Impact of Game Performance and Sponsorship Visibility on Fan Engagement

ANIKA TSE

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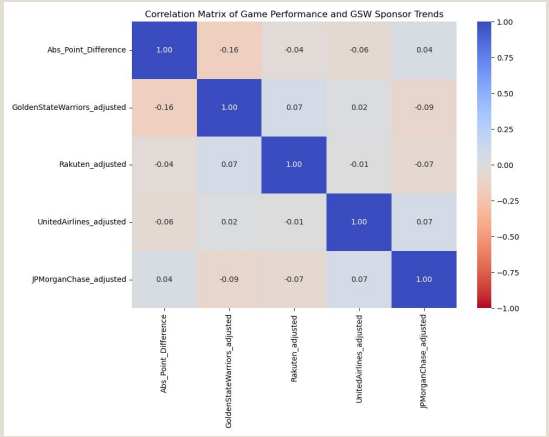
In professional sports leagues, many companies participate in team sponsorships to expand brand visibility and build deeper relationships with consumers. My final project examines if and how game-to-game performance and sponsorship visibility affects the engagement of sponsoring companies. I specifically take a closer look at the NBA team, the Golden State Warriors, and their major sponsors, Rakuten, United Airlines, and Chase over the 2021 to 2025 seasons.

DATA SOURCE	NAME | DESCRIPTION	TYPE	LIST OF FIELDS	FORMAT	DATA SIZE
1	Team Performance | GSW Seasons 2021-2025 Game Statistics	Web Page	Date, Opponent, Result, W-L, Hi-Points, Hi-Rebounds, Hi-Assists	HTML	406 (Games)
2	Sponsorship Visibility | GSW News Articles	API	Title, Date, Excerpt, URL, Author	JSON	842 (Articles)
3	Fan Engagement | Sponsor Daily Google Trends	API	Time, Interest over Time	CSV	1826 (Daily Trend per Sponsor)

Game Performance vs Sponsor Interest over Time

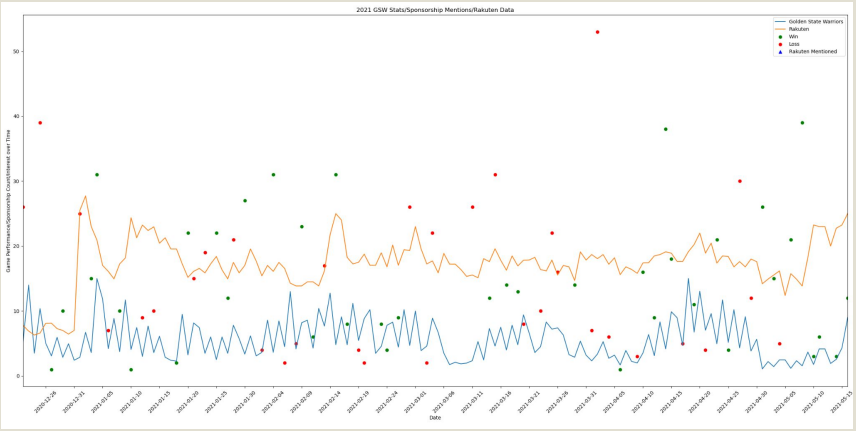


Methods of Analysis:

Line/Scatter Plots

Correlation Matrix

Linear Regression



Correlation Analysis: Across the entire 2021-2025 time frame and for each individual season, absolute point difference in games are very weakly correlated with Warriors and their major sponsors' trending interest over time.

Linear Regression: Fitting a linear regression model to the data, absolute point difference accounts for almost none of the variance within the data. Additionally, the coefficients return insignificant.

