Sport Economics

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Introduction

All papers considered in this section of the digest come from published issues in the first six months of 2022 from the ten pre-selected journals. Of these ten journals, two are exclusively dedicated to sport economics related research, the *Journal of Sports Economics* (JSE), which is the official Journal of the *North American Association of Sports Economists* (NAASE) and the *International Journal of Sport Finance* (IJSF), which is the official journal of the *European Sport Economics Association* (ESEA). Furthermore, sport economics research is regularly published in either of the three sport management journals, i.e., the *European Sport Management Quarterly* (ESMQ), the *Journal of Sport Management* (JSM), the *Sport Management Review* (SMR) and the *Journal of Global Sport Management* (JGSM). The following list provides a summary of overall 42 identified papers covering sport economics related research that have been published in either of these six journals as of June 2022:

JSE (Issues 1-5): 25 papers, with each of the 25 covering sport economics related research,

IJSF (Issues 1 & 2): 8 papers, with each of the 8 covering sport economics related research,

ESMQ (Issues 1-3): 23 papers, with 2 covering sport economics related research,

JSM (Issues 1,2, & 3): 26 papers, with 4 covering sport economics related research,

SMR (Issue 1 &2): 14 papers, 0 covering sport economics related research,

JGSM (Issue 1 &2): 16 papers with 1 covering sport economics related research.

The forty papers fall into seven different categories:

Labor markets (such as league restrictions on player mobility; player and coach hiring, dismissal and contracts, performance and incentives; transfer markets; salary determinants; discrimination): 11,

Performance Analysis (such as home advantage, tournament effects, and behavioral sport economics such as the effect of travel, home field, etc. on performance): 7,

Demand for Sport (the determinants of stadium attendance, TV viewing): 7,

Mega Event Analysis (such impact of large sport events— i.e., Olympics, Super Bowl, World Cup— on communities and regions): 6,

Sport and Vice (financial analysis of sports gambling markets, effects of law and policy on sports wagering, doping and sport outcomes): 4,

Amateur Sports (USA College sports and other amateur sports): 3

Finance & Ownership (such as the financial returns to investment sport, sport and financial markets):

New perspectives on labor markets and performance in sport

For this edition of the Digest, I've reviewed empirical studies exploring labor market and performance issues in sport. Labor market analyses are long a staple of sport economics research and the initial volumes of 2022 have seen a substantial amount of traditional sport labor market research. Indeed, the *JSE* contains nine of the eleven labor market publications, most of those on traditional labor issues such as pay and performance, wage dispersion, and labor market discrimination. Although much prior research has examined American major league sports and European football, in this year's publications, we continue to see an extension of research across sports and countries. Two JSE articles (one a reply) address pay and performance among UFC fighters (Gift, 2022 and Caves, Tatos, &Urschel, 2022) and another a discrimination in the Chinese basketball league (Berri, Budekin, & Deutscher). Performance studies are now more often associated with behavioral economics. For example, reference points as principal to decision making regarding gains and losses, rather than absolute utility. Sport offers data-rich opportunities to test these theories.

In many instances, labor market research and studies of performance analysis overlap as performance largely determines compensation and contractual outcomes. For example, the shirking literature in sports economics, e.g., Maxcy, Fort and Krautmann (2002) would generally be considered a labor market application, but performance analysis and psychology also underlies this research. There are likely to be behavioral effects influencing an athlete's willingness to supply effort that are not fully addressed in the early shirking literature. New perspectives on performance have developed in recent years with the influence of innovative behavioral economics on the sports economics literature. Additionally, behavioral applications best categorized as performance analysis is covered in several papers published already in

2022. Included are performance under pressure in team handball (Bühren and Träger, 2022), the effects of a sophomore slump in EPL soccer (Kim, Kim, and Kang, 2022), the effects of more running on the behavior of football referees (Wicker et al, 2022), and refence points in auto racing (Yaskewich, 2022). There is also a paper on external factors like air pollution that may affect performance (Qin, Wu, & Zhang, 2022).

