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# **Does a super league tournament harm domestic leagues? Evidence from basketball's Euroleague**

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# Does a super league tournament harm domestic leagues? Evidence from basketball's Euroleague

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## ABSTRACT

*Sports leagues are traditionally considered as natural monopolies. Therefore, understanding how different sports competitions interact is a fundamental economic question. In particular, it is unclear how a closed (or semi-closed) elite tournament affects the level of competition in domestic leagues. On the one hand, it facilitates access to more financial resources that can increase the gap between big and small teams at the national level. But, on the other hand, participating in more competitions could also imply more fatigue and lack of concentration on the domestic league, given the greater demand that is placed on playing talent. This paper studies the effect of participating in basketball's Euroleague tournament on team performance in eight national leagues. We find that Euroleague participation harms national performance, reducing the probability of victory by around 9% in 'big' leagues (i.e. those with the strongest teams). However, no significant effect was found for the rest of the leagues. A potential transmission channel for this effect is the higher reduction in the number of days between matches. Overall, the present paper suggests that a superleague tournament could contribute to reducing the gap between big and small clubs, at least in the strongest national leagues. We discuss the political implications of this result.*

**Keywords:** *OR in sports, basketball, Euroleague, difference-in-differences, heterogeneous treatment effects.*

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## 1. Introduction

Understanding the characteristics of sports markets is fundamentally an economic question. At the time when sports economics emerged as a field of study, Neale (1964) identified one of the most distinctive peculiarities of professional sport, the so-called *Louis-Schmelling Paradox*: in contrast to other industries, a monopoly is disastrous for professional sports clubs because competition increases interest in a sports tournament. However, Neale (1964) states that this apparent contradiction happens because the firm, i.e., the decision-making unit, in the sports industry is the league, rather than individual clubs.

One important consequence is that sports leagues are natural monopolies with multiple leagues serving the same market unlikely to coexist except in some rare cases.<sup>4</sup> However, for a long time, we have observed that national and continental tournaments have coexisted in many team sports outside North America. A possible explanation is that two competitions may form part of a tiered structure. For example, in association football, the current UEFA Champions League can be seen as a higher division for clubs with excellent performance in their national leagues. However, this situation is not without problems. In particular, it can be argued that uncertainty about qualifying for the top-tier continental tournament may discourage clubs' investment and sponsorship decisions as big clubs need security about their future revenue sources. To avoid such a problem, we observe some initial attempts in some sports to move to closed or semi-closed continental tournaments where some top clubs can secure a permanent spot in the tournament. A prominent example was the proposal to create a football European Super League in 2021. This idea received a hostile reception, critics

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<sup>4</sup> Neale (1964) develops four different stories of interleague business competition: (1) the joining of competing leagues; (2) bankruptcy for one of them; (3) the survival of two or more leagues that are not economically competitive; and (4) the survival of two or more leagues that are economically competitive (and possibly sportingly competitive). He indicates that the third case is rare while the fourth case depends on the demand and cost functions.

claiming that it would ‘destroy’ domestic leagues<sup>5</sup>. Behind the criticism, Neale (1964)’s economic argument, of whether two or more competing leagues could co-exist in the long run, is latent. Thus, it would be reasonable to expect that clubs in the top league would gain access to more resources increasing their strength relative to clubs that compete only at the national level. This would decrease the competitive balance in the national leagues, reducing consumer interest. Moreover, more humble clubs may lack incentives to compete in national leagues as they feel their opportunities to access a higher league are ‘closed’. However, this could be counteracted by another effect, participation in more tournaments by top clubs could also mean more fatigue and dispersion of attention. While this is purely an empirical question, if the second effect dominates, a closed continental league could reduce the gap between the top and the rest of the teams at the national level, making the competition more interesting.

The present paper presents an empirical study of the consequences of implementing a semi-closed top tournament on domestic leagues. We employ match-level data from the basketball Euroleague for seasons 2011/2012 to 2018/2019 inclusive. Although this competition has gone through different structural changes (see Section 3 for a description), as far as we are concerned, it represents the first attempts in team sports to organise a trans-national tournament in which some top clubs had a guaranteed place with a guaranteed number of matches (Di Mattia and Krumer, 2023). Using difference-in-differences models of intertemporal treatment effects, we analyse how participation in the Euroleague affects national league performance. To perform this analysis, we distinguish between two groups of national leagues. The first group (denoted by ‘big leagues’ henceforth) consists of national

