

# *The Impact of Sports Team Performance on the Stock Market: Evidence from China Men's National Football Team*

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**Abstract:** This study focuses on China Men's National Football Team and the Chinese stock market to explore how the performance of sports teams affects the stock market of their country. Regression analysis reveals a significant positive correlation between the performance of the Chinese stock market and the achievements of China Men's National Football Team. Notably, superior outcomes by the team on an inter scale are associated with concurrent positive performance in the stock market. Further analysis through interaction term regression suggests that consumer confidence moderates the irrational behaviors of investors influenced by the team's performance. Additionally, the achievements of China Men's National Football Team exacerbate the temporary pricing errors in the stock market caused by irrational sentiments driven by consumer confidence. The findings of this study remain consistent across both the Shanghai and Shenzhen stock exchanges.

## 1. Introduction

Over the past few decades, as living standards have improved, sports activities have increasingly become part of people's lives. More and more individuals are not only actively participating in various sports activities in their leisure time but also keen to follow and watch live broadcasts of sports events, both online and offline. Despite the challenges posed by COVID-19, the 2020 Tokyo Olympics achieved impressive viewership, attracting over 3 billion people globally. The 2018 FIFA World Cup in Russia drew a cumulative audience of over 3.5 billion worldwide, while the 2022 FIFA World Cup in Qatar garnered attention from over 5 billion people. In the final, Argentina's dramatic penalty shootout victory over France captivated nearly 1.5 billion viewers worldwide, including the 88,966 spectators at Lusail Stadium, at the moment Lionel Messi lifted the championship trophy. Social media platforms saw 93.6 million World Cup-related posts, with a cumulative reach of 262 billion and 5.95 billion engagements. Football, as a global sport, has indisputably become one of the most popular and influential sports worldwide. Its wide audience base and profound socio-cultural impact make the outcomes of football matches more than just sports victories or defeats; they often become significant factors affecting mood, economy, and political atmosphere. This unique global appeal

underscores football's growing prominence as the world's leading sport.

China's stock market, one of the fastest-growing financial markets globally, is also known for its significant price volatility. Its unique development trajectory and investor behavior patterns are often described by researchers and market observers as characterized by irrational features. This irrationality is not only reflected in the extent of price fluctuations but also in the decision-making behavior of market participants, which is often influenced by emotions, psychological expectations, and social events, rather than purely based on fundamental analysis. This provides a unique and challenging environment for studying stock market behavior[1-2].

Existing academic research indicates that sports competitions, especially football matches, significantly impact the stock market, primarily through the mechanism of emotions. When the team performs well, the enhancement of pride and positive emotions can stimulate investors' optimism, positively affecting the stock market. Conversely, poor team performance can spread negative emotions, leading to a downturn in market sentiment and affecting stock market performance. This phenomenon is observed in many countries and regions, albeit with varying degrees of research depth and breadth [3-4].

Nevertheless, research on the Chinese market is relatively scarce, and the Chinese stock market has its unique characteristics, such as high policy sensitivity, a unique investor structure (e.g., a high proportion of retail investors), and irrational market volatility features. These factors could influence the nature and strength of the relationship between sports achievements and the stock market. Additionally, the Chinese people possess a strong sense of pride and patriotism, easily leading to irrational emotions due to the sports team's performance. Despite China Men's National Football Team's performance entering a prolonged slump after 2002, it has shown some volatility within small sample periods. Therefore, this thesis aims to explore the impact of sports, particularly the performance of China Men's National Football Team, on the Chinese stock market, filling the gap in existing research and offering a new perspective on understanding irrational behavior in the stock market. By analyzing the relationship between soccer results and the stock market, this study not only enriches the theories of sports economics and behavioral finance but also provides practical insights for market participants, policymakers, and sports administrators

## 2. Data Collection and Processing

Since December 1992, FIFA has calculated and published the rankings of men's football teams, providing a basis for comparing the strengths of these teams. From the first ranking to the present, the number of FIFA members has grown from 167 to 211, with all 211 members now participating in the ranking. FIFA points take into account the win/draw/loss score  $\beta_1$ , goals scored/conceded score  $\beta_2$ , away game bonus  $\beta_3$ , significance of the match coefficient  $\beta_4$ , and the strength of the region  $\beta_5$ . The formula for calculation is as follows:

$$P = (\beta_1 + \beta_2 + \beta_3) * \beta_4 * \beta_5 \quad (1)$$

Since July 2018, the FIFA Council has announced a new ranking system based on the Elo ranking system, which adjusts the points of the participating teams after each match. The formula for points calculation is:

$$P = P_{Before} + I * (W - W_e) \quad (2)$$

where  $P_{Before}$  refers to the team's points before the match,  $I$  represents the significance of the match with values ranging from 5, 10, 15, 25, 35, 40, 50, to 60, covering 8 score levels from friendly matches outside the inter match calendar to the World Cup (quarter-finals and beyond). denotes the

match outcome, where a team scores 0 for a loss in regular time or overtime, 0.5 for a draw or a loss in a penalty shootout, 0.75 for a win in a penalty shootout, and 1 for a win in regular time or overtime.  $W_e$  represents the expected outcome of the match, calculated as:

$$W_e = \frac{1}{10^{-\frac{dr}{600}} + 1} \quad (3)$$

where  $dr$  is the ranking difference between the two teams before the match.