For the balance of this article, I'll discuss four important papers in more detail. A topic of garnering great attention in sport management and labor markets is discrimination. Sports labor markets have provided a very useful ground for testing for evidence discrimination. Notwithstanding, discussion and research on discrimination in sport are hardly limited to economic analysis. In fact, several 2022 JSM articles have addressed gender and race-based discrimination in sport management institutions from non-economic perspectives (e.g., Singer, et al. 2022 and Sveinson, et al. 2022).

The first paper deals with discrimination in sport labor markets. Research on racial discrimination in professional basketball has drawn attention since the well-cited paper of Kahn and Sherer (1988) finding that despite over-representation on rosters, black players were under paid by about 20% relative to similarly productive white players. Moreover, the source of the discrimination was determined to be customers rather than owners, as discrimination was most prominent in the demographically whitest cities. That topic is revisited in and econometric analysis of the Chinese Basketball Association (CBA) by Berri, Budekin, & Deutscher in the *JSE's* February 2022 edition. This study likewise provides some unanticipated results. Prior studies on the CBA have examined competitive balance, but none has previously investigated whether or not xenophilia, implied by existing studies of European Soccer (i.e., the English Premier League and Spanish Liga), extends to professional basketball in China.

Using data from the Chinese Basketball Association the authors examine the factors that determine a player's playing time, looking in particular at the national origins of players. The CBA is the preeminent basketball league in Asia, and its current form began in 2005-2006. The league has enjoyed a steady rise in attendance and TV viewership in recent years. The question remains as to the degree to which this growth is because of foreign player participation in the league. There are a number of prominent American basketball players who have participated in the and starred in the CBA, including Stephon Marbury and Jimmer Fredette.

As expected, playing time in the CBA is explained by the standard performance variables as and personal characteristics like age and height. However, when the authors tested for evidence of privileged treatment for foreign players, their findings offered reliable support for

discrimination in favor of U.S. players and other foreign nationals. Non-Chinese players receive significantly more minutes per game after controlling for performance and individual characteristics. This is true whether U.S.-born foreign players or players from other countries. However, there are a relatively small number of non-U.S. foreign players in the data sample.

Moreover, the Chinese coaches are found to have discriminated against the Chinese players more than non-Chinese coaches. As with the Kahn and Sherer findings it argued that likely that it is fan demand to see American players — the customer as the source of discrimination— which drives this playing time disparities. The bias uncovered appears to reflect the preferences of the Chinese customers.

The second paper by Wicker, Orlowski, and Weimar in the January 2022 *IJSF* also has an aspect of testing for discrimination. The study considers the possibility of referee bias when issuing penalty (red and yellow) cards in football. Referee behavior has been considered in several prior studies. Nevertheless, most of these offered the workings of referee behavior on the determination of outcomes. For example, prior studies on referee behavior in professional football, have focused on home advantage and social pressure of the crowd, largely neglecting other factors which may be accountable to referee behavior. As with the first paper, discrimination is hypothesized here to be important in referee decisions. Previous research has explained biased their decisions are linked to inherent time pressure, as referees have to make decisions within a few seconds. The role of national identity between the referee and players has been emphasized.

This study finds that teams that run farther and more intensely during a match are given fewer penalty cards by referees, all else constant. It's theorized that intensive player running causes more time pressure for referees as they may be poorly positioned on the field to see the situation they have to evaluate and thus make a quick but less-informed decision opening the door for biased decision-making.

The empirical analysis uses data from the German Bundesliga over a eight year period (2011–2018). The regression analyses show that a greater running distance covered by teams is correlated with significantly fewer yellow, yellow-red, and red penalty cards. Moreover, higher the number of intense runs, is also positively associated with fewer yellow-red and red cards. Interestingly the referees also receive significantly better performance grades from teams that have covered more distance in the match. Collectively, these findings suggest that not only referees make biased decisions but that the evaluation of their performance is also subject to biases. The last point seizes attention because it suggests that referees are responding to incentives for their own better grades by rewarding teams more likely to grade them better.

The findings have implications for referee development and coaching. Physical and cognitive abilities are already considered in referee training, yet the results of this study suggest that both the total distance covered by players on the field and the distance covered at higher intensity have measurable effects on referees' behavior. The authors suggest that instructors responsible for referee development should reconsider the design and focus of referee training.

