

The Impact of Air Pollution on Fan Attendance: An Analysis of the Chinese Super League

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Environmental issues have presented significant and complex questions to our social and economic life, including sport (Babiak & Trendafilova, 2011; Inoue & Kent, 2012). In the literature, the discussion of sport and environment is mostly located in the examination of corporate social responsibility (CSR) by inquiring the influence of environmentally friendly practices conducted by sport organizations (Kellison & Mondello, 2011; Trendafilova, et al., 2013; Kassinis & Vafeas, 2006). Nevertheless, limited attention has been given to how the changing conditions of our planet may impact consumer interest in sport. Such inquiry carries particular importance and relevance in the context of China, considering that it has one of the fastest growing sport consumer markets which, in the meantime, suffers from a preponderance of environmental problems (Li, Liu, Lu, & Liang, 2015). With this in mind, this study attempts to investigate the impact of air pollution on fan attendance for the Chinese Super League (CSL).

Specifically, this study approaches the subject through the framework of economic demand theory. Accordingly, live attendance provides a way to estimate the factors which may have significant relationship with direct demand for sporting contests (Borland & Macdonald, 2003). Furthermore, five specific categories of demand determinants are theorized – consumer preferences, quality of viewing, economic, the nature of the sporting contest, and supply capacity (Borland & Macdonald, 2003). Amongst these categories, consumer preferences and quality of viewing are of special importance to this research, where environmental conditions may affect the demand for sport products (Bird, 1982). However, the examination of environmental factors in the literature has predominantly focused on weather conditions such as temperature and precipitation (Bird, 1982, Feddersen & Rott, 2011; Garcia & Rodriguez, 2002). Meanwhile, air pollution presents a challenging and increasingly necessary factor in considering fan attendance. Firstly, air pollution means a variety of negative effects on human health, including the potential to increase the risk of heart failure, lung disease, and others (Carlisle & Sharp, 2001; Vieira et al., 2016). Secondly, watching soccer matches and traveling to games requires an enduring amount of time being exposed to air. Thirdly, citizens are becoming increasingly vigilant of the knowledge of pollution, especially in China. It is a condition that raises collective social anxiety, which also plays an immediate and relevant role for the individuals to plan for everyday activities.

In this study, multiple regression analysis is used to examine live attendance at CSL matches from 2014 till the end of the 2016 season. To date, there has been limited examination of the CSL and other professional sport leagues in China (Watanabe & Soebbing, 2015), with most studies focused on examining the overall market potential of sport brands in China (Bodet & Chanavat, 2010). Despite the limited attention which has been placed on the CSL, the league's growth in the last several years has placed it as one of the top emerging organizations in professional sport, with average attendance per game now ranked in the top five among soccer leagues worldwide. Part of this growth in fan interest has come about because the CSL has most of its franchises located on the Eastern seaboard of China, with teams mostly centered in “mega cities” with large populations such as Shanghai, Beijing, and Guangzhou, which also frequently experience some of the most polluted air conditions in the world (Chan & Yao, 2008). Meanwhile, because of the poor air quality in major urban areas, China has developed one of the most comprehensive system for collecting and disseminating information about environmental conditions on a daily basis, thus allowing us to obtain data on the pollution level for each soccer match as well as the daily warnings posted by media which may also play a role in influencing consumer decisions to attend sporting events (Li et al., 2015).

In order to analyze how consumers are affected by pollution, there is need to construct a demand model that takes into account these environmental factors, while also controlling for other variables (Borland & Macdonald, 2003). Previous studies have used such models to examine how consumer interest in attending professional sporting events may be influenced by price (Coates & Humphreys, 2007; Fort, 2004), weather (Bird, 1982), when matches are held

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(Carmichael et al., 1999), team success and competitive balance (Schmidt & Berri, 2001), and an array of other factors. Thus, following the lineage of sport demand studies, this research develops a model examining demand for match-level attendance at CSL matches by controlling for: on-field performance of teams, the market potential for each team, the weather on the day of the match, timing of matches, as well as measures of air pollution. In regards to the air pollution variables, the Chinese government lists both the air pollution in regards to the exact level of Particulate matter (PM) in the air, as well as the Air Quality Index (AQI) for each day. As such, two models are developed to specifically test whether sport consumers are affected by the actual measure of air quality (PM), and the AQI, which gives a general understanding of air conditions displayed to the public.

Currently, this project is in the stage of data collection as we gather all the daily data for soccer matches and pollution over the last three years, and will be completed in the next few months. Upon acceptance to NASSM, we will present the full results from our model examining several seasons worth of data. In envisioning the results, two potential outcomes may come about from this research. Firstly, if the findings do show sensitivity to air pollution amongst sport consumers, then it would require the teams and the league to reflect on ways to approach the hosting of matches when there are air quality issues. Furthermore, from the league perspective, if air pollution is detrimental to attendance, competitiveness, and the revenue of teams, it will be necessary for the league to consider its own policies for hosting competitions, while also engaging with governmental/environmental policy makers to inform their decision making process. Secondly, if individuals do not show sensitivity to air pollution when choosing to attend sporting events, it would indicate that consumers are willing to place themselves in situations that could have both short and long-term health issues. On one hand, this yields implications for public health and outdoor sport events. On the other hand, it raises questions for ethics in managing sport as well as practical strategies to avoid the quandary of placing individuals' health at risk in order to enhance revenues and profit.