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<sup>5</sup> The idea of the football Super League sparked strong reactions in the media. For some examples, see <https://www.theguardian.com/football/2021/apr/19/premier-leagues-other-14-ponder-response-to-breakaway-threat> or <https://www.90min.com/posts/javier-tebas-explains-how-super-league-would-destroy-european-leagues>.

leagues which, in at least one season had one club in the Final Four of the Euroleague during the analysis period.<sup>6</sup> It includes Greece, Russia, Spain and Turkey. The second group ('small leagues' henceforth) are the remaining national leagues in the data: France, Germany, Italy and Poland. To preview, we find that Euroleague participation harms performance in the domestic league, reducing the probability of victory in a match by around 10%. However, this effect is significant only in big national leagues. A potential transmission channel for this effect is the reduction in the number of days between matches, which on average is around two days. Interestingly, this effect is not well understood in the betting markets, which predict an improvement in domestic performance by participants in small leagues and no effect in big leagues.

The remainder of this article is structured as follows. The next section discusses how the paper contributes to the existing literature. Section 3 explains the main characteristics of the Euroleague, and Section 4 presents the data. We discuss the econometric strategy and show estimations results in Sections 5 and 6 respectively. The following section studies the transmission channels, and Section 8 estimates bookmakers' reactions to participation in the Euroleague. Section 9 draws final conclusions.

## **2. Related literature**

This paper relates to a large literature that assesses the importance of fatigue in influencing productivity in sport activities. These papers can be grouped into two sets, which focus on either travel distance or resting days. For the first group, Pollard (1986), in his seminal paper,

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<sup>6</sup> The Final Four is the last stage of the Euroleague. It consists of two semi-finals and a final match to determine the champion. All Final Four games are played in the same city. The venue changes from season to season.

found that travel fatigue plays a minor role in explaining home advantage in English football. Thus, it was familiarity with the stadium rather than fatigue that appeared to be more important in accounting for home advantage in that setting. More recent contributions by Oberhofer *et al.* (2010), Nutting (2010) and Nichols (2014) assessed the importance of travel distance on home advantage for the German Football League, the National Basketball Association (NBA) and the National Football League respectively. Similarly, Carter (2017) studied how the distance to the neutral court where the match took place affected team performance in the National Collegiate Athletics Association basketball tournament. Overall, these papers found that travel distance contributes to a small increase in home advantage. However, the effect is not monotonic but decreasing.

Among the second group of papers, Entine and Small (2008) and Scopa (2015) found that resting days did not significantly impact team performance in the NBA and the soccer World Cup and European Football Championship respectively. Moreover, results in Scopa (2015) indicate that, perhaps due to better conditions and preparation, the effect of fatigue on performance is now less important than it was in the past. Resting days could also be relevant in individual sports. For example, Pina (2019) found that surfers with more resting days generally had an increased probability of qualifying for the next round in the ASP World Tour. However, an excessive number of resting days (higher than five) did not positively affect performance.

Unlike the literature discussed in the preceding paragraphs, the present paper studies the impact of participating in a super league on domestic performance. Thus, while the fatigue induced by playing more matches against superior opposition plays a role in this analysis,

many other factors may also explain the effects of participating in a super league. First, being involved in more than one competition not only implies fatigue but also spreads attention and induces higher levels of psychological stress. Second, a super league could also have a positive effect on domestic performance by generating more financial resources for participating clubs, which could then be invested in more or better players.

There is a paucity of literature analysing the interaction of national and European competitions. Poli *et al.* (2015) illustrated with comprehensive descriptive statistics the impact of participating in the UEFA Champions League in the short, medium and long run. Their results show that participation in UEFA club competitions is uncorrelated with results in national leagues. In a more recent contribution, Cabras *et al.* (2022) estimated the impact of UEFA Champions League matches on team performance in national leagues by employing a model that controls for an extensive set of confounders (i.e. indicators of strength, fitness, previous performance, etc.). They found that a UEFA Champions League match within the previous or the following three days worsened performance in domestic leagues. The size of the effect is small (a maximum of 0.2 percentage points reduction in the probability of winning) but significant at conventional levels and especially important to relatively smaller clubs. Thus, Cabras *et al.* (2022) focus on the effect of playing a recent UEFA Champions League match using weeks without European matches as counterfactuals. But here our interest is not in the fatigue generated by crowded schedule, but in the consequences of taking part in the Euroleague.

