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Stadium attendance demand during the COVID-19 crisis: Early empirical evidence from Belarus

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Abstract

In this note, we consider early evidence regarding behavioural responses to an emerging public health emergency. We explore patterns in stadium attendance demand by exploiting match-level data from the Belarusian Premier League (BPL), a football competition that kept playing unrestricted in front of spectators throughout the global COVID-19 pandemic, unlike all other European professional sports leagues. We observe that stadium attendance demand in Belarus declined significantly in the initial period of maximum uncertainty. Surprisingly, demand then slowly recovered, despite the ongoing inherent risk to individuals from going to a match.

Keywords: attendance; COVID-19; football/soccer; spectator decision-making; public health

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Introduction

Amid the global health emergency that is the COVID-19 pandemic, for policymakers, better understanding of the behavioural responses to government measures (e.g., promoting social distancing) is critical to control the spread of the virus. Naturally, several important questions arise: Are strict policy measures necessary to alter citizen behaviour? And, if so, how long will those behavioural changes last? Or do citizens self-regulate when their risk of infection is high, thus allowing the government to pursue more relaxed measures?

In this note, we explore stadium attendance data to look at citizens' responses to public policy measures within Belarus, where the government has chosen one of the most relaxed public policy stances to the virus in the world.[1] We observe stadium attendances at football matches in the country's top professional league, the Belarussian Premier League (BPL). These attendances represent a willingness to undertake a public activity in potentially crowded settings, which can affect the spread of airborne viruses like influenza and coronavirus, both according to common sense and recent evidence (e.g., Cardazzi, Humphreys, Ruseski, Soebbing, and Watanabe, 2020).

Although there already exists a rich and continuously growing literature on the potential determinants of stadium attendance demand,[2] there is surprisingly little evidence on whether sports fans adapt their behaviour during a public health emergency. To the best of our knowledge, only two empirical contributions have explored this increasingly important phenomenon. First, Gitter (2017) analysed stadium attendance demand for Mexican League Baseball games during the H1N1 outbreak, observing a sharp decrease in attendances as reports of influenza-like illnesses spread. Second, Reade and Singleton (2020) studied initial football spectator responses to the COVID-19 outbreak in the top five European leagues, before the forced lockdown in March 2020, finding mixed results on the effects

[1] The Oxford COVID-19 Government Response Tracker ranked Belarus as having the least strict measures apart from Nicaragua (cf., Hale, Webster, Petherick, Phillips and Kira, 2020).

[2] Matchday income, i.e., revenue from ticket sales, as well as from concessions, parking fees etc., corresponds to about 15 percent of the total turnover of major European football clubs (Deloitte, 2020). For sports economists, understanding the potential determinants of football stadium attendance demand better has, therefore, become a priority in the last decades. A large body of literature models stadium attendances in, for example, England (e.g., Cox, 2018), France (e.g., Scelles, Durand, Bonnal, Goyeau, and Andreff, 2013), Germany (e.g., Pawlowski and Anders, 2012), Italy (e.g., Domizio and Caruso, 2015), and Spain (e.g., Buraimo and Simmons, 2008). In contrast, only a few authors (e.g., Pawlowski and Nalbantis, 2015) have explored the demand for small football leagues, where gate revenues are normally an even more significant part of the revenue mix (UEFA, 2020a).

of the pandemic: there was a negative relationship between the increasing domestic virus threat and attendance demand in England, Germany, and Italy, but not in France and Spain.[3]

Here, we observe that stadium attendance demand in Belarus declined significantly in the initial period of maximum uncertainty and risk, but then slowly recovered. As the pandemic threat remains, however, stadium attendance demand for BPL football has not yet returned to the previous year's numbers.

