Predicting Market Value of Iranian Football Players
Using Linear Modeling Techniques

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Abstract

Purpose: The purpose of this study was to predict the market value of professional football players in the Iranian Premier League in the 2020-2021 season of Iranian football.

Methods: method of the present study was descriptive-survey. The statistical population of the present study included all Iranian and foreign players working in the Iranian Football Premier League, which totaled 409 people the appropriate sample size for the research was calculated based on the community sampling formula and at a 5% error level, 200 people were calculated descriptive statistics was used for analysis and multiple regression method was used for inferential analysis.

Results: Results showed that there is a significant relationship between player valuation and age variables, goalkeeper position, midfielder position, striker position, individual awards, foot position and number of games therefore, it can be concluded that when evaluating, the mentioned factors should be considered to attract the desired players of the clubs in the transfer seasons.

Conclusion: In general, it can be acknowledged that the estimated coefficients of this model have the necessary efficiency to determine the market value of professional football players in the Iranian league.

Keywords: Market Value, Player, Commercialization, Football

Introduction

The sports industry has features of increasing domestic demand, increasing employment, and creating new points for economic and business growth (Xu & Yang; 2019). With the continuous development of the sports industry, the impact of the sports industry's advancement on economic development has gradually become apparent (Yang, Xu, & Ruoyu 2020). Having a stimulus factor such as large sports games, this industry provides advertisement opportunities in the media which can create the necessary grounds for interaction between industry, trade, and sports (Rezaei; 2017). Professional sports defined as sports used means of earning an income, have become a main part of the sports industry. Professional athletes receive high salaries. These salaries are usually funded through selling games' tickets, the right to telecast games, and companies' financial support (Rezaei Sufi; 2017). Football is a sport through often refer to as one of the most popular sports in the world; which has the most viewing audience (Bondarik; 2020). Iran to, considers footballs one of the most popular sports, with it being part of society and gaining more significance by the day. For this reason, sports authorities, directors, and organizations should pay more attention to this sports field (Sadeghi; 2009). The Deloitte Economic Organization predicted the financial turnover for the European football industry at about 22 billion Euros in the 2014-2015 season and at 25 billion Euros in 2016-2017 season. Therefore, nowadays, football holds all necessary factors for becoming an "industry". Football is a growing trade and has led to a significant economic interest amongst different consumers and many beneficiaries (Yiapanas; 2020). In many countries, holding professional leagues and the professional football club owning industry has led to desirable economic growth and development in the football industry (Rezaei; 2016). Nowadays football clubs around the world have turned into professional commercial companies. For instance, currently, twenty of the major UK clubs are on London's stock exchange, and thousands of football fans are shareholders of these clubs and through trading these shares, in addition to gaining profit, they also provide major financial support for their favorite clubs. This type of administration has led clubs to achieve their two main goals that are commercial and sports success (Deldar; 2016). Governmental cooperation, public relations, development of capacity and culture, has had a positive and significant impact on sports' commercialization in some parts of football. Governmental cooperation, public relations, development of capacity, and national culture were substantial strategic factors for commercializing football in Kenya, and it is suggested that the management of football organizations in Kenya should mainly adopt different strategic factors including governmental cooperation, public relations, development of capacity and national culture to ensure commercialization in some parts of football in Kenya (Origi; 2019). Global marketing strategies have analyzed the Bayern Munich club in terms of sports achievements, financial performance, and the number of global fans. In addition, this club's previous steps taken in attracting domestic and international fans along with revenue-generating tools for clubs and interactions between them and sports teams can be effective in increasing the brand's special value (Baena; 2016).

