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The Impact of Game Scores on the Revenue

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Abstract

With the commercialization of the football market. The football club behaves more and more like an ordinary company. Sports economics become more and more important. This paper will compare the performance of the English football clubs with the several revenue items of the football clubs. These comparisons will be analyzed using correlation coefficients. This paper will help club management and external investors to better understand the relationship between football club performance and football club income. To help operators better realize the virtuous circle of club performance and income. Help investors better predict the rate of return. The research shows that for English Premier League clubs, performance has a significant positive impact on the club's media income. For the clubs in the English Football League Championship, performance has a significant negative impact on the club's commercial income. Nevertheless, performance still has a significant positive impact on the total revenue of football clubs. Measuring the club's performance is very helpful in predicting the club's total income.

JEL Classification: G32, L83

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1. Introduction

In 1885, the FA approved the payment of wages to football players. Professional football was born (Talor, 2007). In 1983, Tottenham Hotspur Football Club, located in London, England, was listed in London. It is the first football club which went public. In July 2003, Abramovich purchased the Chelsea football club from the Premier League and invested a lot of money to build the lineup of the team. Since then, a lot of money has begun to swarm into European soccer. European soccer has begun the process of commercialization and capitalization. In the 20 years since then, more and more capital has entered the football market. According to Ozanian, there are 13 football clubs worth more than \$1 billion in 2021. 10 football clubs are more than \$2 billion. The market value of six clubs excess four billion U.S. dollars.¹

However, when football attracted more and more attention, the arrival of the covid-19 epidemic interrupted this rapid development momentum. In 2019, the size of the football market was 28.9 billion euros. By 2020, the size of the football market has dropped to 25.2 billion euros. The entire market has shrunk by 13%.² Many football clubs have encountered financial crisis and have to cut expenditures through various means in order to avoid bankruptcy. Barcelona, considered by Forbes to be the most valuable football club, had to give up renewing the contract with the star Lionel Messi due to salary issues. After 17 years of playing for the club, the greatest player in club history had to leave Barcelona. More small and medium-sized clubs declared bankruptcy due to unsustainable circumstances.

1 Ozanian, M. (2021, April 19). The world's most Valuable Soccer Teams: Barcelona Edges Real Madrid to land at No. 1 for first time. Forbes. Retrieved September 21, 2021, from <https://www.forbes.com/sites/mikeozanian/2021/04/12/the-worlds-most-valuable-soccer-teams-barcelona-on-top-at-48-billion/>.

2 Lange, D. (2021, September 10). European soccer market size 2006-2020. Statista. Retrieved September 21, 2021, from <https://www.statista.com/statistics/261223/european-soccer-market-total-revenue/>.

In such an environment, it becomes more important to understand the relationship between the performance of the team and the income of the club. This study will use the method of correlation analysis to quantitatively analyze the relationship between club performance and income. The study will cover 44 football clubs in the English Premier League and the English Football League Championship. This paper will help club management and external investors to better understand the relationship between football club performance and football club income. To help operators better realize the virtuous circle of club performance and income. Help investors better predict the rate of return.

The study shows that since the proportion of broadcast expenses is determined by the club's ranking in the league, for Premier League clubs, performance will have a significant positive impact on the club's media income. For small and medium-sized clubs, performance will have a significant negative impact on commercial income. Influence. This result may be due to differences in the audiences of clubs of different sizes. The audience of small and medium clubs is mainly local fans in the club's location. The audience of large clubs is fans from all over the world. For the club's total revenue, the club's performance will still have a very significant positive impact. The square of the performance variable IND has a very significant positive relationship with the club's total revenue.

As more and more capital enters the football market, managers and investors are paying more and more attention to the relationship between club performance and related variables. Many studies have made different efforts to explore the relationship, such as payroll level and performance (Hall et al, 2002). Many studies have also made efforts to explore how to quantify the performance of clubs, such as league ranking (Dubson and Goddard, 2001) and cup system (Barajas et al, 2007). The paper focus on the relationship between revenue and performance. We

also include some of the related variables in our regression. This can help us better understand the relationship between performance and related variables and club revenue.

The remainder of the research is organized as follows. The section 2 introduces the components of club income and how to quantify club performance. The section 3 describes the research data and experimental methods. The section 4 presents the regression results and robustness check. The section 5 gives the concluding.