Our results add to the economic literature in three important ways. First, we contribute to the emerging stream of empirical research exploring the potential impacts of COVID-19 on societies and individual behaviour, especially relating to professional sports (e.g., Ahammer, Halla and Lackner, 2020; Bryson, Dolton, Reade, Schreyer, and Singleton, 2020; Reade, Schreyer, and Singleton, 2020). Second and more generally, we provide new evidence on the effects of exogenous shocks on spectator decision-making (e.g., Frevel and Schreyer, 2020), thus contributing to the ever-growing literature modelling stadium attendance demand. Third, we provide a glimpse of a small and previously neglected sports market, i.e., the BPL. So far, few authors from the field of sports economics (e.g., Buraimo, Tena, and de la Piedra, 2018) have explored the national leagues outside of the football powerhouses, even though these competitions attract substantial domestic demand.

Background

While most European football leagues were postponed indefinitely or even cancelled by mid-March, to help mitigate the spread of COVID-19 (cf., Tovar, 2020), the Belarusian government, in contrast, dismissed the threat to public health and decided to proceed with sporting events as planned (e.g., Reuters, 2020a). As such, the BPL season kicked-off on March 19th, with two matches played in Minsk and Soligorsk in front of 730 and 1,453 spectators, respectively.[4] The 2020 campaign even continued when two games featuring Football Club (FC) Minsk had to be rescheduled due to suspected cases of COVID-19 among the team's players (Reuters, 2020b). Matchday income accounts for a mere two

[3] As Reade and Singleton (2020) add, this finding might at least partially stem from the use of aggregated data on the number of distributed tickets, most of them part of a season ticket bundle, that are typically administered well in advance of a match and, thus, might ultimately capture intent rather than actual behavior (cf., Schreyer, 2019).
[4] As the BPL is currently running from March to late November/early December, throughout the manuscript, we use the terms season and year synonymously.

percent of the BPL's total turnover (UEFA, 2020a) and, as such, the clubs are largely independent from this revenue stream. This does not imply that the BPL did not profit financially from being one of the only professional football leagues in the world taking place throughout March and April 2020.[5] The BPL was able to sell its international broadcasting rights to more than 10 countries, including India and Russia (Reuters, 2020c).[6]

Note that, while Belarus might be an outlier in policy terms, it is not an outlier in football terms. The nation's domestic competition is ranked 25th within Europe (UEFA 2020b), and its average match attendance in recent seasons, at 1,762, is higher than in Northern Ireland, Slovakia and Iceland, countries that all qualified for the 2016 UEFA European Championship tournament.[7]

Data and Methodology

Our data set contains stadium attendance information from all BPL clubs during the 2016, 2017, 2018 and 2019 seasons, and the first half of the 2020 campaign;[8] i.e., an observation period consisting of 1,080 BPL matches played on 135 consecutive matchdays.[9] We obtained these data, and most of the remaining information,[10] from worldfootball.net. In line with most stadium attendance studies (cf., Tainsky and Winfree, 2010), we cannot control for either the number of season ticket holders or the

[5] According to the CNN, in mid- April 2020, only five out of FIFA's 211 national associations were still running a football competition: Belarus, Burundi, Nicaragua, Tajikistan, and Taiwan (CNN, 2020).

[6] As European football leagues are increasingly seeking international broadcasting presence to diversify their income mix (e.g., Schmidt and Holzmayer, 2018), the sale of additional international media rights marks a significant, though probably temporary, competitive advantage for the BPL. Although we are not aware of the generated income, such additional revenue, as one reviewer has rightly pointed out, is likely to have a significant effect on the league's development. In the English Premier League, for example, the revenue from international media rights was about 40 percent recently (e.g., Schreyer, Schmidt, and Torgler, 2018).

[7] Author's own calculations based on data from worldfootball.net.

[8] We consider the year 2016 a natural starting point for our analyses, as the number of participating teams (16) was lower in the preceding year(s).

[9] In the final analysis, however, we had to exclude 17 games. In 2020, two games featuring FC Minsk had to be rescheduled due to suspected cases of COVID-19 among the squad (Reuters, 2020b). As of today, these matches have not been rescheduled. Further, in 2019, Torpedo Minsk withdrew from the BPL due to a lack of financial resources and their remaining matches were forfeited in favor of their opponents.