Given that FIFA points effectively measure a football team's overall performance over a certain period, and due to their use as a standard for categorizing inter competitions, they are highly regarded by football teams worldwide. Therefore, we consider using FIFA points as a proxy variable to measure the performance of China Men's National Football Team, serving as our core explanatory variable. This data is published monthly, and we have selected the FIFA points of the Chinese men's football team for each period from July 2018 to December 2023, excluding sample periods without matches (i.e., periods where the points did not change from the previous period), resulting in 20 valid time series data points sourced from the FIFA official website. We also collected the closing price of the SSE Composite Index at the end of the corresponding period as our dependent variable, sourced from the Wind financial terminal. Considering that the performance of the football team could lead to irrational consumer behavior, thereby affecting stock market performance[6], we also selected the Consumer Confidence Index as a proxy variable for consumer sentiment, sourced from the OECD official website. Descriptive statistics of the data are presented in Table 1.

Table 1: Descriptive Statistics

|   | Obs | Mean     | Stdev   | Median   | Skewness | Kurtosis |
|---|-----|----------|---------|----------|----------|----------|
| Stock market closing prices                       | 20  | 3156.266 | 341.052 | 3083.798 | -0.067   | 1.841    |
| FIFA Points                                       | 20  | 1322.000 | 15.407  | 1322.500 | 0.028    | 2.175    |
| FIFA Rankings                                     | 20  | 75.450   | 3.187   | 75.000   | -0.112   | 2.514    |
| CCI   | 20  | 100.975  | 4.533   | 103.000  | -1.081   | 2.295    |
| Stock market closing prices (after normalization) | 20  | 0.000    | 1.000   | -0.212   | -0.067   | 1.841    |
| FIFA Points (after normalization)                 | 20  | 0.000    | 1.000   | 0.032    | 0.028    | 2.175    |
| CCI (after normalization)                         | 20  | 0.000    | 1.000   | 0.447    | -1.081   | 2.295    |

It can be observed that within the selected sample, the closing prices of the stock market exhibit a left-skewed distribution, indicating a tendency towards lower values with more significant extreme values on the left side, often reflecting a sluggish market condition. The FIFA points of China Men's National Football Team show a right-skewed distribution, yet their ranking demonstrates a left-skewed tendency. This implies that although the FIFA points of China Men's National Football Team trend upwards, their relative global ranking is gradually declining, indicating the team's lagging progress in the inter football arena during the period. Meanwhile, the average consumer confidence index is above 100 but also exhibits a left-skewed distribution. This means that while consumer sentiment is generally positive within the sample period, it is susceptible to extreme events, thus presenting certain extreme values on the left end. Overall, however, the distribution of all four variables shows a reasonably good approximation to a normal distribution. To minimize the influence of extreme outliers and standardize the scale, we have also standardized the data. The formula for standardization is as follows:

$$y_{i,t} = \frac{X_{i,t} - \bar{X}_i}{s_i} \quad (4)$$

where  $\bar{X}_i$  is the mean of variable  $X$  and  $s_i$  is the standard deviation of  $\bar{X}_i$ . Furthermore, we have plotted a line graph of the standardized FIFA points against the stock market's closing prices. As shown in Figure 1, within the sample period, a certain degree of co-movement trend between the two can be observed.



Figure 1: Plot of standardized FIFA points against stock market closing prices

### 3. Base Regression

We constructed a baseline regression model as follows:

$$Price_t = \beta_0 + \beta_1 * Point_t + \beta_2 * CCI_t + \mu_t \quad (5)$$

where represents the stock market closing price,  $Point_t$  denotes the FIFA points in the same period, and stands for the Consumer Confidence Index in the same period. The results of the baseline regression are presented in Table 2.

Table 2: Base Regression

|              | Coefficient | St.Err    | t     | P> t  |
|--------------|-------------|-----------|-------|-------|
| <i>Point</i> | 0.8037233   | 0.3323354 | 2.42  | 0.027 |
| <i>CCI</i>   | -0.8106217  | 0.3323354 | -2.44 | 0.026 |
| <i>_cons</i> | -2.34E-15   | 0.2005926 | 0     | 1     |

It was observed that FIFA points are positively correlated with the stock market's closing prices at the same period and are significant at the 95% confidence level. This indicates that the performance of China Men's National Football Team significantly impacts the performance of the Chinese stock market within the same period. When China Men's National Football Team achieves better results, the market tends to offer better returns, consistent with the findings of Bauckloh et al. (2019) [3]. Meanwhile, consumer confidence shows a negative correlation with stock market performance and is significant at the 95% confidence level. This suggests that the more positive the consumer sentiment, the more likely the stock market is to underperform. This aligns with Yang (2006)'s results and may be attributed to market expectations already being reflected in prices, leading to a "buy on rumors, sell on news" scenario and the shifting of assets from investment to consumption [5]. The adjusted R-squared of the model is 0.1953, indicating that the model has a certain explanatory power.