2. Literature Review and Hypotheses Development

With a large amount of capital entering the football world, a large amount of cash flow has appeared on the books of football clubs. The operation of the club has also begun to become more professional, just like a general company. For club managers, how to make good use of these funds for the healthy development of the club is very important. So, for the club, what are the sources of funds? How to judge the performance of the club?

2.1. Revenue of the Football Clubs

Generally speaking, the three main sources of revenue of the football clubs are match income, media income and commercial income. Match income comes from the stadium (Chanavat and Desbordes, 2017). The match will attract a large number of spectators to the stadium. To enter the stadium, they first need to pay for the match tickets to the club. On the other hand, a large number of spectators coming to the stadium will drive the business of the shops around the stadium. The spectators will have a rest, eat and shop. These businesses need to

pay the rental fee of the store to the owner of the stadium. The owner of the stadium is generally a club. Media income mainly comes from TV broadcasting contracts. TV broadcasters usually package with the league in which the club is located to purchase broadcast rights for one or more seasons. After that, the league will distribute the revenue to the football clubs of the league. The price of broadcast rights for the Premier League's three seasons since 2013 is 5.5 billion pounds. According to the league rankings of the clubs in each season, these revenues will be distributed to the clubs in a certain proportion (Harris, 2012). The commercial income of the club mainly comes from the advertising income from sponsors. The most common one is the jersey advertisement. Sports brands provide teams with jersey contracts. Teams wear jerseys from these sports brands for competitions and training to promote these brands. The sports brand will pay advertising costs and a portion of sales to the club. The Barcelona football club from Spain receives more than 100 million euros in revenue from Nike every season. Manchester United in England will receive up to 75 million euros in revenue from Adidas.³

2.2. Performance of the Football Clubs

Football itself does not produce economic benefits. The football club brings pleasures to the fans through victory. These pleasures will be transformed into the revenue of football clubs through specific method. Therefore, the performance of the team is crucial to the club's income. Good performance can attract fans and sponsors and increase club income. Poor performance will make the team lose its fans and sponsorship. According to Hall et al (2002), the research studied the relationship between team performance and payroll. The European soccer

³ Redmond, R. (2021, August 6). Here's how much money Premier League clubs make from Jersey sales. Pundit Arena. Retrieved October 2, 2021, from <https://punditarena.com/football/robredmond/football-clubs-jersey-sales-premier-league/>.

league is more competitive and lacks salary caps and other restrictions. The value of the player can be expressed more directly based on the salary. The high payroll level of the team usually leads to good team performance.

However, the performance of football clubs is always difficult to quantify and calculate. This problem not only troubles economists, but also troubles the organizers of football matches. From the 1994-1995 season, the Italian Serie A began to implement the three-point system. The three-point system means that when the team wins, they can get three points. While a loss represents zero points, a tie represents one point. When all the teams in the league complete the double round robin, the team with the higher score will be ranked higher. In 1999, this season's final ranking was used for the first time to quantify team performance (Szymanski and Kuypers, 1999). However, the shortcomings of this method are obvious, it cannot be used to quantify the performance of the cup. The final champion is decided in the form of a knockout tournament. Except for the champion and runner-up, most teams will not have a final ranking. In order to obtain quantifiable variables, Barajas et al (2007) designed a cup system to measure the team's performance in domestic cups, the UEFA Europa League and the UEFA Champions League. This system will give points based on the results of each team match and the team's final position. Since each match has a different importance, the weight of each match will change. The UEFA Champions League is the highest hall of European football. A good performance in the UEFA Champions League will bring huge economic benefits to football clubs. League performance is the basis of club operations. For all clubs that do not qualify for the UEFA Champions League, the performance of the league is the most important. Barajas et al considered the importance of different games to the club from an economic viewpoint, and set different

weights for different matches. They combined the league and cup performances to develop a compound index that reflects the team's performance in 1 season.

2.3. Hypothesis Development

Since the TV broadcast income of the club's media income is distributed according to the team's final season ranking, the performance and the media income will show the strongest correlation. The football club's commercial revenue includes sponsorship contracts. Therefore, the commercial income of the team will often appear to be different from the performance of the team. The club's match revenue comes from the tickets for the fans to enter the stadium. The correlation between match revenue and team performance will lie between media revenue and commercial revenue.