In a managerial approach, one of the most important decisions that team directors make is the decision regarding players' transfers (Nazari; 2019). The market values can be considered as the estimation of transfer costs; meaning the costs and prices that are paid for a player in the football transfer market. One of these sources is the German website "transfer market", which conducts the controlling and judgments on the value of play-

ers in the transfer market. based on information mentioned in this website, the most detailed information regarding important and main players are recorded, and on the other hand, the point of views of experts are also used, and their value are addressed based on the analysis of this data in the market. While these prices and their value are not directly obtained through algorithms, nonetheless, there are factors from all existing aspects in this regard that are significant, and have been discussed in the matter of decision-making and determining the numerical value and price of a player in the transfer market (He; 2015). Considering that the material value of the professional football players was economically very important and effective for clubs, it seems that the methodology for predicting their value in the market as a real asset can affect the entire football industry, insurance status, and international investment for all those involved this sport. Furthermore, football clubs are involved in both the quantitative and qualitative aspects in their relevant developing industry, and this matter is purposive in all transfers and is also significant in negotiations related to players' salary and evaluating their price in any aspect (Van; 2011).

Through recent decades, several sports clubs have been active in the structure of Iranian sports, which a large part of these clubs are supported by governmental organizations or are financially funded by these organizations and institutes and sometimes by the private sector, and all costs related to the capital share of these clubs which includes football players' transfer costs, are funded from these sources (Izdiar; 2015). Professional football clubs are generally involved in three activities. The first activity is generating income from ticket sales, telecasting rights, and recruiting financial supporters. The second activity includes the million dollars football players' trades or transfer contracts in different teams. finally, the third activity is training

creative and talented players to eventually use their interests in the future (Tunaru; 2005). The value of each player from one club to another differs depending on the number of performance criteria such as membership at a foreign club, injury's effects, and the level of their previous club. For evaluating the players' economic value, their sports performance information was used and the findings showed that a one percent increase in social value leads to a 5 percent increase in the player's transfer contract and other factors play a role in the valuation of players, which includes age and nationality and brings along a high value for the player. Further, this effect goes back to the fact that famous and more important teams strongly compete for the number of top players they recruit which is also limited in number. Furthermore, results show that capable clubs have more financial capability for generating more an economic output that is more than the players' media value (Chan; 2014).

Due to strong dependence on governmental or industrial organizations' budgets in Iranian sports clubs especially those that are only active in the field of football such as Sepahan, Zobahan, Saipa, Foolad Khuzestan, Esteghlal, and Persepolis; less cost management and financial management is considered in these clubs in line with balancing budgets related to the transfer market, and for this reason, less attention is also paid to revenue-generating sources (Sadeghi; 2009). Given that sports clubs need significant financial sources for providing their necessary costs in the transfer market, buying the necessary players and the ability to predict what role will the intended player play in the transfer market during each season of the Iranian professional league and the price of each player are the among the best effective economic variables on the demand in the transfer market. Inevitably, their predicted price and value is somewhat the most essential element in the effective marketing factors at sports

clubs (Morrow; 1999). Accordingly, in topics related to sports clubs' marketing, especially in paying attention to the mixed marketing element, several factors are consisted such as people, price, product or products' advertisement. Price is the only factor that generates income, while the other three factors bring along costs. Furthermore, price is the most flexible marketing mix factors and the mix factor that creates the fastest reaction in competitors (Izdiar; 2015). Considering the addressed issues in regards to the price and value of players in the transfer market and also given the financial sources for clubs' participation in the transfer market, the disagreement and bargaining and somehow predicting the value of players and the contract prices are amongst controversial topics that, throughout recent years, has had more presence compared to previous years considering the players' inclination towards becoming professional in the Iranian football. However, governmental authorities don't have any concerns about the profit and loss of clubs that are somewhat a type of economic enterprise (Sadeghi; 2009).

One of the most important of these sources is the players' trades. According to the mentioned matters, it can be said that the premier football league is one of the competitions in Iran which is held professionally. The process of transferring players in the Iranian premier football league is necessary because it leads to the attractiveness of the games and the presence of audiences at stadiums. Besides, sports teams need support and the presence of audiences can be referred to as one of the success factors of these teams. Therefore, the presence of star players is effective in games and teams' results, and on the other hand, is considered as great financial sources for clubs. Hence, understanding effective factors on the transfer of players in the Iranian premier football league can help team authorities in the path of generating more income. Using the possible findings, we can