Moffat (2020) analyses the consequences of participating in the UEFA Europa League group stage on national league performance. The paper found that taking part in the UEFA Europa

League positively affected the domestic performance of clubs that do not belong to the five big leagues. However, an important difference between our analysis and the paper by Moffat (2020) is that our focus is on the impact of a super league tournament. By contrast, the Europa League in football is a second-tier tournament in terms of importance (behind the UEFA Champions League), and it does not guarantee a minimum of matches each season for the contending teams. Thus, this paper contributes to the previous literature by providing the first study of the consequences of participating in a super league tournament for club performance in national leagues.

### **3. The Euroleague in basketball**

In 2000 a group of elite European basketball clubs created a new tournament outside the jurisdiction of FIBA, which from 1958 was the organiser of the top-tier European club competition, the FIBA European Champions Cup. Thus, in the 2000–2001 season there were two top European professional club basketball competitions: the FIBA SuproLeague (under the umbrella of FIBA) and the Euroleague. However, from the following season (2001-2002), the Euroleague Basketball took over the European professional club competitions while FIBA remained in charge of national team competitions.

Despite a failed attempt by FIBA to re-introduce a new top tier club competition, in November 2015 Euroleague Basketball and IMG signed a highly profitable 10-year agreement. The deal guaranteed €630 million over 10 years, with projected revenues of around €900 million. Thus, starting with the 2016-17 season, Euroleague changed into a true league format with a double round robin league regular season followed by a series of play-off games and a final four. While the criteria for participation has changed over time, the



Euroleague operated as a semi-closed league with the biggest European clubs guaranteed a place.

Thus, the new league format guaranteed a number of attractive fixtures every year. Some clubs, labelled as Licensed Clubs, secured their berth in the tournament with a decennial licence. Other clubs could join the Euroleague in different ways: through the benefit of a wild card; having won the EuroCup in the previous season; or performing well in their national leagues.

This positively affected consumers' interest in the competition and "enabled broadcasters and brands to feel confident in increasing the scale and duration of their investments."

(SportBusiness, 2019). For example, EuroLeague increased its revenues from the sale of audiovisual rights from €15.9M in the 2015/16 season to €32.3M in the 2017/18 season (Di Mattia and Krumer, 2023). Moreover, growing interest in the Euroleague has been especially evident in the younger population (SportBusiness, 2019). It also increased aggregate attendance but, perhaps due to the larger number of matches, reduced attendance per game (Di Mattia and Krumer, 2023).

However, playing a continental double round-robin league tournament also means a larger number of games for the competing clubs, which, in most cases, had to play both Euroleague and domestic league games on a weekly basis. In season 2016-17, the competition changed to a league format, with sixteen teams playing each other in a home-and-away round-robin competition. In total, this amounted to a minimum of 30 games. The number of games

increased even further for the top eight teams in the regular league as they had to play play-offs and, if they progressed, additional matches in the final four.

#### **4. Data**

We use domestic competition data across eight countries (France, Germany, Greece, Italy, Poland, Russia, Spain and Turkey). For all these countries, the domestic regular seasons normally starts in September or October and concludes in April or May of the following calendar year. Depending on the number of teams in the domestic league of that country in a given season, the number of games in the league ranges from 240 to 306. Usually, each team plays against each other team on two occasions, once at home and once away. This makes up the regular seasons. Following the regular season, the top teams, usually the top eight depending on the size of the league, compete in the playoffs, a post-regular season knock-out competition that determines the champion for that season.

In addition to the domestic competition data, we also have data for all teams that competed in the Euroleague. The Euroleague matches are concurrent with the domestic matches.

Therefore, those teams participating in the Euroleague must balance the challenges of domestic and European competitions throughout the season. The data for the domestic competitions and the Euroleague are for the seasons 2011/2012 to 2018/2019 inclusive. We limit our analysis to this period as the seasons thereafter were atypical, i.e., the 2019/2020 season was interrupted by Covid-19 and many matches were cancelled, and the seasons that followed could be characterised as recovering from Covid-19 and are therefore likely to be a departure from the norm. We also confined our analysis to the regular season of domestic leagues to have a comparable sample of games across seasons.

Our unit of observation is club-match in a given season, and as such, each match is observed twice, once with the home team as the subject team and once with the away team as the subject team. We establish two response variables. The first is the *score difference* which is the difference in points between the subject and the opposing teams, whilst the second is a dichotomous variable that takes the value of 1 if the subject team won the match and 0 otherwise.

The treatment variable is an indicator of Euroleague participation which takes value 1 if the team participated in the Euroleague in the current season. We employ a set of covariates that capture match and team characteristics that can be helpful in predicting the outcome of the match. In particular, as each pairing is observed twice, once with the home team as the subject and once with the away team as the subject, we introduce a dummy variable *home* which takes the value 1 if the subject team is the home team and 0 if it is the away team. The effect of home team advantage on sports performance is very well established in the literature (Carron *et al.*, 2005,) with the received wisdom being that home teams have an advantage over visiting rivals. It is expected that playing at home is likely to have a positive and significant impact on score difference and the likelihood of victory.