3. Data and Methodology

The data for this study comes from Her Majesty's Government⁴. The big football clubs in England are all listed companies. They will disclose their financial information like normal companies. The revenue information will be displayed in the statement of profit or loss. The revenue consists of three parts: matchday, commercial and broadcasting. These three parts correspond to match income, commercial income and media income respectively.

This research will use the compound index specified by Barajas et al (2007) to quantify the performance of football clubs in a season. This compound index (*IND*) is obtained by adding

⁴ All listed companies in UK will update their information in this website. <https://find-and-update.company-information.service.gov.uk/>

the performance scores of each team in the FA Cup, English League Cup, League, Europa League and UEFA Champions League. The compound index (*IND*) can be expressed as:

$$IND = \sum_{i=1}^5 \alpha_i P_i \quad (1)$$

The league's performance scores are directly represented by the league points each team has obtained in a season. The team's performance in the FA Cup and the English League Cup is quantified using a cup model. Each team can get three points in the next round in the non-elimination stage, and six points in the elimination stage and advance to the next round. The winning team can get an additional six points. Then, the FA Cup winner can get 39 points and the runner-up can get 33 points. The Champion of the League Cup can get 36 points and the runner-up can get 30 points. The performance of the Europa League and the UEFA Champions League uses the same winning points system as the league. While scoring three points in a win, one point in a tie. Their qualified matches are less important, with 1 point for victory and 0.5 point for draw. When the club enters the group stage of the main match, five points will be added to the performance points. When the club enters the elimination stage, it will get one point. After that, every time it enters the next stage, the performance points will be added by one point. The rule of three points for a victory and one point for a tie also applies in the elimination stage. The sum of the performance points of these different matches multiplied by different weights is the club's season performance points. According to the importance of the game, the weight of the UEFA Champions League (UCL) is three. The weight of the Europa League (UEL) and the league is two. The weight of domestic cup matches is one. It is worth noting that the samples of Barajas, Fernandez and Crolley are Spanish football clubs. The Spanish domestic cup is the Copa del Rey. The sample for this study is English football clubs. Football clubs in England need to

participate in the FA Cup and the English Football League Cup (EFL Cup) within one season. So, the weight of each cup is 0.5. The expression will be:

$$IND_i = 0.5 \times FA_i + 0.5 \times EFL_i + 2 \times League_i + 2 \times UEL_i + 3 \times UCL_i \quad (2)$$

In terms of methodology, the study will use multiple regression analysis to explore the relationship between football club income and related variables. The expression is:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (3)$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (4)$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (5)$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (6)$$

In the expression, MI , MEI , CI and RV represent match income, media income, commercial income and total revenue, respectively. β_0 is a constant. X_1 is the compound index of the team's performance (IND). This index is used to quantify the performance of football clubs. X_2 , X_4 and X_5 are the salaries and wages (SW) of the football club in the season, the value of the club's assets (AS) and the capacity of the stadium (SC). X_3 is the amortization change of the fixed intangible assets of the football club during the season (PR). This fee can be used to measure the club's expenditure on player transfer fees in recent seasons. The ε represents the error of each equation. The sample for this study is 44 football club in the English Premier League and English Football League Championship. The sample period is the season (2019 – 2020). In this season, the covid-19 epidemic broke out in the middle of the season. The Derby County, Queens Park Rangers and Wigan Athletic, these three clubs in English Football League Championship are facing the crisis of bankruptcy. Their financial information is not exposed on the website. Out sample will exclude these three clubs. The sample will include 41 football clubs.

4. Results and Discussions

4.1. Main Results

The regression results show that for clubs playing in the Premier League, club performance has a significant positive impact on media income, the coefficient is 287.7. The same fact did not happen to the clubs in the English Football League Championship. The cause for this is the difference in the distribution of broadcast rights between the Premier League and the Premier League. The broadcast rights of the Premier League are packaged for sale and will give each club the same basic income. At the end of the season, each team will be allocated additional bonus income based on their ranking in the league. The ranking in the league is directly linked to the performance of the club. Therefore, the club's performance will affect the club's media income to a large extent. The broadcast rights income of the English Football League Championship is not directly divided according to the league's ranking. Moreover, most of the clubs in the English Football League Championship are small and medium-sized football clubs. When they accounted, they usually combined the media income and match day income. This makes it difficult to accurately calculate the media income of the English Football League Championship Club. Therefore, for the English Football League Championship club, the performance of the club did not have a significant positive impact on media income.