The third paper by Yaskewich, and also the *IJSF* January edition, is likewise a behavioral economics application. The paper covers the rarely studied sport of professional drag (automobile) racing. The hypothesis is that a driver's performance is altered when facing off against a competitor of very similar rank, or current status. The National Hot Rod Association (NHRA) tournaments are organized as a series one-on-one of races. The author contends drag racing is very useful for behavioral analyses because unlike other forms of auto races, there is no intrusion between the competitors during a drag race. This creates clean measures of absolute and relative performance. Drag racing data incorporates very distinct measures of performance, including both reaction and elapsed times. A unique feature of drag racing is an element of outcome uncertainty introduced by reaction time performance. Drivers with slower vehicles might need more time to travel the distance of a drag strip yet a faster reaction to the lighting signal that officially starts a race helps them compete with faster vehicles. The author analyzed pairs of higher- and lower-ranked drivers in cases where ranking differences were both large and small. The analyses used a panel of data collected over 10 years (2010-2019). The final empirical results showed that closeness in drivers' rank improved the absolute performance, the reaction times of the higher-ranked driver. However, this effect was only statistically discernable when closely ranked rivals were paired together. The main results of the paper suggest that the presence of a status rival actually improve a competitor's absolute performance. In an analysis of the NHRA tournaments, higher-ranked drivers were found to have improved reaction times when paired with a lower-ranked status rival. A second notable result was there was no evidence of "choking" under pressure in most outcomes. The author explains that these results differ from studies on other sports, and he offers reasons as to why professional drag racers might be less susceptible to choking. Vehicle quality is an essential component of success and involves much effort from a driver's crew members, so disparities in quality minimize choking under pressure. However further investigation is needed to develop a better understanding of why performances in some competitive environments are more vulnerable to psychological stress.

The final paper by Qin, Wu, & Zhang (2022), was published in the May edition of the *JSE*, and considers impact of air pollution on Chinese professional football players' performance. Are sports players, with high level professional skills, affected air pollution and thus have

productivity losses during games? Prior studies have shown athltes can adapt to some unfavorable external conditions like high temperature. But this study is unique in addressing the problem of air pollution. The paper addresses the emerging literature studying the impact of air pollution on sports outcomes. It also documents a consequence that air pollution may amplify the home advantage in sports contests. Their secondary question is one of adaptability and that there may be both physical and behavioral aspects of adaptation to pollution. Can the negative effects of air pollution can be mitigated by adaptation, and what types players are more suited to adapt to the pollution?

Empirical evidence from professional football players in China is used to analyze these questions. A typical professional football player participates in routine training in his home city but participates in football games in many other cities. The empirics here evaluate the disparity between the home and away game-day air pollution for each player in all games, which enabled the authors to identify the effects of adaptation and test whether home advantages exist in terms of air-pollution adaptability. The data used covered all football games held from the 2015 – 2017 seasons a total of 576 games on 210 game days in 16 different cities. Air pollution was measured using hourly data from 163 national monitoring stations during those seasons, in the 16 cities from May 2014 and December 2017.

Their results suggest that football players' performance is negatively affected by air pollution. However, the negative effects of air pollution can be mitigated if the player has been able to adapt to the pollution. A higher pollution level during the game, relative to the adapted pollution level in players' home cities, has a negative and significant impact on the players' efforts and accuracy. The impact of non-adapted air pollution can be greatly offset by the home advantage, but not by personal attributes such as higher ability. The important take away from the findings is that they call for the improvement of air quality from the context of sports. Air pollution reduces performance for almost all types of football players, including less passing and lower shot accuracy, all of which decrease the quality of the game for the audience. They also suggest the results show the importance of psychological adaptation. Mitigation the potential negative impact of air pollution, may be to make players feel like "home-team players".