We also look to capture the effects of indicators of club strength on performance. These confounding variables are observed before the treatment effect takes place to avoid endogeneity issues. The first set of covariates includes the average performance of the subject team and of its opponent in the immediately preceding season. They are denoted by *%Team victories in previous season* and *%Opponent victories in previous season*. Another dimension

to prior performance that is likely to predict score difference and the likelihood of victory is whether either the subject team or the opponent were the Euroleague champion or finalist in the previous seasons. Clubs which participated in the Euroleague finals in the preceding season will by definition be some of the strongest teams in the league. These variables are also defined for the reference and the opponent team, resulting in the following four variables: *team last Euroleague champion*; *opponent last Euroleague champion*; *team last Euroleague finalist*; and *opponent last Euroleague finalist*. Similarly, dummy variables for the subject team and opponent as the domestic champion and finalist in the preceding season are included, hence the variables: *team last league champion*; *opponent last league champion*; *team last league finalist*; and *opponent last league finalist*. The final covariate captures whether the opposing team had participated in the Euroleague in the previous season hence *opponent Euroleague participation*.

The econometric analysis in subsequent sections is based on comparing the performance in the domestic league in two consecutive seasons (controlling for the set of covariates defined in the previous paragraph) of (1) teams that join the Euroleague compared to a control group of non-participating teams in the two seasons; and (2) teams that leave the Euroleague compared to a control group of participating teams in the two seasons. Thus, to conduct the analysis, it is essential to have a set of clubs that switch into the Euroleague every season. Table 1 shows information about such clubs. There are treated observations every season. Moreover, every country league, except Greece, had at least one switching club in the Euroleague.

**Table 1.** Clubs joining and leaving the Euroleague every season in the sample period.

Season	Joining clubs	Leaving clubs
2012-13	Alba Berlin Besiktas Chalon/Saone Khimki Moscow Rytas	Bilbao Galatasaray Nancy Unics Kazan
2013-14	Bayern Galatasaray Lokomotiv Kuban Nanterre Strasbourg Zielona Gora	Alba Berlin Besiktas Cantu Chalon/Saone Khimki Moscow
2014-15	Alba Berlin Limoges Nizhny Novgorod Sassari Turow Zgorzelec Unics Kazan Valencia	Bamberg Lokomotiv Kuban Nanterre Strasbourg Zielona Gora
2015-16	Bamberg Khimki Moscow Lokomotiv Kuban Pinar Karsiyaka Strasbourg Zielona Gora	Alba Berlin Galatasaray Nizhny Novgorod Turow Zgorzelec Unics Kazan Valencia
2016-17	Galatasaray Unics Kazan	Bayern Khimki Moscow Limoges Lokomotiv Kuban Pinar Karsiyaka Dinamo Sassari Strasbourg Unicaja Zielona Gora
2017-18	Khimki Moscow Unicaja Valencia	Darussafaka Galatasaray Unics Kazan
2018-19	Bayern Darussafaka Gran Canaria	Bamberg Unicaja Valencia

## 5. Modelling approach

We aim to estimate the impact of participation in the Euroleague on team performance in domestic competition at the match level. Every team has a treatment (participation in Euroleague) that is not necessarily staggered. However, it lasts, at least, for the whole season. A group ( $g$ ) is defined as all the match-team observations that receive the same treatment (Euroleague participation) in a given season. Thus, the response variable  $y_{i,g,s}$  indicates match performance for team  $i$ , in game  $g$  and season  $s$  and  $D_{i,g,s}$  its associated treatment status. Based on this notation, we denote the potential outcome with and without treatment by  $y_{i,g,s}(1)$  and  $y_{i,g,s}(0)$ . Following similar arguments as de Chaisemartin & D'Haultfoeuille (2020), the average treatment effect of Euroleague participation for any group in a season is defined as:

$$ATE_{g,s} = \frac{1}{N_{g,s}} \sum_{i=1}^{N_{g,s}} (y_{i,g,s}(1) - y_{i,g,s}(0)) \quad (1)$$

where  $N_{g,s}$  is the total number of observations in group  $g$  at season  $s$ . Given that Euroleague participation affects different groups and seasons, the expected average treatment effect can be defined as the weighted sum of the  $ATE_{g,s}$  across  $g$  in season  $s$  where the weights are given by the proportion that  $N_{g,s}$  represent in the total number of observations ( $N$ ).