[10] The official information on active COVID-19 cases, as well as on recoveries and deaths, were obtained from Wikipedia. Although the official numbers have sparked some skepticism among independent journalists, not least because the President of Belarus declared that nobody would die there from COVID-19 in mid-April (e.g., Reuters 2020d), it is, ultimately, the only major information available to a spectator during his/her decision-making process. According to the Economist Intelligence Unit's (EIU) Democracy Index 2019 (EIU, 2020), Belarus, classified as Authoritarian regime, ranks 150 out of 167 countries, that is, slightly above China (153) but below Russia (134).

number of no-shows; we can only explore behavioural intentions.[11] On average, stadium ATTENDANCE demand, our dependent variable here, was 1,837 spectators per BPL game. Although reliable stadium capacity information was not available for all BPL games, an occupancy rate of just 28 percent, on average, is a strong indicator that capacity constraints tend not to be an issue for the BPL.

To answer whether spectator demand decreases during a public health emergency, we employ ordinary least squares (OLS). We conduct our analysis using several different independent variables: (1) COVID-19, a dummy variable that takes the value of one after the emergence of the virus, i.e., during the first half of the 2020 BPL campaign, and zero otherwise; (2) ACTIVE, including its squared term, which is an integer giving the number of active COVID-19 cases in Belarus on the day before a matchday; (3) DEATHS, including its squared term, giving the number of cumulative deaths by COVID-19 reported on the day before a matchday. We expect a non-linear relationship between ATTENDANCE and both ACTIVE and DEATHS, as it seems likely that potential spectators adjust to the virus threat over time. To address heteroskedasticity and because these independent variables do not substantively vary over the matches within a round of fixtures (e.g., eight matches over a weekend), we estimate two-way cluster robust standard errors by both the identity of the home team and the rounds of each season.

Results

Pre-COVID-19, stadium attendance demand for Belarusian football was on the rise. We observe, on average, about 1,476, 2,011, 1,922, and 2,471 spectators per match in the years 2016, 2017, 2018, and 2019, respectively. In 2020, this trend ended abruptly.

- - - Insert Figure 1 about here - - -

To analyse the responses of football spectators to the imminent pandemic threat, we first provide some graphical evidence. As Figure 1 shows, BPL stadium attendance demand appears to have decreased dramatically during the first half of the 2020 campaign. For example, in 2020, we observe, on average, 1,309, 1,120, and 328 spectators on the three first matchdays, compared with 2,759, 3,195, and 3,273 spectators in the year before. Similarly, stadium attendance demand for BPL matches was

[11] For examples of the few stadium attendance demand studies employing behavioral data see Sacheti, Paton and Gregory-Smith (2016), Schreyer, Schmidt, and Torgler (2016), and Welki and Zlatoper (1999).

1,600, 2,250, 2,066, 2604, and 811 in the first of half of the 2016, 2017, 2018, 2019, and 2020 seasons, respectively.

- - - Insert Table 1 about here - - -

In Table 1, we present our regression results using the natural logarithm of attendance as our dependent variable. We first report the results from three different models: (1) including only our CORONA dummy; (2) adding a rich set of controls (e.g., key fixtures, market values for both the home and away teams, and seasonal progress); and (3) further adding home-team fixed effects. In specification (4), we present the results from an additional robustness test exploring a reduced dataset that contains stadium capacity information. We observe a robust and statistically significant negative effect of CORONA on ATTENDANCE, indicating that spectator interest in BPL football decreased substantially in the first rounds of the 2020 campaign.

To explore a potential habituation effect among spectators, in Table 1, we also present additional specifications, with the two alternative independent variables, (5) ACTIVE and (6) DEATHS. These are intended to capture the variation in the perceived significance of the threat over time. Interestingly, we find the expected non-linear effects, indicating that stadium attendance demand in Belarus declined significantly in the initial period of maximum uncertainty, but then slowly recovered. Specifically, as can be seen in Figure 2, we observe a turning point at around 14,000 active cases and 190 official deaths; i.e., in late May. As the season progressed, it seems that an increasing number of potential spectators were attributing less danger to the threat. This observation mirrors recent findings from terrorism research, where Frevel and Schreyer (2020) observed that stadium attendance demand in the German Bundesliga initially declined significantly during the first two weeks after the November 2015 Paris attacks, but then quickly recovered.