The regression results also show that for clubs in the Premier League and the Football League Championship, club performance has a significant negative impact on commercial income, the coefficient is -157.7. This fact is contrary to the common sense of the public. It is generally believed that the club's performance will have a positive impact on income. Comparing the

impact of performance on Premier League clubs and the Football League Championship clubs, the results show that performance is positively correlated with the commercial income of Premier League clubs. At the same time, performance is negatively correlated with the commercial income of the Football League Championship. A possible explanation for this is that for small and medium-sized clubs, the club's target group is mainly local fans. The club maintains relationships with local fans through various activities to gain support from fans. The performance of the club has little effect on this relationship. For large clubs, the club's target group is local fans and fans from all over the world. Fans from all over the world increase the income of the club by watching broadcast games and buying products endorsed by the club. In addition to participating in the Premier League, large clubs also participate in the UEFA Champions League and the Europa League. Good results will increase the club's public exposure and attract more fans worldwide. Sponsors provide sponsorship fee for the club for marketing purposes and increase the club's commercial income. Although performance has a negative impact on the commercial income of small clubs, performance still has a relatively significant positive impact on the total revenue of football clubs, the coefficient is 187.9.

4.2. Additional Results

This paper uses quadratic nonlinear regression to further verify the relationship between performance and club income. In the new equation, the variable of the square of IND is added to the equation:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i \quad (7)$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i \quad (8)$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i \quad (9)$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i \quad (10)$$

The results of the regression analysis show that performance is more closely related to club income. The square of *IND* has a very significant positive impact on the club's total revenue, with a coefficient of 1.575. As in the previous equation, salary and wages still have a significant positive effect on the club's total revenue, with a coefficient of 0.620. The new equation shows a closer connection between performance and club income.

4.3. Robustness Checks

In robustness checks, this paper uses variable *C* instead of *IND* to represent the club's performance. The expression of variable *C* is:

$$C_i = -\log\left(\frac{P_i}{n+1-p_i}\right) \quad (11)$$

Where *n* is the number of clubs and *p* is the ranking of the clubs. The expression after replacing *IND* is:

$$MI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (12)$$

$$MEI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (13)$$

$$CI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (14)$$

$$RV_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i \quad (15)$$

The regression results of the new expression show that performance has a very significant positive impact on the club's media income, with a coefficient of 37138.7. The reason is that the variable *C* is completely determined by the club's ranking in the league. The ranking in the league will directly determine the distribution of broadcast costs, and to a large extent affect the club's media income. However, the positive impact of *C* on the total revenue is not significant. The explanation for this is that the variable *C*, which is determined by the league

ranking, ignores the club's performance in domestic cups and intercontinental competitions. The variable C also ignores the importance of the game.

5. Conclusions

Since the proportion of broadcast expenses is determined by the club's ranking in the league, for Premier League clubs, performance will have a significant positive impact on the club's media income. For small and medium-sized clubs, performance will have a significant negative impact on commercial income. Influence. This result may be due to differences in the audiences of clubs of different sizes. The audience of small and medium clubs is mainly local fans in the club's location. The audience of large clubs is fans from all over the world. For the club's total revenue, the club's performance will still have a very significant positive impact. The square of the performance variable IND has a very significant positive relationship with the club's total revenue.

The research found the close relationship between revenue and performance of English professional football clubs. The paper perfected the relationship between income and performance with payroll. Investors and managers can determine the IND by estimating the performance of the team, and use the IND to predict the club's income. However, the paper did not test the conclusion with previous season data. Also, further study could use data from football clubs in other regions to verify the relationship between revenue and performance.

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Table 1: Descriptive Statistics

The table reports the relevant data and ratios of 41 football clubs in the sample. The dependent variables are match income (*MI*), media income (*MEI*), commercial income (*CI*) and total revenue (*RV*). The independent variables are *IND*, salaries and wages (*SW*), Amortization of the fixed intangible assets (*PR*), total assets (*AS*) and stadium capacity (*SC*).

