regression, *Biometrika*, **75**: 335–346.

Ramos, P. (2002), *Desenvolvimento de um modelo de análise estratégica para o futebol profissional*, Dissertação de Mestrado em Ciências Empresariais, Faculdade de Economia da Universidade de Coimbra.

Shikida, C. and Shikida, P. (2004), É o futebol o ópio do povo? Uma abordagem económica preliminar, *Ibmec MG Working Paper*. http://www.ceaee.ibmecmg.br/wp/wp19.pdf.

Sims, C. (1980) Macroeconomics and Reality, *Econometrica*, **48** (1): 1–48.

Szymanski, S. (1998), Why is Manchester United so Successful? *Business Strategy Review*, **9** (4): 47 – 54.

Szymanski, S. (2001), *The Economics Design of Sporting Contest: A Review*, London, http://www.atypon-link.com/doi/abs/10.1257/002205103771800004.

Szymanski, S. and Kuypers, T. (1999), *Winners and Losers: The Business Strategy of Football*, Viking Books, London.