Time Lag Adjustment: To account for potential delay in the effect of game performance on trends, I measured correlation and fit a linear regression model using adjusted data, shifting trend values forward by one day. The data still returned weak relationships between game performance and sponsor trends.

```
All Data R Squared: 0.001
                            Test for Constraints
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
c0            18.9543      0.853     22.225      0.000      17.278      20.631
c1            -0.0387      0.053     -0.734      0.463      -0.142       0.065
==============================================================================
2021 Season R Squared: 0.002
                            Test for Constraints
==============================================================================
                 coef    std err          t      P>|t|      [0.025      0.975]
------------------------------------------------------------------------------
c0            17.8479      0.743     24.031      0.000      16.367      19.329
c1            -0.0151      0.040     -0.376      0.708      -0.095       0.065
==============================================================================
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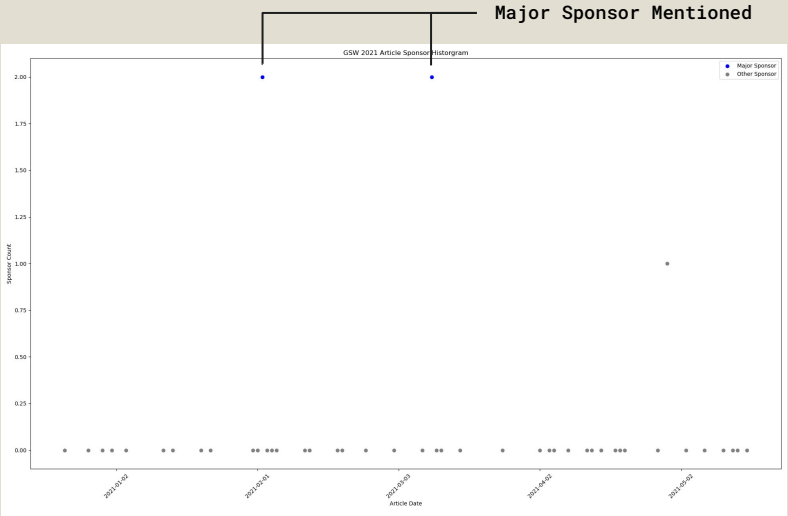
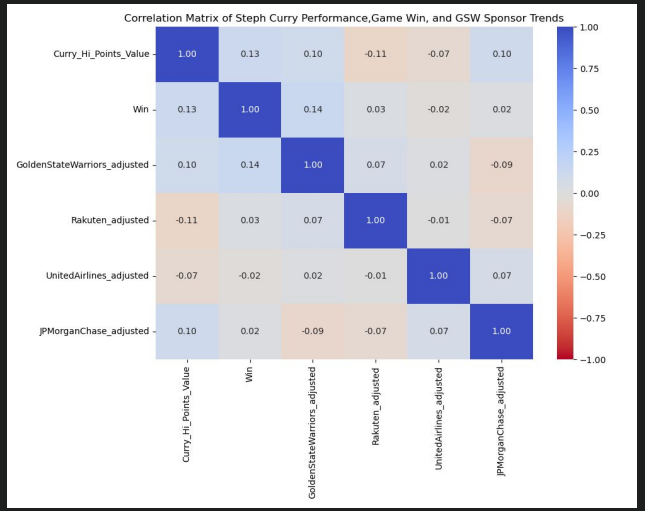
GSW Sponsorship Visibility vs Sponsor Interest over Time



Comparing sponsorship visibility on the Warriors' news website with major sponsor interest over time, my exploratory data analysis and regression modeling also returned weak correlation and insignificant results. It seems as though major sponsors are not consistently mentioned in articles to serve as a robust data source for this analysis.

For further analysis, I would like to evaluate major sponsor mentions in social media and visibility during game broadcasts(jersey sponsor, court/arena sponsor).

Stephen Curry Performance and Game Win vs Sponsor Interest over Time



Stephen Curry's performance and game wins have a stronger effect on major sponsor interest over time, however the correlation between performance and sponsor trends is still weak (<0.15) and coefficients are not significant in linear regression.

In this project, I only evaluated Curry's performance when he was the Warriors' top scorer. For further analysis, I would evaluate his game to game performance, including other statistics like assists, clutch performance, and +/-.

DOES GAME PERFORMANCE AFFECT TEAM DISCUSSION?

When fitting a linear regression model for the effect of Stephen Curry's performance, team win/loss, and absolute value point difference on the Warriors' interest over time, these parameters seem to account for a larger amount of variation (10-25%) within the data.

When reviewing trend data over the course of the 2021-2025 seasons, the coefficients for team win/loss (1.08116) and absolute point difference (-0.1128) are significant. Specifically, when the Warriors win, and when absolute point difference decreases (tighter game score), Warriors trending interest over time increases.

However, season by season, the significance of the parameters fluctuate and overall, Stephen Curry's scoring performance does not seem to have a significant influence on Warriors interest over time.

All Data R Squared: 0.065

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
c0	10.4883	1.510	6.947	0.000	7.513	13.464
c1	0.0271	0.043	0.636	0.526	−0.057	0.111
c2	1.8116	0.704	2.575	0.011	0.425	3.198
c3	−0.1128	0.037	−3.052	0.003	−0.186	−0.040

2022 Season R Squared: 0.103

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
c0	10.6557	4.212	2.530	0.016	2.113	19.198
c1	0.0632	0.120	0.525	0.603	−0.181	0.307
c2	4.2848	2.305	1.859	0.071	−0.389	8.959
c3	−0.0282	0.129	−0.220	0.827	−0.289	0.233

2025 Season R Squared: 0.249

Test for Constraints

	coef	std err	t	P>|t|	[0.025	0.975]
...						
c1	0.1945	0.099	1.968	0.057	−0.006	0.395
c2	1.0862	1.434	0.758	0.454	−1.824	3.996
c3	−0.1058	0.071	−1.491	0.145	−0.250	0.038

c0: Intercept **c1: Curry_Hi_Points_Value** **c2: Win** **c3: Abs_Point_Difference**

PROJECT CHALLENGES

Data Sources: After deciding the topic of my project, I struggled to find accessible data sources, for sponsorship visibility. I originally wanted to use a X (Twitter) API to evaluate sponsorship mentions as sports fans engage more consistently on sports team's social media than news reports. However, X no longer has free API use for student projects and under the free version of the API, you can only request 100 tweets per month, not meeting the requirements for data size in this project.

Data Scope: As I began retrieving, cleaning, and transforming data, I realized I would need to shift the scope (time range, features) of my project to effectively find meaningful relationships within my data. While sponsor trend data covers every day within my project's date range, Warriors' game data only covers the NBA regular season and Warriors' news articles are not posted consistently. After early plotting of my datasets, I re-evaluated what relationships I wanted to measure and derived new features from existing variables for further analysis.

THANK YOU!