	Obs.	Mean	Median	Std. Dev	Minimum	Maximum
<i>MI</i>	41	14,894	6,670	21,487.91	658	90,154
<i>MEI</i>	41	63,919	44,678	56,571.41	0	201,585
<i>CI</i>	41	39,414	11,179	68,013.18	854	265,055
<i>RV</i>	41	118,204	44,678	134,598.8	6,863	489,860
<i>IND</i>	41	226.4024	190.5	109.6555	96	460.5
<i>SW</i>	41	81,693	63,913	77,268.58	6,215	307,278
<i>PR</i>	41	104,762	36,912	138,631.5	0	529,091
<i>AS</i>	41	235,396	122,034	301,704.3	9,625	76,212
<i>SC</i>	41	33,531	30,576	14,462.6	10,226	76,212

Table 2 Correlations

The table shows the correlation coefficient of each variable.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>	<i>IND</i>	<i>SW</i>	<i>PR</i>	<i>AS</i>	<i>SC</i>
<i>MI</i>	1.000								
<i>MEI</i>	0.643***	1.000							
<i>CI</i>	0.867***	0.745***	1.000						
<i>RV</i>	0.868***	0.899***	0.957***	1.000					
<i>IND</i>	0.666***	0.946***	0.777***	0.897***	1.000				
<i>SW</i>	0.795***	0.895***	0.922***	0.969***	0.896***	1.000			
<i>PR</i>	0.809***	0.833***	0.933***	0.950***	0.836***	0.959***	1.000		
<i>AS</i>	0.855***	0.757***	0.941***	0.930***	0.823***	0.909***	0.925***	1.000	
<i>SC</i>	0.718***	0.560***	0.767***	0.737***	0.640***	0.704***	0.707***	0.782***	1.000

Table 3 Main Regression Results of Premier League Clubs

The table shows results of 4 in-sample regression:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

The dependent variables are match income (*MI*), media income (*MEI*), commercial income (*CI*) and total revenue (*RV*). The independent variables are *IND*, salaries and wages (*SW*), Amortization of the fixed intangible assets (*PR*), total assets (*AS*) and stadium capacity (*SC*). The table shows the sample data results of 20 football clubs in English Premier League. The table lists the coefficient of each independent variable and statistics significance.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>
<i>IND</i>	-33.055 (-0.250)	287.698** (2.570)	211.633 (1.183)	467.862 (1.494)
<i>SW</i>	0.113 (0.601)	0.480*** (3.026)	0.351 (1.384)	0.942* (2.122)
<i>PR</i>	-0.009 (-0.099)	-0.028 (-0.363)	0.094 (0.459)	0.057 (0.263)
<i>AS</i>	0.043 (1.352)	-0.055* (-2.060)	0.059 (0.189)	0.047 (0.631)
<i>SC</i>	0.276 (0.755)	-0.220 (-0.712)	0.779 (0.137)	0.823 (0.951)
<i>Constant</i>	-7,230.2 (-0.219)	-7,422.4 (-0.269)	-116,722** (-2.62)	-131,569 (-1.684)
<i>Obs.</i>	20	20	20	20
Adj-R ²	0.609	0.837	0.924	0.913

Table 4 Main Regression Results of League Championship Clubs

The table shows results of 4 in-sample regression:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

This table shows the sample data result of 21 football clubs in English Football League Championship. The table lists the coefficient of each independent variable and statistics significance.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>
<i>IND</i>	-2.349 (-0.044)	5.356 (0.033)	-3.422 (-0.043)	-0.415 (0.003)
<i>SW</i>	0.065 (0.698)	0.350 (1.250)	0.257* (1.868)	0.673*** (3.066)
<i>PR</i>	-0.037 (-0.519)	0.644*** (3.034)	-0.104 (-0.996)	0.503*** (3.029)
<i>AS</i>	-0.013 (-0.368)	-0.029 (-0.276)	0.016 (0.307)	-0.026 (-0.316)
<i>SC</i>	0.104 (0.797)	-0.701* (-1.784)	0.211 (1.096)	-0.385 (-1.252)
<i>Constant</i>	2,568.6 (0.364)	13,400.4 (0.632)	-5,968.1 (-0.573)	10,000.9 (0.602)
<i>Obs.</i>	21	21	21	21
<i>Adj-R²</i>	-0.142	0.545	0.428	0.773

Table 5 Main Regression Results of All Clubs in Sample

The table shows results of 4 in-sample regression:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