- - - Insert Figure 2 about here - - -

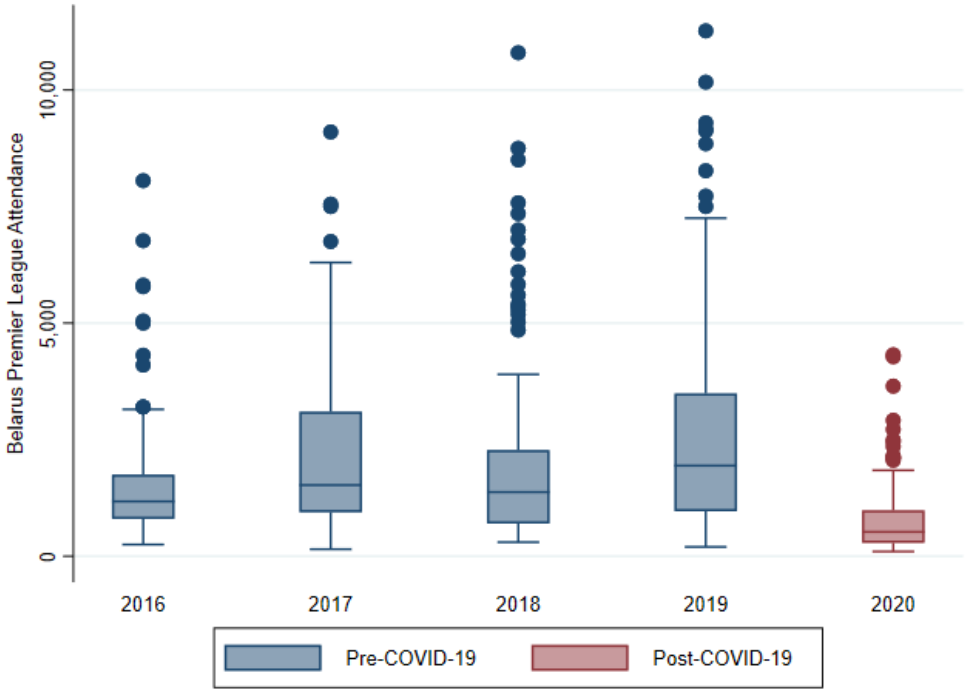
Conclusion

In this study, we explore an increasingly important question: What happens when fans can attend sports events, even if for public health reasons they should preferably not do so? Analysing match-level data from the first half of the 2020 BPL campaign, we find robust evidence that most of these football fans, though not all, decided to stay at home in the initial period of maximum COVID-19 uncertainty. This

effect quickly reverted, indicating that potential spectators adjusted their perception of the threat over time, despite the continued risk. For public policymakers, who must balance economic, social and public health interests as a crisis like COVID-19 unfolds, our findings imply that football fans are likely to return to the stands sooner rather than later once European stadiums are re-opened.