We conducted a robustness check by using the Shenzhen Component Index as an alternative variable for the stock market's closing prices. The analysis confirmed that the conclusions above are

robust.

#### 4. Mechanism Test Regression

Next, we delve into how the performance of China Men’s National Football Team affects the performance of the Chinese stock market. Given that the performance of China Men’s National Football Team can lead to irrational consumer behavior, thereby influencing the stock market, we introduce an interaction term between FIFA points and the Consumer Confidence Index  $Point * CCI$  on the basis of the baseline regression. This allows us to construct a regression equation for mechanism testing:

$$Price_t = \beta_0 + \beta_1 * Point_t + \beta_2 * CCI_t + \beta_3 * Point_t * CCI_t + \mu_t \quad (6)$$

The results of the mechanism testing regression are shown in Table 3:

Table 3: Mechanism test regression

|                    | Coefficient      | St.Err           | t            | P> t         |
|--------------------|------------------|------------------|--------------|--------------|
| <i>Point</i>       | 1.063672         | 0.3919683        | 2.71         | 0.015        |
| <i>CCI</i>         | <b>-1.575096</b> | <b>0.7116791</b> | <b>-2.21</b> | <b>0.042</b> |
| <i>Point * CCI</i> | -0.6859988       | 0.5668078        | -1.21        | 0.244        |
| <i>_cons</i>       | 0.5117022        | 0.4668213        | 1.1          | 0.289        |

The regression coefficient for the interaction term is insignificantly negative, indicating that the impact of China Men’s National Football Team’s performance on the performance of the Chinese stock market is limited by the current consumer confidence. Since consumer confidence represents an aggregate value over a period, the effect of China Men’s National Football Team’s performance on the performance of the Chinese stock market requires a certain transmission time. Therefore, we apply an one–period lag to both the performance of China Men’s National Football Team and the performance of the Chinese stock market to obtain the regression equation for the mechanism test with an one–period lag:

$$Price_t = \beta_0 + \beta_1 * Point_{t-1} + \beta_2 * CCI_t + \beta_3 * Point_{t-1} * CCI_t + \mu_t \quad (7)$$

The results of the lagged mechanism testing regression are presented in Table 4:

Table 4: Regression table for mechanism test with one period lag

|                    | Coefficient       | St.Err           | t            | P> t         |
|--------------------|-------------------|------------------|--------------|--------------|
| <i>Point</i>       | 25.74742          | 15.36012         | 1.68         | 0.114        |
| <i>CCI</i>         | <b>-0.4244067</b> | <b>0.2009474</b> | <b>-2.11</b> | <b>0.052</b> |
| <i>Point * CCI</i> | <b>-0.2461703</b> | <b>0.1388455</b> | <b>-1.77</b> | <b>0.094</b> |
| <i>_cons</i>       | <b>43.79188</b>   | <b>20.78881</b>  | <b>2.11</b>  | <b>0.052</b> |

At this point, the regression coefficient for the interaction term is significantly negative at the 90% confidence level, opposite to the sign of the coefficient for Point and identical to the sign of the coefficient for *CCI*. This suggests that consumer sentiment weakens the impact of the performance of China Men’s National Football Team on the performance of the Chinese stock market. However, the performance of China Men’s National Football Team, in turn, strengthens the impact of consumer sentiment on stock market performance. This could be because consumer sentiment to some extent moderates the irrational behavior prompted by the performance of China Men’s National Football Team, shifting from one type of irrational behavior to another. Meanwhile, the irrational behavior resulting from the team’s performance exacerbates the impact of consumer sentiment on the stock market, leading to even more irrational emotions and affecting the stock market’s performance,

causing temporary pricing errors driven by sentiment in the stock market. The adjusted R-squared of this model is 0.1004.

## 5. Conclusion

This paper investigates the impact of the performance of China Men's National Football Team on the stock market. The study finds that the performance of China Men's National Football Team significantly affects the Chinese stock market. When China Men's National Football Team achieves results higher than expected on the inter stage, the Chinese stock market tends to rise concurrently. Conversely, when China Men's National Football Team is in a slump internationally, the Chinese stock market also enters a negative phase. Consumer confidence moderates the irrational behavior of investors influenced by the performance of China Men's National Football Team. However, extreme consumer confidence can lead the Chinese stock market into an irrational state. The performance of China Men's National Football Team exacerbates the temporary pricing errors in the stock market caused by irrational emotions due to consumer confidence, leading to a more severe irrational market state. This conclusion has been robustly tested across both the Shanghai and Shenzhen stock markets. Therefore, we call on market participants to rationally view the achievements of China in the sports field, and policymakers should prepare for stock market volatility in response to the performance of sports teams.

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