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Mike Troilo
University of Tulsa, mike-troilo@utulsa.edu

Adrien Bouchet
University of Tulsa

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Professional Sports Organizations and Business Analytics: Monopoly Power vs Debt Financing

Mike Troilo
University of Tulsa
Adrien Bouchet
University of Tulsa
Please send correspondence to: Mike Troilo, mike-troilo@utulsa.edu

The use of analytics in professional sports organizations (hereafter "PSOs") is now widely diffused, yet historically, sports organizations are slow to adopt new technology and practices for their business operations. A salient example is variable or market-based pricing, otherwise known as dynamic pricing. In the late 1970s, the airline industry was the pioneer of this technique, adjusting the prices of airfare instantaneously in response to supply and demand. The hotel and car rental industries followed in short order. For many professional sports franchises, however, dynamic pricing first appeared in the 2010s (Troilo, et al. 2016). Why is it that PSOs are such laggards? Is there any way that PSOs can become proactive with regard to adopting best practices in analytics, or are they fated to be one step behind organizations in other industries due to their circumstances? Do early adapters of analytics for on-the-field usage also adopt analytics ahead of other PSOs to drive results on the business side of the organization?

In this essay, we consider the factors that explain the reticence of PSOs to be early adopters of analytics. We examine the relatively privileged position that professional sports franchises at the highest echelon in the U.S. and Canada enjoy and compare it the industry dynamics firms face in competitive environments. We remark upon the expansion of the league via debt financing, and why that promotes increased use of analytics. We also offer several propositions about the growth of analytics, and we conclude with some thoughts about what the future may hold for PSOs and analytics.

What are "Analytics"?

The terms "analytics", "sports analytics", and "business analytics" are popular currency, but what do they mean? Per the Oxford dictionary, analytics are "the systematic computational analysis of data or statistics." According to IndiaMag, sports analytics consist of both on-the-field and off-the-field analytics. On-the-field analytics study players' performance, opponents' tendencies, and game strategy; the "Sabermetrics" of Bill James (1977) and *Moneyball* (2003) exemplify these characteristics. Off-the-field analyt-

ics seek to maximize business revenue by examining fan engagement, ticket churn/pricing, merchandise sales, and media usage, particularly TV broadcasting and social media.

For our purposes, we identify analytics with this latter, off-the-field variety. We associate it with the academic work of Davenport and Kim, who defined (business) analytics as, “the extensive use of data, statistical and quantitative analysis, explanatory and predictive models, and fact-based management to drive decisions and add value” (Davenport & Kim, 2013, p.3). While the use of on-the-field analytics is pervasive at both the professional and even collegiate levels, the prevalence of off-the-field analytics is lacking. Henceforth, our use of analytics means off-the-field or business analytics. We are weighing how PSOs employ business analytics to increase metrics such as revenue, profits, and cash flow in the context of rising PSO valuations and debt loads.

One is a Lonely Number: The Downside of Monopolies

If a person were to study the major markets of the four largest professional sports leagues in U.S. and Canada[1], he or she would be struck by the fact that the franchises in those leagues usually have an entire metropolitan area to themselves. That is to say that for any given city, there is typically only one team in American football, basketball, baseball, or hockey. In the three largest urban centers (New York City, Los Angeles, and Chicago), there are duopolies, such as the New York Giants and New York Jets in American football, and the Chicago White Sox and Chicago Cubs in baseball, but these examples only underscore their rarity. Outside of these top three population centers, monopoly is the general rule. Cities as large as Houston, Boston, Philadelphia, and Washington D.C. have just one team apiece in the four professional leagues.

Note that these monopolies are by fiat rather than natural monopolies that may have a competitive fringe in the market. This distinction means that there are insurmountable barriers to entry for potential rivals in the four major North American professional sports leagues. For example, Philadelphia has one NBA franchise, the 76ers. There is no way for a second NBA franchise to operate in Philadelphia unless the NBA allows it. Anyone with an idea of competing at the highest level of men’s basketball in Philadelphia (and other cities) would have to invent a new league with its own set of franchises. This is similar to what happened in American football, where leagues such as the United States Football League (USFL) and Arena League were founded to rival the NFL.

According to Arrow (1962), secure monopolists (the PSOs) gain less from process innovations than do firms in competitive markets/industries. This suggests that PSOs have no incentive to adopt technology such as analytics, yet it is clear that they do (Bouchet, et al., 2020). There is a countervailing trend of increased spending and debt among PSOs; this necessitates their use of analytics.

[1]The four largest sports in North America as measured by both total revenue and fan attendance are: 1) American football, as represented by the National Football League (NFL), 2) Basketball, as represented by the National Basketball Association (NBA), 3) Baseball, as represented by Major League Baseball (MLB), and 4) hockey, as represented by the National Hockey League (NHL).

Sports' Spending Spree

The valuations of PSOs have been growing exponentially over the past few decades, and as a consequence, potential owners of PSOs require more debt financing in order to acquire them. Consider the descriptive statistics below (see Table 1) for the period 2011-2021 for the four major professional sports leagues in North America, measured in billions of U.S. dollars:

Table 1

Descriptive Statistics for the Four Major US Professional Sport Leagues

	Total value 2011	Total value 2021	Average value 2011	Average value 2021
NFL	33.2	111.5	1.0	3.5
MLB	15.7	57.2	0.5	1.9
NBA	11.1	66.1	0.4	2.2
NHL	6.8	20.2	0.2	0.7

Note: Authors' calculations from Rodney Fort Database Team Values (Forbes).