create a positive impact on creating more realistic players' salaries and bringing their maximum value closer to reality in the transfer market. From another perspective, the failure to predict players' valuation in the transfer market not only can be destructive for the development of teams but, from another perspective, can be also very necessary for those players and intermediaries that are involved in transfers. According to the discussed matters, it can be stated that nowadays, after going through many changes from being a simple sport, football has turned into a business and has found its position amongst other existing industries and professions. In the meantime, the important matter is that since the professional football industry is newly emergent industry in Iran, the subject of the economic development of the football industry is strongly in need of ordered and organized researches. By conducting such researches, suggestions can be offered to the governmental and non-governmental policy-makers so that they can take essential steps through research-oriented decision-making for the economic development of the country's football industry.

On the other hand, one of the effective factors in football is the increasing growth of the brokerage phenomenon in Iranian football, which can be said that its growth rate has surpassed football's technical development and even football's components. Most of these people have no football experience or even knowledge and are not in a very appropriate position, academically and socially, and they have entered into this field with the help of their networks, friends, or family, and they have had the most impact on football during the recent years. According to these factors, conducting such researches seems necessary, and designing an appropriate model for the matter of players' transfer in the premier football league can be an important step in this regard. The lack of a codified policy

based on which transfers could occur, considered as one of the major problems that the premier football league's clubs are facing. Therefore, designing a codified model for the transfer of the premier football league's players can resolve a number of these problems. Ergo, the researcher intends to answer the question regarding which factors of the market value of the Iranian football players are being evaluated?

Materials and Methods

The objective of the present research is to predict the market value of the Iranian premier football league's players during the 2019-2020 season. This research was an applied type to be utilized by Iran's football's beneficiaries. The present research was quantitively approaches. In terms of method, it is a descriptive-survey study and in terms of objective, it has an applied aim. In this study, the market value of the Iranian premier football league's players during the 2019-2020 season, which included 409 individuals, was predicted through liner modeling techniques.

The studied variables were investigated within the framework of a conceptual model and description modality, and variables' measurement for this research was focused on the predictive factors for the valuation in the transfer market of the Iranian professional football league in the 2019-2020 season using the statistical modeling techniques on. To achieve this objective, two stages were used: A- information has been collected and organized as a dependent variable (market value) and independent variables (predictive factors); B- the predictive factors were studied using the best-selected model, and finally, discussions regarding each factor was carried out and a final conclusion was reached. The statistical population for this research includes all Iranian foreign players employed in Iranian football, which were a total of 409 individuals. This number of players were solely studied for the 2019-2020 season.

For this research, appropriate sample size was calculated based on the sampling from limited population formula and at a 0.5 level alpha error and as the following:

$$n = \frac{N \times Za^2/2 \times p(1-p)}{Za^2(N-1) + Za^2 \times p(1-p)} = \frac{409 \times (1.96)2^2 \times 0.5 \times 0.5}{1.96^2 \times (409-1) + 1.96^2 \times 0.5(1-0.5)} \sim 200$$

The field data collection method was used for this study. Since all the necessary information of players who constituted the statistical population in this research, were available through the organizer committee of professional league games, therefore, the data collection was performed directly from the players' existing contracts at that organization and also by visiting the Iranian professional league organization's website and studying the lists of all teams present in the 2019-2020 season. On the other hand, to validate the information, other library references including magazines, creditable domestic websites, such as websites of those clubs with

players, the Islamic Republic of Iran's Football Federation's official website, were used. Furthermore, to collect information on some foreign players employed in this league, the creditable transfer market's website was used and the data was prepared for statistical operations. In this regard, to obtaining the predictive index for the average age, the information of each player for five consecutive seasons was collected from the above-mentioned references. There are a total of fifteen factors affecting the market value of the football players, which were organized into three categories. Further, to obtain some physiological indices such as players' dominant foot and height, the recorded information in the

Iranian Football Medical Assessment and Research Center's (IFMARC) standard forms were used. In this study, to collect data from creditable sources, all phenomena related to this research were investigated and identified by the researcher, and finally, the data necessary for conducting final research processes were collected. For data analysis in the descriptive statistics section, data analysis was conducted using central indices such as median, mean, and standard deviation distribution indices, skewness, and distortion. Further, the inferential analysis of data was done through the multi-regression method, and for calculating and processing variables the Eviews Ver. 8 software was used.