We initially analyse the impact of Euroleague participation on teams' performance employing the following standard two-way fixed effect (TWFE) with group and seasonal effects:

$$Y_{i,g,s} = \gamma_s + \lambda_g + \beta D_{g,s} + \sum_{j=1}^k \theta_{i,g,s} x_{i,g,s} + e_{i,g,s} \quad (2)$$

where  $x_{i,g,s}$  are the determinants of match performance defined in the previous section and  $\theta_{i,g,s}$  their associated parameters.

The focus parameter in model (2) is  $\beta$ , which is a weighted average of the individual *ATEs* in expression (2). However, some of the weights could be negative when the *ATEs* are heterogeneous across groups and seasons. This is a fundamental concern as, for example, the linear regression estimand may be negative while all the individual treatment effects are positive. Thus, we use the decomposition of treatment effects proposed by de Chaisemartin and D'Haultfoeuille (2020) to evaluate the presence of negative weights and their total importance in the TWFE estimation using the `TwoWayFEWeights` package in Stata.

Moreover, to avoid the problem of negative weights discussed in the previous paragraph, we employ the estimation approach described in de Chaisemartin and D'Haultfoeuille (2020). Their estimation relies on the existence of stable groups, i.e., clubs that stay and do not stay in the Euroleague for two consecutive seasons. Thus, we estimate two difference-in-difference (DID) models for every group and every pair of seasons. The first one compares the performance change of a “joiner” (i.e. a new club in the Euroleague) with those not treated in any of the two seasons. The second DID model confronts the average change in performance of a “leaver” (i.e. a club that leaves the Euroleague) with those that were in the Euroleague for two consecutive seasons. Then, following de Chaisemartin and D'Haultfoeuille (2020), we aggregate all the DID estimates across groups and seasons using positive weights representing the proportion that the corresponding cell accounts for in the population of treated observations. We also performed this estimation employing the covariates defined in the data section ( $x_{i,g,s}$ ) to account for other predictors of match performance (de Chaisemartin and D'Haultfoeuille, 2022).

## 6. Empirical analysis

We start the analysis estimating the impact of Euroleague participation on domestic league performance using a TWFE model as described in expression (2). Table 2 shows the estimation results for two performance measures, score difference and victory for the total sample. Results indicate that home advantage and opponent's strength are important predictors of performance. In particular, controlling for other variables, playing at home increases expected score by more than 7 points, and the probability of victory by more than 20%. The results also show that indicators of an opponent's strength (especially Euroleague participation and percentage of victories in previous seasons) are important predictors of the two performance measures. Results also suggest a negative effect of Euroleague participation on domestic performance albeit it is not significant at the conventional levels. However, a non-significant aggregate treatment effect could mask significant disaggregate results.

Although an analysis by country is not possible because it requires a sufficient number of joining and leaving teams each season within each league, we define an intermediate disaggregation level. Thus, as discussed in the introduction, we broke down the sample into two groups (big and small leagues) according to the presence of teams that participate in the Euroleague Final Four during the period of analysis. There are stronger teams in big leagues than in small leagues and therefore it is plausible to assume that the former requires a higher amount of resources and effort to succeed.

From Table 2, the separate estimation for each group of leagues indicate that Euroleague participation consistently and significantly worsens performance in big leagues, with an expected reduction of about 2.5 points in expected score difference and 10% in the winning probability. However, the treatment impact on small leagues is positive and non-significant. A



plausible explanation for this contrast is that participation in the Euroleague allows clubs to get access to more financial resources. This increases the quantity and quality of the players. However, it also raises the number of games, potentially generating fatigue and dispersion of attention. In principle, we should expect this negative effect to be more prominent in big leagues where teams must face other strong rivals more often.