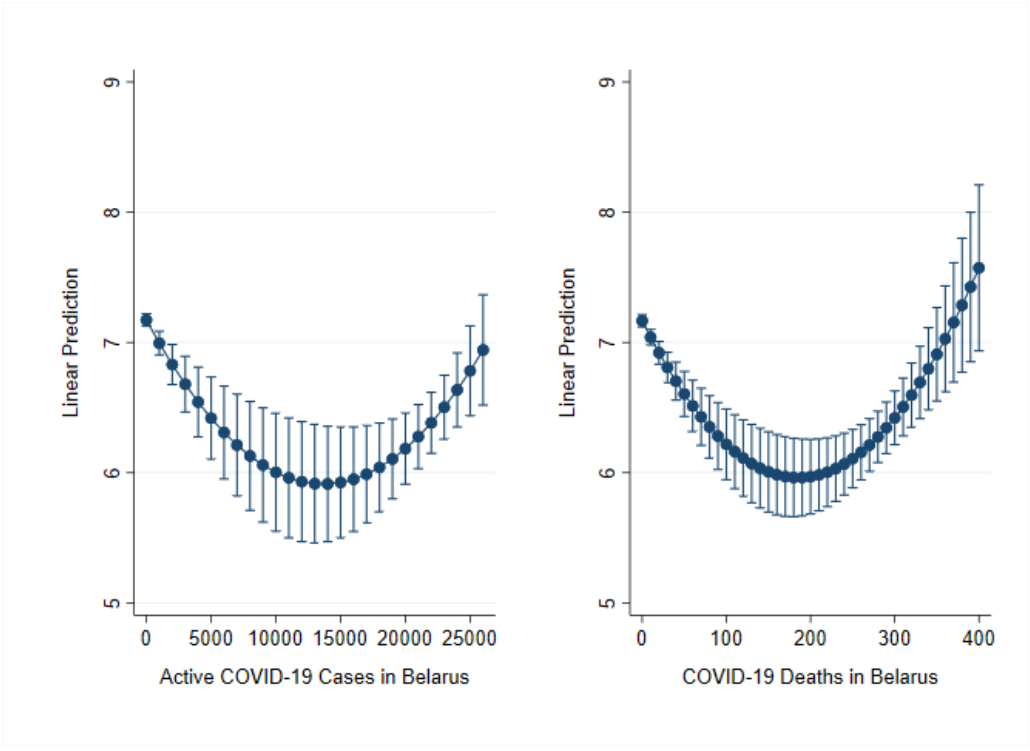
Figures and Tables

Figure 1. **Belarusian Premier League stadium attendance demand in the first half of the season pre-/post-COVID-19**



Abbreviations and Notes: Author calculations using N = 598 Belarusian Premier League matches scheduled between matchday 1 and 15; worldfootball.net

Figure 2. **Habituation effect among Belarusian Premier League spectators**



Abbreviations and Notes: Predictive margins are displayed with 95% confidence intervals, as estimated from regression model specifications (5) and (6) in Table 1

Table 1. Estimated effects of COVID-19 on stadium attendance demand in the Belarusian Premier League

	(1)	(2)[4]	(3)	(4)	(5)	(6)
CORONA[1]	-0.874*** **0.125**	-1.145*** **0.014**	-1.062*** **0.132**	-1.103*** **0.138**		
ACTIVE[2]					-0.185*** **0.041**	
ACTIVE*ACTIVE					0.007** **0.002**	
DEATHS[2]						-0.130*** **0.020**
DEATHS*DEATHS						0.003*** **0.001**
CONTROLS[3]	No	Yes	Yes	Yes	Yes	Yes
STADIUM CAPACITY	No	No	No	Yes	No	No
HOME TEAM (FEs)	No	No	Yes	Yes	Yes	Yes
N	1,063	1,063	1,063	925	1,063	1,063
R^2	0.088	0.475	0.718	0.707	0.679	0.677

Abbreviations and notes: All figures are rounded. Robust standard errors are in bold; †, *, ** and *** indicate statistical significance at the 10% ($p < .10$), 5% ($p < .05$), 1% ($p < .01$) and .01% ($p < .001$) level, respectively. [1] Dummy variable; [2] 1000s of active cases and 10s of deaths; [3] To explore the robustness of the observed relationship, we further include a basic set of well-established explanatory variables. More precisely, we control for international talent (as proxied by the number of foreign players), team strength of both the home and away team, respectively (as proxied by market values; cf., transfermarket.com), scheduling effects (as proxied by fixture fixed effects for the seven most frequent fixtures; i.e., Saturday, 14:00/14:15; Saturday, 15:00/15:15, Saturday, 16:00/16:15, Sunday, 16:00/16:15, Sunday, 14:00/14:15, Sunday, 15:00/15:15, and Sunday, 11:00/11:15), and seasonal progress (as proxied by a round of fixtures). Extended specifications are available from the authors upon request; [4] Results are robust to the inclusion of an explanatory variable capturing lagged attendance, which is positive and significant, although the overall increase in the explained variance is merely a few percent points.

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