Results

Before analyzing and examining hypotheses, the reliability of variables was investigated. The reliability of research variables means that the mean and variance of research variables were fixed during different years. Consequently, using these variables in the model wouldn't lead to false regression. In other words, before estimating models and testing research hypotheses, the reliability of variables must be studied. The presence of unreliable variables in the model will cause the tests to lack the necessary authenticity, and that the critical quantities offered by the aforementioned distributions, would not be the correct values for statistical tests. The reliability test was performed using the Levin, Lin & Chu tests (2002). Based on the information provided in the table (1), the specifications of the interviews' participants along with the number of articles used for extracting significant concepts have been presented.

Table 1. Unit Root Test for Variables

Variables	Levin, lin	PV
Age	-72.8	0.001
Number of Goals	-1.85	0.002
Number of National Games	-4.17	0.001
Height	26.48	0.001
Goals' Ratio	16.19	0.001
Number of Games	41.28	0.001
Game Minutes	53.21	0.001
Goalie Position	25.05	0.001
Defense Position	48.11	0.001
Midfielder Position	32.96	0.001
Forward Position	17.83	0.002
Personal Rewards	19.03	0.001
Foot's Condition	42.03	0.001
Team's Level	52.46	0.001
Awards	41.67	0.001
Price	38.94	0.001

The results for variables' test shows that the error level of all variables is less than 5% and as a result, the research variables are reliable; therefore, the null hypothesis regarding variables having a unit root is rejected, and using these variables for estimating research models will not cause false regression.

Table 2. Regression Model Test

Variables	Beta	t statistic	Sig
Intercept	-1.76	-5.79	0.000
Age	0.07	3.27	0.001
Goalie Position	-.012	-3.24	0.001
Defense Position	-	-	-
Midfielder Position	-0.02	-3.02	0.004
Forward Position	-0.06	-3.46	0.001
Number of Goals	1.22	1.33	0.606
Number of National Games	0.98	1.32	0.610
Personal Rewards	0.83	3.12	0.001
Foot's Condition	0.026	5.16	0.0001
Height	1.01	1.81	0.076
Team's Level	1.03	1.01	0.845
Goal's Ratio	0.99	0.093	0.347
Team's Rewards	0.67	1.98	0.561
Number of Games	0.55	3.45	0.0001
Game Minutes	0.0.34	1.29	0.471
R Square	0.48	Adjusted R	0.46
F Statistic	73.95	Sig	0.001

In the table (3), the intercept alpha of the regression equation is shown. The regression coefficient of (*b*) consists of the regression of the line's slope and the regression equation is: $y = b_0 + b_1 x_1 + b_2 x_2 + ... + b_k x_k$.   The regression coefficient of (*b*) indicates the level of effect of one variable on *y*. The beta coefficient of the research's regression model equals 1.76 and shows that for variation in independent variables, the dependent variable varies at the same level.