**Table 2.** Impact of Euroleague participation on match performance at the national league. TWFE estimation.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Score_difference						Victory					
	Total sample		Big leagues		Small leagues		Total sample		Big leagues		Small leagues	
treated	-0.062	-1.078	-1.750**	-2.445**	1.686	0.567	-0.019	-0.046*	-0.079**	-0.096***	0.043	0.011
	(-0.07)	(-1.56)	(-3.63)	(-3.42)	(1.59)	(0.71)	(-0.68)	(-2.21)	(-5.20)	(-6.85)	(1.85)	(0.51)
home		7.298***		7.010***		7.547***		0.221***		0.207***		0.233**
		(17.09)		(8.20)		(20.23)		(17.10)		(9.87)		(13.07)
%Team victories in previous season		0.024		0.011		0.029		0.000		-0.001		0.000
		(1.41)		(0.65)		(1.31)		(0.19)		(-1.44)		(0.66)
%Opponent victories in previous season		-		-0.226***		-0.192***		-0.006***		-0.006***		-
		0.209***		(-12.83)		(-17.21)		(-18.55)		(-9.25)		0.005**
		(-23.71)										* (-16.46)
team last Euroleague champion		2.163		2.472		0.000		0.024		0.037		0.000
		(1.55)		(1.60)		(0.00)		(0.64)		(0.84)		(0.00)
opponent last Euroleague champion		-3.922**		-2.822		0.000		-0.072*		-0.055		0.000
		(-2.44)		(-1.54)		(0.00)		(-2.24)		(-1.55)		(0.00)
team last Euroleague finalist		1.060		1.272		0.000		0.022		0.032		0.000
		(0.47)		(0.42)		(0.00)		(0.35)		(0.49)		(0.00)
opponent last Euroleague finalist		-1.841		-0.910		0.000		-0.061		-0.048		0.000
		(-0.89)		(-0.38)		(0.00)		(-1.21)		(-0.79)		(0.00)

team last league champion		0.917 (1.21)		0.526 (0.79)		0.627 (0.52)		0.034** (2.52)		0.019 (1.13)		0.024 (0.84)
opponent last league champion		-0.630 (-0.54)		-1.594 (-0.80)		0.073 (0.06)		-0.012 (-0.45)		-0.018 (-0.38)		-0.007 (-0.24)
team last league finalist		1.156** (3.36)		1.022 (0.84)		1.323* (2.40)		0.044** (2.45)		0.040 (0.94)		0.048* (2.66)
opponent last league finalist		-1.183** (-3.05)		-1.193 (-1.08)		-1.426 (-1.90)		-0.044*** (-4.01)		-0.033 (-0.95)		-0.056* (-2.44)
EuroLeagueParticipantOppo		-3.320*** (-7.57)		-2.802** (-3.85)		-3.599** (-4.14)		-0.080*** (-8.04)		-0.070** (-3.87)		-0.085** (-3.62)
Constant	0.009 (0.07)	6.739*** (6.20)	0.383*** (5.95)	9.140*** (18.90)	-0.133 (-1.51)	4.996** (3.30)	0.503*** (135.32)	0.703*** (19.27)	0.517*** (250.36)	0.797*** (31.28)	0.497** (299.18)	0.640** (14.83)
#Obs.	24480	24480	11324	11324	13156	13156	24480	24480	11324	11324	13156	13156
Squared R	0.159	0.316	0.202	0.385	0.117	0.249	0.109	0.223	0.145	0.281	0.078	0.175

t statistics in parentheses

\* p<0.1 \*\* p<0.05 \*\*\* p<0.01

However, as discussed in Section 5, compared to the TWFE estimates, the CD approach provides a more reliable assessment of the impact of Euroleague participation. This is especially true when the impact of treatment is heterogeneous across time and groups. In our setting the impact of negative weights is relatively low. In particular, using the decomposition of weights proposed by de Chaisemartin and D'Haultfoeuille (2020), for the big leagues, the TWFE model estimates a weighted sum of 97 ATTs, of which 68 are positive and 29 negative. The sum of positive and negative weights are equal to 1.04 and -0.04 respectively. A similar analysis for the small leagues shows that the TWFE model estimates a weighted sum of 37 ATTs, of which 30 receive a positive weight and 7 receive a negative weight. In this group, the sum of positive and negative weights are equal to 1.010 and -0.010 respectively.

Despite the results reported in the previous paragraph, the CD approach should be preferred even if the weights assigned to each ATE in the TWFE estimates are all positive. This is because, under the TWFE method, weights differ from the proportion that the corresponding cell accounts for in the population of treated observations (de Chaisemartin & D'Haultfoeuille, 2020). Table 3 shows the causal effect of Euroleague participation under the CD approach. Consistently with the TWFE results, Euroleague participation does not have a significant impact at the conventional levels on domestic league performance for the total sample and small leagues. However, we find a negative treatment impact on performance in big leagues (a reduction of about 2.3 points and 9% in the probability of winning).