Simple growth in total value of all PSOs by league for the decade is 235% for the NFL, 264% for MLB, 496% for the NBA, and 197% for the NHL. The compound annual growth rates (CAGRs) are 12.9%, 13.8%, 19.5%, and 11.4%, respectively. The average value of a PSO in the NFL grew from $1 billion to $3.5 billion: an overall increase of 250% and a CAGR of 13.3%. For MLB, the increase is 280% from $0.5 billion to $1.9 billion at a CAGR of 14.3%. The NBA had the most growth in average PSO value from $0.4 billion to $2.2 billion: an overall increase of 450% at a CAGR of 18.6%. The NHL lags in terms of the absolute value of the average, as it is the only league where the average PSO value is below $1 billion. On the other hand, the overall increase and CAGR are identical to MLB at 250% and 13.3%, respectively.

Debt financing is the mechanism fueling the expansion. Using the NFL as an example, the debt levels for each PSO are unavailable, but the league as a whole is now carrying $10.5 billion in bonds, notes, and revolving credit (Dixon, 2021). Because of the value of TV rights, estimated at $110 billion for the eleven seasons encompassing 2023-2033 (Dixon), bankers are comfortable lending to NFL franchises due to the expected cash flows. With that being the case, however, the individual PSOs have to service their debt by making regular interest payments. This requires each franchise to maximize revenues (and hence, profits), thereby necessitating the use of analytics.

Four propositions About Analytics Growth

The tension around PSOs and analytics exists between their monopoly status, which disincentivizes adoption of process innovations such as analytics, and the need to maximize revenues/profits/cash flows to service the debt necessary for continued expansion. We advance four propositions about the drivers of analytics growth in professional sports.

The first considers the increasing valuations of PSOs evidenced above:

> P_1: The high valuations of PSOs spur potential and current owners to increase their debt holdings both to acquire and to operate teams.

Because of increased debt, owners are searching for new revenue streams. While typically the increase in revenue has been associated with media rights, other avenues to increase revenue are being explored. This encourages creativity regarding new combinations of offerings to fans and other stakeholders as a means of making money, hence the following proposition:

> P_2: The development of new revenue streams is driving novel relationships between PSOs and other industries that previously were viewed as unrelated to sports and entertainment.

Consider this example. Fifty years ago the St Louis Cardinals were a just a baseball team that played in Major League Baseball, representing their city as other franchises did. In 2014, the Cardinals opened Ballpark Village in partnership with The Cordish Companies, a real estate development firm. Ballpark Village is a dining and entertainment district located adjacent to the Busch stadium that is co-owned by both entities and has expanded to include both residential and commercial real estate, with luxury condominiums and office space (Rubbelke, 2021).

Today, teams are increasingly part of larger initiatives designed to increase revenue for the owners, and many of these initiatives involve real estate. Another example is how the Orlando Magic team in the National Basketball Association is looking to leverage its anchor tenant status to a $500 million dollar Sport & Entertainment District real estate development that surrounds the Amway arena (Lynch, 2022). These trends create a more complex business environment for PSOs, hence:

> P_3: Owners and executives are becoming more sophisticated regarding the business operations of professional sport organizations.

We mentioned *Moneyball* earlier. Prior to its publication, owners of PSOs would defer to general managers regarding business operations in the belief that professional sports were a different business from whichever business the owner had been successful. General managers themselves contributed to this mystique, and since these general managers themselves usually had decades of experience as players and/or coaches prior to becoming general managers, the owners felt that they did not have the knowledge to contradict the general manager.

Moneyball revealed that many of the skills necessary for successful business management, particularly the analysis of information and data, were also applicable to the operation of professional sports franchises. It suddenly became necessary for each PSO to have a C-suite replete with the usual ensemble of titles: CEO, COO, CFO, CMO, etc. These specialized executive roles matched the skills required to manage the daily operations of the franchise.

It makes sense that the diffusion of this trend did not occur evenly. PSOs that adopted the use of analytics in assisting the decision-making for on-the-filed success would likely be amenable to using those skills to improve the business side of the organization. In essence, the book (and movie) ushered a professional managerial class into PSOs; a coterie of people who were sharp with numbers and who would be at home at any Wall Street investment bank. This leads to our fourth and final proposition:

P_4: PSO that were early adapters of analytics for on-the-field usage should be amenable to using analytics to help drive revenue on the business side of the organization.

Final Thoughts

Regarding business analytics, PSOs in the four major North American leagues face countervailing dynamics. On the one hand, these PSOs exist mainly as monopolies (or else duopolies) in the metropolitan areas they represent and serve. This would tend to diminish the need for adoption of process innovations such as business analytics. On the other hand, PSO valuations are growing over time, and with them, the debt needed to service the acquisition of franchises.

One of the main drivers of valuation increase is the tendency of PSOs to partner with other firms, particularly in the area of real estate development, to offer new combinations of products and services to fans. This in turn has led to greater complexity in the business operations of PSOs, which necessitates the use of analytics both to make sense of the complexity as well as to improve the business metrics (revenue, profit, cash flow) needed to service larger debt loads.

Considering these trends, we conjecture that analytics is not only here to stay in the world of PSOs, but that the lag effect will not be as great as it was in the past. Because of the lack of competition, it is probably too much to expect PSOs to catch, let alone surpass, firms in competitive industries. On the other hand, PSOs will no longer be as far from the frontier. We mentioned at the outset how airlines and hospitality instituted dynamic pricing decades before professional sports. Given the pressures of servicing debt and satisfying fans faced with a plethora of options and distractions, PSOs can no longer afford the luxury of waiting so long to adopt the latest analytical methods. They need to stay more current than ever.

Four propositions encapsulating these thoughts were offered in this essay. We see the propositions as a guide to current developments regarding PSOs and analytics, and also as markers for future research. We intend for this "think piece" to be the start of an ongoing conversation about analytics and professional sports organizations.

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