In this research, there are four artificial variables (goalie, defense, midfielder, and forward positions), which simultaneously evaluate a player's position. One of these variables must be eliminated from the model. These findings show that there is a significant relationship between the goalie position, midfielder position, forward position, players' personal rewards, number of games, number of national games, and players' foot condition with players' valuation. There is no significant relation between players' height, team's level, goals' ratio, team rewards, and game's minutes with players' valuation.
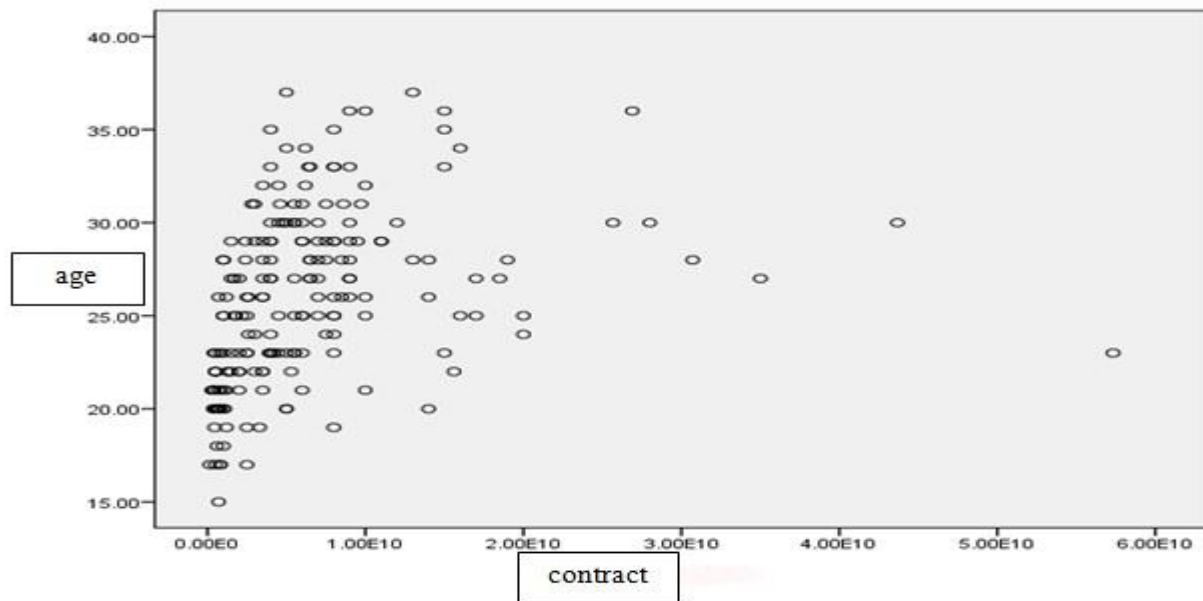
Figure (1) Age and Contract Relation Graph

According to the results, the t-statistic and p-Value for this variable that 0.001, this coefficient is significant. These findings reveal that there is a significant relationship between the age and valuation of players.
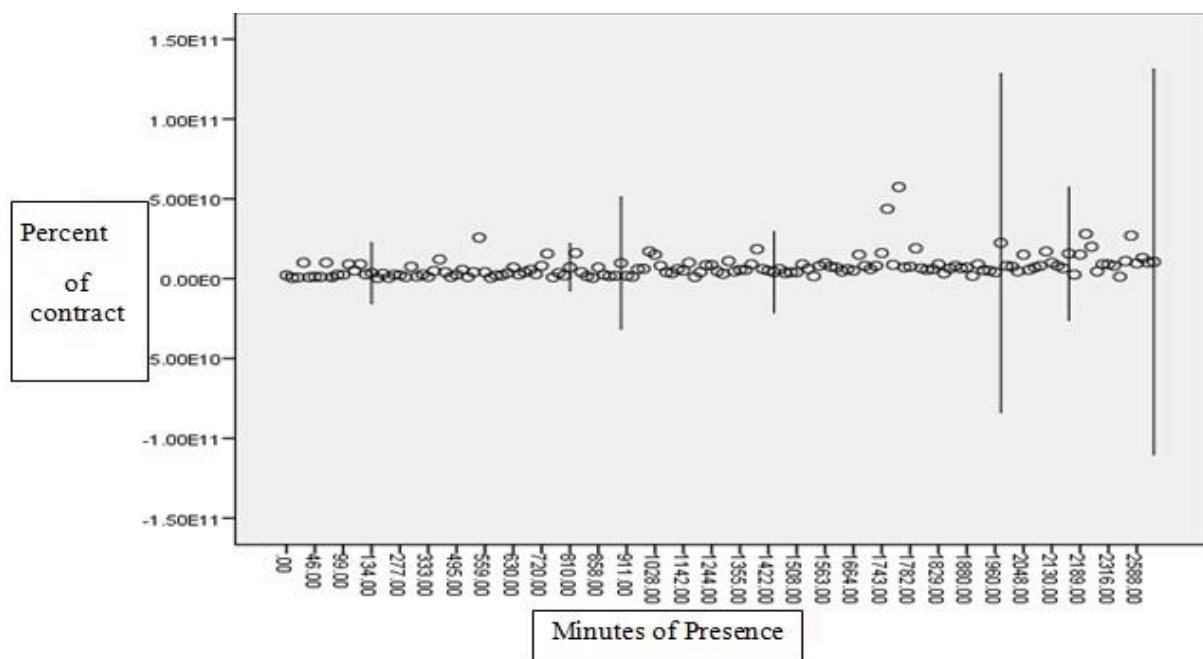