To test for pre-trend we employ the method proposed by de Chaisemartin & D'Haultfoeuille (2020) which is valid for heterogeneous treatments. More specifically, we estimate a placebo test that compares treated and control match outcomes one season before treatment took

place. This type of tests is relevant in the cases where Euroleague participation had a significant effect on performance for big league, to look at whether treatment appears to have an impact on the outcome before it occurs. Thus, in cases with significant treatments all placebos are insignificant at the conventional levels with the sole exception of the conditional model for victory in the big leagues. However, in such a case we don't observe an anticipation of the negative effect for big leagues but a significant positive performance in the season preceding participation in the Euroleague that is reversed in the subsequent season.

**Table 3.** *Impact of Euroleague participation on match performance at the national league.*

*CD approach*

	<b>Score difference</b>					
	Total		Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional	Unconditional	Conditional
Treatment	-0.972 (-1.517)	-0.660 (-0.440)	-1.820** (-2.224)	-1.605 (-1.097)	-0.110 (-0.066)	-1.451 (-0.023)
Placebo	0.996 (1.154)	1.571** (2.003)	0.089 (0.065)	0.713 (0.534)	0.454 (0.183)	0.297 (0.239)
	<b>Victory</b>					
	Total		Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional	Unconditional	Conditional
Treatment	-0.055** (-2.638)	-0.047 (-1.274)	-0.102*** (-3.921)	-0.091** (-2.012)	0.010 (0.296)	-0.006 (-0.006)
Placebo	0.077*** (3.114)	0.102*** (4.335)	0.040 (0.968)	0.075** (1.983)	0.057 (1.284)	0.049 (1.337)

t statistics in parentheses

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Notes: Unconditional and conditional estimates refer to models without and with covariates respectively.

## 7. Transmission channel

Estimation results in the previous section clearly show that Euroleague participation negatively impacts performance (measured in terms of scores differences and probability of victory) in big national leagues. However, its impact on small leagues is not significantly

different from zero. In principle, it is difficult to interpret this negative effect in big national leagues as participation in an elite tournament facilitates access to more financial resources that can increase the gap between big and small teams at the national level. However, this seemingly strange result could be explained because participation in more competitions could also imply more fatigue and lack of focus on domestic competitions. To test this hypothesis, we estimate the impact of Euroleague participation on the aggregate number of resting days (days without any match) before and after each domestic league game. Table 4 shows the results of such estimation under a TWFE and CD modelling approach. Euroleague participation significantly reduces the number of resting days between matches by around 1.6 and 0.7 days in big and small leagues respectively.

**Table 4.** *Impact of Euroleague participation on the number of resting days. TWFE and CD approach*

	Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional
TWFE	-1.575*** (-6.41)	-1.623** (-5.59)	-0.693** (-3.71)	-0.762** (-3.73)
CD	-1.660*** (-11.493)	-1.731*** (-5.245)	-0.687*** (-2.872)	-0.180 (-0.026)
Placebo	-0.234 (-0.835)	-0.085 (-0.437)	0.099 (0.190)	-0.002 (-0.008)

t statistics in parentheses

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Notes: Unconditional and conditional estimates refer to models without and with covariates respectively.

Another relevant question to understand the transmission of Euroleague participation on domestic performance is to differentiate between the effect for joiners and leavers to the Euroleague competition. Thus, the first case compares new participating teams with teams that did not participate in two consecutive seasons. The second case compares teams that leave the Euroleague with teams that remain for two consecutive seasons (de Chaisemartin

and D'Haultfoeuille, 2020, Theorem 3). Table 5 shows the performance effect of Euroleague participation for joiners and leavers. The results indicate that the cost in terms of victories in the domestic league by newcomers is not offset by a performance improvement the year they leave. In particular, it can be seen that only joiners in big leagues significantly suffer the burden of taking part in the Euroleague while no consistent effect is observed for leavers. This suggest that the main burden of participating in the Euroleague occurs in the first year when clubs still do not have the necessary resources to deal with the increasing number of matches.

**Table 5.** *Impact of joining and leaving the Euroleague on match performance at the national league. CD approach*

	Score_difference			
	Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional
Joiners	-2.726*** (-3.351)	-2.530* (-1.815)	1.101 (0.594)	3.021 (1.252)
Placebo	0.019 (0.011)	0.811 (0.472)	0.125 (0.070)	1.002 (0.588)
Leavers	-1.002 (-0.947)	-0.768 (-0.320)	-1.141 (-0.574)	-5.259 (-0.047)
Placebo	0.253 (0.103)	0.482 (0.215)	0.684 (0.136)	-0.194 (-0.200)
	Victory			
	Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional
Joiners	-0.144*** (-5.340)	-0.139*** (-3.216)	0.024 (0.560)	0.073 (1.284)
Placebo	0.034 (0.701)	0.073 (1.387)	0.065 (1.144)	0.095* (1.814)
Leavers	-0.063** (-1.998)	-0.049 (-0.546)	-0.003 (-0.052)	-0.073 (-0.040)
Placebo	0.054 (0.638)	0.082 (1.551)	0.052 (0.774)	0.017 (0.789)

t statistics in parentheses

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Notes: Unconditional and conditional estimates refer to models without and with covariates respectively.