Conclusions

This review covered labor issues in sport and specifically issues related to a performance by athletes and referees, and how outcomes may be affected. The paper by Berri et al addressed the long-studied issue of discrimination in sports but within a new setting of basketball in

China. Sports is proving to be a rich area for empirical research on behavioral economics as shown by the papers of Wicker et al and Yaskewich. Finally, as sustainability and environmental issues become more in the forefront the paper by Qin et al provides a nice application given its findings on the effect of air pollution on soccer players' performance. The initial review of sports economics research for the Digest covered new assessments about the existence or lack thereof of local economic effects of sports. This is likewise important, and we expect upcoming research in sport economics to include both of these areas and likely other topics including issues in league organization, the consumer demand for sport, and sport financial issues.

Annotated bibliography

Berri, D.J., Burdekin, R. and Deutscher, C. (2022) Nationality Effects on the Allocation of Playing Time in the Chinese Basketball Association: Xenophilia or Xenophobia? *Journal of Sports Economics.* 23 (2) (February). 156-174.

> This paper uses 2011–2019 data from the Chinese Basketball Association to assess the determinants of playing time with a focus on the effects of players' national origin. Playing time is explained by an array of standard performance variables as well as each player's characteristics (such as age, height, and weight). Controlling for these factors, we test for whether there is any evidence of preferential treatment for foreign players over Chinese players. Our findings, using both a fixed effects model and the Oaxaca–Blinder decomposition approach, offer consistent support for discrimination in favor of U.S. players and other foreign nationals. Intriguingly, Chinese coaches discriminate against Chinese players even more than non-Chinese coaches. We argue that foreign players draw attendance and hence receive more playing time than is justified by their performance alone.

Qin, Wu, & Zhang (2022) Can Professional Football Players Adapt to Air Pollution? Evidence From China. *Journal of Sports Economics*. 23(3) 277-300.

> In this paper, we study the impact of air pollution on Chinese professional football players' performance. Our primary research question is whether the negative effects of air pollution can be mitigated by adaptation, and which cohort of players can have higher adaptability. We find that a higher pollution level during the game, relative to the adapted pollution level in players' home cities, has a negative and significant impact on the players' efforts and accuracy. The impact of non-adapted air pollution can be greatly offset by the home advantage, but not by personal attributes such as the higher ability.

Wicker, P. Orlowski, J. and Weimar, D. (2022) Referees' Card-Awarding Behavior and Performance Evaluation in Professional Football: The Role of Teams' Running Distance and Speed. *International Journal of Sport Finance*, 17, (1) 62–72.

> This study examines the effect of football teams' distance covered and number of intensive runs (>20 km/h) on referees' card-awarding behavior and their performance evaluation. The empirical analysis uses data from the German Bundesliga (2011–2018), yielding a final sample of n = 2,130 observations on a match-game day basis. Card-awarding behavior is measured with the number of yellow, yellow-red, and red cards awarded. Performance evaluation is captured by Kicker grades. The regression analyses show that greater distance covered by teams is associated with significantly fewer yellow, yellow-red, and red cards and significantly better grades for referees. The higher the number of intensive runs, the fewer yellow-red and red cards are awarded. Referees receive significantly better grades when teams have covered more distance in the match. Collectively, these findings suggest that not only referees make biased decisions but that the evaluation of their performance is also subject to biases.

Yaskewich, D. M. (2022) Reacting to Status Threat? Rank Proximity and Performance in Professional Drag Racing. *International Journal of Sport Finance*. 17, (2) (May 2022) 107-122.

> This paper used data from professional drag racing to study how proximity to another competitor in a status ranking affected performance. The one-on-one format of races in National Hot Rod Association (NHRA) tournaments provided a setting to analyze pairs of higher- and lower-ranked drivers when status differentials were either large or small. Based on panel data from the 2009 through 2019 seasons of the NHRA's Top Fuel and Funny Car divisions, results indicated that rank proximity improved absolute performance on reaction times by higher-ranked drivers. However, this effect only occurred when contiguously ranked opponents were paired together. Lower-ranked drivers, or underdogs, did not experience any improvements in absolute performance due to rank proximity. In the main findings, I observed that a threat of status loss can motivate performance for a focal competitor, but this effect primarily occurred when a status rival was physically present during a task.

Further References

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