Figure (1) Age and Contract Relation Graph

Considering the results, the t-statistics and p-Value of this variable that is 0.001, this coefficient is significant. These findings indicate that there is a significant relationship between the players' game's minutes in the previous season and players' valuation.

Discussion

Based on the performed statistical operations and obtaining the research's descriptive findings it was observed that the mean age of players who were employed at the Iranian professional football league was 25.98 years old, the mean number of their goals was 1.21, the mean number of national games was 16056 minutes, the mean minutes played in the league was 1098.163, the mean number of games in the league was 14.612, the mean recorded goals was 66%, and the mean height was 181.79cm. In the present study, the mean age of players was 25.98 years old, therefore, it can be observed that compared with similar research conducted by Abdi et.al. (2015) in which the mean age of the football players was 27 years old, the studied players had a lower mean age in this study, and it can be concluded that during the years 2016 thru 2019, the mean age of players employed at the Iranian professional league has decreased by 1.02 years. This finding indicated the present teams in the Iranian professional football league's inclination towards youthfulness during these years, and this can be considered as one of the positive points of the clubs' performance in line with recruiting young players, and it can be stated that with such an approach, a promising future awaits for the Iranian national teams and the clubs owning the player during the future years.

However, it can be concluded that change in the teams' technical staff's method and inclination toward defensive methods and also the clubs and coaches' inclination towards maintaining games' results and fear of defeat can cause for the coaches to prioritize winning with the least number of goals and possessing the final result over a high number of scored goals and presenting an offensive game. On the other hand, when comparing the mean number of goals for the season 2014-2016, recorded as 1.96 in the research conducted by Abdi et.al. (2015), with the mean number of

scored goals during season 2019-2020 obtained from the results of this study which was equal to1.21 goals per game, it can be observed that the mean number of this variable was reduced by 0.75. More research is needed in order to describe the scientific reasoning behind this change. By studying the total mean of the 15 variables of this research, which were grouped into three categories of operational, technical, and personal, it was found that the mentioned variables are the characteristics of the performed activities of all players, which have been set in this research to obtain results and predetermined objectives by their relevant clubs. Therefore, this strategy can be directly observed throughout the research. Therefore, by the end, utilizing the conducted investigations and performing relevant statistical operations resulted in a statistical model for determining the market value of studied players. In the current study, one of the most important effective factors in determining the market values of football players was the age variable. Therefore, it can be stated that if clubs are aiming to decide regarding recruiting players with almost similar technical skills, their priority should be in recruiting younger players. By recruiting such players, on one hand, trading them later in the transfer market can help the club increase the profit of the final turnover, and on the other hand, they can also increase the time that they are able to use their sports services and skills in football for a number of years, and thus, conclude long-term contracts with them. However, it should be noted that the trade and value of this group of player's maybe have a higher mean price. In a study by Chan (2009) which was conducted for this purpose, it was indicated that players that are three years younger have a much higher price compared to older players. Furthermore, Abdi et.al. (2015) reached very similar results in a similar study conducted regarding identifying the role of effective factors in determining the price of football

