

Minimally sufficient conditions of the public at the stadiums in the lowest levels of football in Brazil.

Felipe Nunes – Universidade Federal de Minas Gerais, Belo Horizonte, Brazil [fasfn@adm.mest.ufmg.br](mailto:fasfn@adm.mest.ufmg.br)

Jonathan Freitas – Universidade Federal de Minas Gerais, Belo Horizonte, Brazil

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## 1. Introduction

The professional football ecosystem in Brazil encompasses four main divisions of the national league, two main interstate championships and another 27 state championships. The great mass of athletes works in the most basic structure of this system, which are state championships. Some of the Brazilian states have many registered clubs, which causes even lower divisions in this structure. At these levels, revenue sources vary from investors, sponsorship, public funds and box office. This work aims to understanding the combinations of factors that cause the public to go to the stadiums to follow the games of these championships.

## 2. Theoretical Background and Literature Review

Brazil has more than 850 professional football clubs and only 128 of these teams compete in one of the four divisions of the national championship. There are also state championships in all 27 units of the Brazilian federation, with a second division in 26 of those states. A few states still have a third division and others have a fourth and fifth division of the state championship (CBF, 2019).

The football clubs in the state of Minas Gerais, that are active, are divided into three levels: Module I, Module II and the so-called Second Division, which in practice is equivalent to the third category. Between 2015 and 2018, Module II was played in two different formats. In the years of 2015, 2016 and 2017 the teams played for 10 rounds and then the six best placed teams faced each other in two rounds in a hexagonal of 10 more rounds. In 2018, 11 rounds were played and the best four went on to a semi-final and final playoff with two matches in each of these stages.

Studies like (Serrano, 2018) and (Gasparetto et al., 2018) point to the importance of regional championships in the Brazilian football ecosystem. Although they are important, these tournaments face a decline in prestige with the public. The work of (Silveira & Melo, 2018) shows the difficulties faced by clubs in the lower divisions in generating income to guarantee the subsistence of these organizations. Among the origins of the resources are the sale of tickets, related products, public resources and local sponsorship. Therefore, for these championships, there is the challenge to attract the public to watch the games in the stadium.

## 3. Research Design, Methodology and Data Analysis

Provided by the Minas Gerais Football Federation we access the game registers of the Module II championships between 2015 and 2018 totalling 332 matches. We removed from the sample the matches that resulted in the defeat by WO of one of the teams and that, motivated by punishment, had been held with the gates closed.

Then, data on stadium attendance rates, proportion of points earned and game revenues were organized. Other data were researched on public access sources, such as the distance between the cities of the teams participating in the game, the average income of the city where the game was played, the year the teams were founded, if there was historical rivalry between the teams and if the game would be played in the host

city of the home team. This last data was necessary because, due to the structure of the stadiums, the Federation can determine the realization of the match in a different place that can hold the event.

The approach chosen to analyse the data was the Coincidence Analysis with the use of the fuzzy-set calibration. This configurational comparative approach allows the understanding of conditions minimally sufficient to cause an event (Baumgartner & Ambühl, 2018). Calibration used the medians for the distribution of stadium occupancy rates as a crossover point. We used this same logic for the calibration of the other factors.

#### 4. Results/Findings and Discussion

The analysis did not find complex causal solutions within the ideal parameters of consistency and coverage proposed by (Baumgartner & Ambühl, 2018). This result does not preclude observing secondary analyses such as evaluating, for example, the existence of minimally sufficient conditions to cause a good attendance rate in stadiums.

These conditions are recognized in the Regularity Theories as conjunctions of factors that may explain the causality of the event, although they do not cover all the possible cases. We found four minimally sufficient conditions of maximum consistency. In three of these conditions, there is the presence of the classification factor of the home team (CLAM) AND absence of the factor that points game town is the same as that of the home team (cinat). These three conditions are in conjunction with a third factor [respectively a low average income of the game city (rmcid), a low average ticket (TM) and a high distance between the cities of the clubs participating in the game (dist)]. The fourth condition presents the presence of good proportion of points earned by the home team (APM) AND absence of the factor that points game town is the same as that of the home team (cinat) AND absence of importance of the round (roda). See Table 1.

Minimally Sufficient Conditions	Consistency	Coverage
CLAM*rmcid*cinat -> OCU	1	0.01559
CLAM*TM*cinat -> OCU	1	0.01400
CLAM*cinat*dist -> OCU	1	0.01066
roda*APM*cinat -> OCU	1	0.00983

*Table 1 - Minimally Sufficient Conditions with maximum Consistency*

The minimally sufficient conditions found with maximum consistency values show the importance of some factors. The absence of the hometown factor, that is, when the match takes place in another city than the host city of the home team, is present in all conjunctions presented. The combination of this element with factors related to the performance of the home team, both the classification of the team in the championship

and its proportion of points earned, may suggest a certain attraction of fans who – not necessarily – are loyal supporters of the teams, but only curious spectators. Other elements pointed out in the combinations, such as low average ticket, low average income of cities, absence of importance of the round and a great distance between the cities, in which the teams participating in the game are located, seem to compose this characteristic of opportunist spectator. In other words, these combinations seem to point to the presence of an audience attracted by the performance of the home team, who are doing games away from their host city and with some other element that contributes to their presence in the match.

To complement this analysis with minimally sufficient conditions, we reduced the values of the consistency parameter to 0.95. This action resulted in four other different conditions, which showed the importance of the rivalry (RIV) factor in the cause of a good stadium occupancy rate. Factors related to performance, such as the ranking of the home team in the championship and its proportion of points earned, make up the combinations again. This point to the importance of a competitive team in the presence of the public in the stadiums. Another factor that repeat under these conditions is that which points to an absence of high average incomes in the city. This element may suggest football as a leisure alternative in cities whose average income is low (See Table 2). These conditions serve as support in the study of the analysis to establish criteria for decision making in relation to the state championships in the future.

Minimally Sufficient Conditions	Consistency	Coverage
CLAM*cinat -> OCU	0.954	0.01575
CLAM*RIV*rmcid -> OCU	0.969	0.09968
RIV*rmcid*APM -> OCU	0.974	0.09252
TM*RIV*rmcid -> OCU	0.958	0.06351

*Table 2 - Minimally Sufficient Conditions with a high level of Consistency*

## 5. Conclusion, Contribution and Implication

The minimally sufficient conditions found denote the relationship between the performances of the home team in motivating the fans to accompany the club in the stadium. It was also possible to note the rivalry as a contributing factor to a good public presence. This study contributes to the work of (Gasparetto et al., 2018) who addresses the importance of state championships for Brazilian football. It also expands the findings of (Silveira & Melo, 2018) about the clubs that dispute the lowest echelons of professional football in Brazil. This work becomes relevant because it addresses a scenario that covers most professional clubs in this country and distant from the eyes of the great public fan of the sport.

As a suggestion for future investigations are the deepening of the relationship between the performance of the teams and the presence of the public in the football stadiums. It is also suggested to investigate the relevance of rivalry as a stimulating element for the public's presence. Finally, the detection of stadium occupation occurring in low-income cities points to the need for a more detailed understanding of this relationship.

## 6. References

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