This table shows the sample data result of 41 football clubs in English Football League Championship and English Premier League. The table lists the coefficient of each independent variable and statistics significance.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>
<i>IND</i>	-51.770 (-1.355)	397.476*** (7.622)	-157.717** (-2.466)	187.852* (1.91)
<i>SW</i>	0.090 (0.857)	0.305** (2.134)	0.426** (2.428)	0.821*** (3.046)
<i>PR</i>	0.001 (0.025)	0.073 (0.999)	0.087 (0.970)	0.160 (1.169)
<i>AS</i>	0.048** (2.601)	-0.070*** (-2.813)	0.107*** (3.482)	0.085* (1.798)
<i>SC</i>	0.192 (0.954)	-0.229 (-0.833)	0.438 (1.302)	0.393 (0.760)
<i>Constant</i>	1,474.4 (0.203)	-34,369.3*** (-3.461)	-8,602.3 (-0.706)	-41,279.8** (-2.207)
<i>Obs.</i>	41	41	41	41
<i>Adj-R²</i>	0.718	0.924	0.921	0.952

Table 6: Quadratic Nonlinear Regression

The table shows results of the quadratic nonlinear regression:

$$MI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i$$

$$MEI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i$$

$$CI_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i$$

$$RV_i = \beta_0 + \beta_1 IND_i + \beta_2 IND_i^2 + \beta_3 SW_i + \beta_4 PR_i + \beta_5 AS_i + \beta_6 SC_i + \varepsilon_i$$

The square of the variable of performance (IND^2) is added into the equation. This table shows the sample data result of 41 football clubs in English Football League Championship and English Premier League. The table lists the coefficient of each independent variable and statistics significance.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>
<i>IND</i>	-103.7 (-1.092)	380.6*** (2.896)	-692.0*** (-5.475)	-416.4* (-1.891)
<i>IND</i> ²	0.135 (0.592)	0.044 (0.140)	1.392*** (4.618)	1.575*** (2.997)
<i>SW</i>	0.073 (0.661)	0.300* (1.990)	0.248* (1.716)	0.620** (2.457)
<i>PR</i>	0.002 (0.028)	0.073 (0.986)	0.088 (1.246)	0.162 (1.313)
<i>AS</i>	0.044** (2.306)	-0.071** (-2.701)	0.074*** (2.900)	0.0473 (1.068)
<i>SC</i>	0.205 (1.004)	-0.224 (-0.801)	0.574** (2.132)	0.547 (1.165)
<i>Constant</i>	6,410.8 (0.577)	-32,763** (-2.150)	42,201.1*** (2.879)	16,184.7 (0.634)
<i>Obs.</i>	41	41	41	41
<i>Adj-R</i> ²	0.712	0.922	0.950	0.961

Table 7: Alternative Performance Measure

The table shows results of 4 in-sample regression:

$$MI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$MEI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$CI_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

$$RV_i = \beta_0 + \beta_1 C_i + \beta_2 SW_i + \beta_3 PR_i + \beta_4 AS_i + \beta_5 SC_i + \varepsilon_i$$

The variable of performance (*IND*) is replaced by the alternative measure of performance (*C*). This table shows the sample data result of 41 football clubs in English Football League Championship and English Premier League. The table lists the coefficient of each independent variable and statistics significance.

	<i>MI</i>	<i>MEI</i>	<i>CI</i>	<i>RV</i>
<i>C_i</i>	-5,839.481 (-1.118)	37,138.749*** (3.840)	-17,278.576* (-1.935)	14,023.471 (1.017)
<i>SW</i>	0.083 (0.755)	0.462** (2.281)	0.397** (2.124)	0.941*** (3.258)
<i>PR</i>	-0.001 (-0.025)	0.067 (0.659)	0.080 (0.849)	0.146 (1.000)
<i>AS</i>	0.045** (2.479)	-0.052 (-1.525)	0.100*** (3.188)	0.094* (1.945)
<i>SC</i>	0.190 (0.935)	-0.217 (-0.579)	0.432 (1.246)	0.395 (0.738)
<i>Constant</i>	-8,767.1 (-1.256)	38,623.2*** (2.987)	-39,428*** (-3.303)	-9,368.3 (-0.508)
<i>Obs.</i>	41	41	41	41
<i>Adj-R²</i>	0.713	0.858	0.916	0.949