## 8. Betting market reactions

A relevant question regarding the impact of Euroleague participation on performance is whether this information is also shared by bookmakers. We assess the efficiency in betting markets by the extent to which the odds reflect the true probabilities of match outcomes. In a different setting, a recent contribution by Feddersen *et al.* (2021) found that bookmakers react to variation of team incentives of Champions League and Europa League football games. However, unlike team incentives, it is unclear whether bookmakers and bettors are well-informed about the impact of Euroleague participation on national leagues. To test this idea, we collected data from the sports data and betting site Betexplorer.com. We compared the odds for wins from these matches with other betting sites. Generally, the odds across these different betting sites were very similar. As is the case, the probabilities for a home and an away win derived directly from the odds sum to more than 1. This excess or overround accounts for the bookmakers expected profit. So that the probabilities sum to one, we compute adjusted or implied probabilities with the overround proportioned across the two outcomes (Forrest and Simmons, 2002).

Table 6 shows the impact of Euroleague participation on the implied winning probabilities from the betting market. Results suggest that betting markets are over optimistic about the total effect of Euroleague participation. In fact, they expect no impact in big leagues and an increase in winning probability of around 10% in small leagues, although this last result is not robust across all the specifications. These results suggest that the negative impact on performance associated with participating in more tournaments are not fully understood.



**Table 6.** *Impact of Euroleague participation on the probability of winning from the betting markets. TWFE and CD approach*

	Big leagues		Small leagues	
	Unconditional	Conditional	Unconditional	Conditional
TWFE	0.021*** (7.42)	-0.027 (-1.48)	0.154** (5.11)	0.073** (4.16)
CD	0.006 (0.250)	-0.004 (-0.055)	0.119*** (3.406)	0.105 (0.063)
Placebo	0.041 (0.839)	0.051 (1.546)	0.073 (1.019)	0.058 (0.860)

t statistics in parentheses

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Notes: Unconditional and conditional estimates refer to models without and with covariates respectively.

## 9. Discussion and concluding remarks

We study the impact of participating in the Euroleague on match performance in the national leagues of eight European countries. We found that, in big leagues, Euroleague membership significantly worsens performance with an expected reduction of about 2.5 points in score difference in a match and 8% in the winning probability. However, no significant impact was observed for small leagues. A possible channel of transmission of the estimated effect is the expected reduction of resting days: 1.6 and 0.7 in big and small leagues respectively. However, the harming effect is only observed for the joining teams but not for the leaving teams. Despite its significance, the worsening performance in big leagues is not well predicted by bookmakers. This suggests that the final effect is complex and therefore difficult to understand by bookmakers and bettors.

The present study may shed light on the debate over whether a closed or semi-closed tournament played by top European clubs would harm (or even kill) national domestic leagues. Our analysis suggests that, in leagues with a crowded schedule, Euroleague

participation would harm domestic league performance (at least for some of the clubs), contributing to increasing the competitive balance of the league. Thus, more modest clubs with more time to prepare for the match could find an opportunity to beat one of the glamorous Euroleague participants. However, Euroleague teams in small leagues did not suffer significant consequences in terms of results, which could diminish the interest for these competitions relative to big leagues.

We can think about two political actions to safeguard the interest of domestic competitions in the presence of a superleague. First, using Euroleague revenues to help smaller clubs. Moreover, as happened in the Euroleague during the analysis period, there were a number of spots to be allocated to smaller teams based on their sporting performance. However, this is no longer the current policy stance as clubs cannot access the Euroleague from their performance in domestic leagues from the 2019/20 season.

Second, some small leagues that are geographically close could merge to become stronger tournaments. This happened, for example, with the Baltic league, which saw the merger of the leagues of the Baltic states but also included the participation of teams from Sweden, Russia, Kazakhstan, Finland and Belarus. A similar idea could increase interest in leagues in bigger countries where there is less tradition in basketball, such as the UK and most Nordic countries.

It is likely that in the coming years we will observe new proposals to create closed international competitions that ensure the presence of top teams to fans and sponsors for other sports. Many of them will imply to break with organisers and could affect the interest of

different stakeholders. We hope the present paper will incentivise research that sheds more light about the effects of these initiatives.

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