players, which made the necessary validation for this matter. In Iran as a developing country, the use of all utilizable commercial and economic opportunities such as football is an undeniable necessity. Furthermore, improvement of the financial and economic supply for the premier league of professional football is the cause for development and improvement of championship status. Personal experience and characteristics were stated as the effective factors on the players' valuation and appraisal. It seems that as the player gets older, their experience will also increase, or that a younger player gain a good amount of experience due to their many games played in younger age groups, which can also be consistent with the findings of the present study. Further, Depken & Rajasekhar (2010) also stated age as one of the factors for players' valuation, which is consistent with the present research. Furthermore, He (2012) in a study indicated age as one of the factors in data collection to determine the market value of players. Market value refers to the price assigned to each player in the football players' trading market. Many factors were involve in the market value determination of a football player, one of the most important of which is the player's age. Nowadays, prominent clubs around the world have codified policies for recruiting younger players, in such a manner that these clubs identify talented adolescent and very young players, and by recruiting and empowering them, their club benefits from these players for many years. Other factors such as the number of national games, number of scored goals, level of the player's previous team, and the number of games in the next season are also among the effective factors in pricing players. The presence of the player in national teams' levels, including adolescents, young adults, U21, and adult national teams, all of which were considered in this research, seems to be a great indicator of the player's ability and competence, and the player that has been able to achieve such a position is more capable compared to other players. Furthermore, the ability to score goals and the number of score goals by a player can also be considered as one of the effective factors on players' price.

Players in different positions of a game have different performances in scoring goals, in such a manner that a forward's conditions for scoring a goal are much better than a defense position, and it is also expected from a forward to score more goals during a season. However, if the players of other positions score goals, they will have a much higher value compared a player of the same position who didn't score a goal and somewhat the score goal creates value for a player. Yuan He (2014) stated factors such as the player's previous team's level and also the number of goals scored by the player as part of performance information, and used them for predicting players' value, which is consistent with the present study. The player's previous team's level is also discussed as another effective factor on the player's price. It seems that a player that plays in high ranked and prominent teams has a higher price compared to a player who had played in lower level teams. The number of games in the next season can somewhat be an indicator of the player being a key and competent member of the team. Assuredly, clubs will use players during a season who could present the best performance for the team and would take their club and team towards the pre-planned goals. Otherwise, players in the same position will take their part in the starting lineup for the team. Jarsat Shamsabdi (2010) in part of his model studied the relation between the players' operational data with the team's victory rate, where the players' operational data included the items that were mentioned above.

Izadyaret.al. (2015) in a related study, concluded that factors used for determining players' price in Iran's football include physical

readiness, social acceptability, club's brand and other variables mentioned as effective elements and factors throughout their study. Every year large sums of cash flow and money are exchanged in the cycle of transferring players in different leagues around the world especially European leagues, and due to different reasons, achieving an appropriate economic appraisal for players' transfer during a year is very important and valuable. For example, the players' performance during a season is significantly dependent on the value of these players in the transfer market.

Conclusion

Overall, it can be acknowledged that to improve the sports industry and commercialize it, the chosen grounds must be applied as developmental policies. In fact, paying attention to cultural factors, organizational factors, social factors, legal factors, and structural factors can lead to the stable commercialization of sports. Therefore, it is recommended to the country's higher sport authorities focus on this research's findings. Finally, to complete the studies about business in sports the following suggestions are made: the football federation should train clubs' managers to the income-generating and spending methods at prominent clubs in the world; the hardware and software design infrastructures for developing a sports commercialization model should be first created by the government and institutes responsible for sports. According to the conducted studies in this research, it is suggested that the factors affecting the valuation of the Iranian premier football league's players include foreign players' nationality, the popularity of Iranian football players, and finally, personal skills, should be investigated by valuation of relevant models. According to the effectiveness of social networks, especially Instagram, in creating a relation between the players' value and their established popularity and their relation with the increase in the

player's market value, future studies should be carried out regarding these effects. Since the data used in these studies include the hierarchal players' date inside their respective teams and these teams are active within a league and since the teams have their own longitudinal and temporal structures and players might be employed in the leagues for several consecutive seasons, future studies should investigate changes in players' values and the factors affecting these changes and various valuation methods. In the future, researchers in the future for assessing the market value of the Iranian professional football league's players since the data obtained from this type of researches is hierarchal, players are within teams and teams are active within a league and on the other hand, it has a longitudinal and temporal structure, the players are employed at leagues throughout consecutive seasons. Researches should be done regarding the conducted changes in their value level and the effective variables in line with conducted changes on the manner of valuation.

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