Strategy and business economics

Ticket consumption forecast for Brazilian championship games

Previsão de consumo de ingressos para jogos do campeonato brasileiro

Estimación de consumo de entradas de partidos del campeonato brasileño

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Abstract

For the efficiency of sales and marketing management of athletic clubs, it is crucial to find a way to appropriately estimate the level of demand for sporting events. More precise estimates allow for an appropriate financial and operational plan and a higher quality of service delivered to the fans. The focus of this study is to analyze and forecast the ticket consumption for soccer games in Brazilian stadiums. We compare the results of the regression model with normally distributed errors (benchmark), the TOBIT model and the Gamma generalized linear model. The models include explanatory variables related to the economic environment, product quality, as well as monetary and non-monetary incentives that people are given to attend sporting events at stadiums. We show that most of these variables are statistically significant to explain the amount of fans that go to stadiums. We used different measures of accuracy to evaluate the performance of demand forecasts and concluded that Gamma generalized linear model presented better results to forecast the ticket consumption for Brazilian championship games, when compared to a benchmark.
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Keywords: Sports management; GLM; Ticket consumption; Soccer

Resumo

A estimação da demanda em eventos esportivos é uma questão crucial para a avaliação da eficiência de vendas e gestão de marketing de clubes desportivos. Estimativas mais precisas permitem que seja feito um plano financeiro e operacional mais adequado e que o serviço prestado aos fãs possua maior qualidade. O foco deste estudo é analisar e prever o consumo de ingressos em jogos de futebol nos estádios brasileiros. Foram comparados os resultados preditivos do modelo de regressão com erros normalmente distribuídos (*benchmark*), do modelo Tobit e do modelo linear generalizado com distribuição Gama. Os modelos incluem variáveis explicativas relacionadas com o ambiente econômico, a qualidade do produto, bem como incentivos monetários e não monetários que as pessoas possuem para assistirem aos jogos nos estádios. A maioria dessas variáveis foi estatisticamente relevante para explicar a quantidade de público pagante nos estádios. Foram utilizadas diferentes medidas de qualidade de previsão

para avaliar o desempenho das previsões de demanda e concluímos que o modelo linear generalizado com distribuição Gama apresentou melhores resultados para previsão do consumo de ingressos para os jogos do Campeonato Brasileiro de futebol, quando comparados ao *benchmark*.
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Resumen

La estimación de la demanda en eventos deportivos es un tema crucial para la evaluación de la eficiencia de ventas y gestión de marketing de clubes deportivos. Estimaciones más precisas permiten que se cree un plan financiero y operativo más adecuado y que se ofrezca un servicio de mejor calidad a los aficionados. El objetivo de este estudio es analizar y estimar el consumo de entradas para partidos de fútbol en los estadios brasileños. Se han comparado los resultados del modelo de regresión con errores normalmente distribuidos (*benchmark*), del modelo Tobit y del modelo lineal generalizado con distribución Gamma. Los modelos incluyen variables explicativas relacionadas con el entorno económico, la calidad del producto y los incentivos monetarios y no monetarios que se ofrecen a las personas para que asistan a los partidos en los estadios. Se demuestra que la mayoría de estas variables ha sido estadísticamente significativa para explicar la cantidad de personas que pagan para ir a los estadios. Se han utilizado diferentes medidas de calidad de estimación para evaluar el desempeño de las previsiones de demanda y se ha concluido que el modelo lineal generalizado con distribución Gamma muestra mejores resultados para estimar el consumo de entradas de los partidos de fútbol del Campeonato Brasileño, en comparación con el *benchmark*.
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Palavras-chave: Gestão esportiva; GLM; Demanda de ingressos; Futebol

Palabras clave: Gestión deportiva; GLM; Demanda de entradas; Fútbol

Introduction

Soccer plays an undeniably important role not only in the context of Brazilian sports, but also in the world of international sports. Nevertheless, Brazilian soccer clubs, some of them at over 100 years old, have many organizational problems and are, in general, overwhelmed with chronic mismanagement. The professionalization of the sport and its command structures are weak and lag behind the levels of organization and development achieved by its European counterparts.

As the most popular sport in Brazil, 5.7 million fans attended soccer games in Brazilian stadiums during the 2013 season – according to the Brazilian Soccer Confederation (CBF) – an amount that could be considered meager when compared to the 13.6 million fans that attended games in Premier League stadiums during the same season (2012–2013). The flood of European fans to their stadiums, especially since the 1990s, is a direct result of the high organizational standards of the European leagues (Sloane, 1997). These high standards maintained in Europe allow the major clubs to reach maximum attendance capacity in their stadiums for virtually every game of the season. In Brazil, by contrast, the number of fans attending games has been declining over the past decades (Giovannetti, Rocha, Sanches, & Silva, 2006).

Planning is always based on certain assumptions about the future course of events. Future conditions are often difficult to forecast, and can never be predicted perfectly. Yet, the marketer or the administrator must plan and make decisions using what constitutes the best estimate about future developments. Without a proper consumption forecast, the marketing executive cannot determine the type of marketing program to use in order to attain the desired sales and marketing objectives (Santos, Bazanini, & Ferreira, 2014). Therefore, evaluating the consumption potential and preparing a consumption forecast is an important function of sales and marketing managers. Mentzer and Moon (2005) define demand forecast as "a projection into the future of expected demand, given a stated set of environmental conditions". According to them, one of the key measures of sales forecasting performance is the accuracy of the forecast. For this purpose, it is essential to identify and understand the factors, both positive and negative, that influence attendance at sporting events. The aforementioned analyses will prove instrumental in Brazilian clubs as these clubs seek to increase attendance, and will thus contribute to more efficient and professional management of the sport. The focus of this study, therefore, is to examine the ticket consumption for soccer stadiums in Brazil through an analysis of the paying public of the Campeonato Brasileiro Série A (the A league division of the Brazilian championship) between 2004 and 2013. This study is one of the longest investigations ever conducted in sports literature with soccer data.

First, it is necessary to determine which variables influence the consumption of games by using regression models. Three models were fitted: a usual OLS regression model with normally distributed errors; a regression model with a censored dependent variable (TOBIT); the number of tickets sold, which is limited by the capacity of the stadium where each game is played, as proposed by Falter, Pérignon, and Vercruysse (2008); and generalized linear models (GLM) with Gamma distribution to better adjust the positive skewness of the consumption distribution. We will check if the TOBIT and the GLM models could be better to forecast ticket consumption than the usual regression models that have been used in the Brazilian literature (Giovannetti et al., 2006; Madalozzo & Villar, 2009; Melo, 2007; Souza, 2004), which does not use this specific tooling to estimate the demand for soccer in Brazil. Our intention is to fill this gap by providing more accurate estimates for the decision-making process within the ambit of Brazilian soccer clubs, allowing for better in-sample and out-sample demand forecasts.