

# The construction and validation of a scale for the evaluation of the capitals of Volleyball clubs in Iran

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## ABSTRACT

The purpose of the present study was to construct and validate a scale to determine the economic value of volleyball clubs in Iran. The statistical population of the study consisted of two qualitative sections including faculty members and managers (47 people). In the quantitative section, they included faculty members of sport and economics management, athletes, coaches, managers and experts and knowledgeable experts on economic valuation (N=400 people). Based on Morgan Table and through stratified-random sampling 196 participants were selected for the study. Regarding the fact that some of the questionnaires may be filled incompletely, 300 questionnaires were distributed and finally 234 questionnaires were analyzed. The questionnaire included 76 items concerned with the criteria for the evaluation of volleyball clubs and it included factors like human capital, communication capital, structural capital, and moral capital using a likert scale. Professors specializing in sports management and economics confirmed the face validity and content validity of the questionnaire. Descriptive statistics, Cronbach Alpha, Bartlett test, and confirmatory factor analysis were used to describe the data, determine reliability, specify the adequacy of the sample and determine the validity of the instrument respectively. The results showed that the scale enjoyed a reliability of 0.966. Also, confirmatory factor analysis showed that there was a significant relationship between the questionnaire items and the factors. In addition the goodness of fit indices were as follows:  $\chi^2/df=0.891$ , RMSEA=0.021, NFI=0.988, AGFI=0.982, GFI=0.990, IFI=0.989, CFI=0.990. Totally, the results showed that all the factors were good Predictors of the economic evaluation of the capitals of volleyball clubs and the internal and external validity of the instrument were confirmed.

**Keywords:** economic evaluation, capital, scale construction, volleyball clubs, factor analysis.

## Introduction

In order to determine the economic valuation tool of a club, the term value and the types of values found in the community should be firstly examined. The term value, like many sociological terms, has many meanings, but many sociologists and ethnologists agree that value is the ultimate outcome of the goals and purposes of social actions. In other words, the value is

the ability of an object (thing, thought, or person) to meet a desire, need, and will of human beings. Hence, the foundation of value should be sought in human thought, which evaluates the benefit (of value) of an external object. In other words, values determine the way of performing, the course of activities, and the way of prioritizing the goals in the cultural, educational, family, political, and religious systems of each community [1]. In this regard, one of the first and most important classifications is the classification of values based on the value questionnaire developed by Allport, Vernon and Lindzey (1970), inspired by the writings of Spranger (1928) in order to assess the six main areas of essential interests and motivations in an individual's life. It includes theoretical values, political values, art values, social values, religious values and, economic values. The economic value is an amount expressed in terms of money payable in return for the acquisition of an asset or rights arising from future interests through the use of an

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asset. Thus, the economic value of each asset is its monetary value <sup>[2-4]</sup>.

For valuating organizations, clubs and assets, one of these four methods can be used:

1. Valuation based on the assets
2. Valuation based on cash flow reduction, that reduces cash flows to reach the stock or company value
3. Relative value methods, which are the basis for valuation in these coefficients.
4. The method of pricing options which involves the valuation of potential claims <sup>[5]</sup>

In this regard, for the first time, Munasinghe (1993) divided the total economic value into two main branches - use and non-use values <sup>[6]</sup>. Here, he also divided non-use values into two groups: existential and legacy values where the use value includes direct, indirect, and selective use values. Thus, economic valuation is a process in which the current cost of an asset is determined. The most obvious form of asset is the tangible asset (market or use), such as buildings and office equipment and supplies, which are assets with physical form and nature. Assets may be as intangible assets. Such assets in an economic unit include all assets with no physical nature but with significant benefits for the success of the economic entity <sup>[7]</sup>. Intangible assets (non-market and non-use) of organizations (capability created by competency and knowledge sources) are among corporate structure, employee specialized skills, innovation capability, customer size, brand, recognition, and market share that show the opportunities for future growth and profitability of the organizations. Many studies have been conducted regarding economic valuation models, of which Edvinsson (1993) can be cited, dividing market value into two parts - the book value and intangible assets (human capital and structural capital) <sup>[8]</sup>. Brooking (1996) divided the intangible assets of an organization into four parts: human capital and sub-structural capital, intellectual property, and market capitals <sup>[9]</sup>. Human-based assets are the skills, capabilities, expertise, chart-solving capabilities, and leadership styles. Sub-structural assets mean all technologies, processes, and methodologies enabling an organization; and intellectual property is the franchise, brands of trade and technical knowledge, meaning market capital, customers, loyalty of customers and distribution channels. Roos *et al.* (1997) divided intangible assets into three parts: human capital, structural capital, and communicative capital <sup>[10]</sup>. Human capital: includes technical knowledge, skills, and leadership attributes of senior executives, innovations, motivation (financial and non-financial aspects) and compatibility. Structural capital is the corporate culture, structure, processes, and working procedures. Communicative assets are the customers, their satisfaction with products and services, number of customers, and communication with suppliers (being aware of these communications). Bontis (2002) <sup>[11]</sup> has divided the assets into four parts: human capital (learning and education, experience and expertise, creativity and innovation), structural capital (systems and programs, R & D, intellectual property rights), communication capital (strategies

and expectations, relationship with the customer, suppliers and the customer, and acquisition of knowledge about the customer). The last aspect in his division was intellectual asset or property (profitability, profitability, and value in the market).

Chen *et al.* (2004) divided the assets of an organization into four parts (human capital, customer capital, innovation capital, and structural capital) <sup>[12]</sup>. Jurczak (2008) divided the assets into human, organizational and communicational capital <sup>[13]</sup>. Human capital involves knowledge, competency, attitude and mental issues; organizational capital is derived from intellectual, structural, commercial, market and developmental assets; and the communication capital includes customers, owners, investors, employees, distributors and manufacturers. Lopez (2009) considers the assets of an organization to have two main factors - communication capital (customer) and structural capital, two of which are objective knowledge and implicit knowledge <sup>[14]</sup>. Chen (2012) divides these assets into three types of structural capital, communicative capital, and human capital, whose value will vary with changes in the economic environment <sup>[15]</sup>. In a study entitled "The value of olympic achievements and the effects of the intangible assets of sport events in Germany," Wicker *et al.* (2012) showed that intangible assets by athletes create pride, national unity, satisfaction with performance, national reputation, happiness, honor, high performance in society. They also contribute to raising motivation, promotion of justice, as well as willingness to pay for teams and sports clubs. Kapyla *et al.* (2012) and Salonijs & Lonnqvist (2012) have divided the assets of an organization into four parts of human capital, spiritual capital, structural capital, and communicative capital <sup>[16, 17]</sup>. In a study entitled "Measuring intangible assets of Turkish soccer clubs," Pinar Gurel *et al.* (2013) <sup>[18]</sup> divided the intangible assets of the Turkish Premier League Clubs into three categories of human capital (individual skills such as talent, experience, knowledge, the merit of the employees and managers, motivation, knowledge and skills) structural capital (organizational structure, strategies, operational plans, information-transformation hardware and software and corporate culture) and communication capital or customer capital (club relationships with each other, relationships with sponsors and financial suppliers, relations with fans, and media relations). Zhang *et al.* (2013) divided assets into three parts: human capital, spiritual, and commerce <sup>[19]</sup>. In a study entitled "Personal well-being and intangible assets of the coaches of soccer clubs," Tomé *et al.* (2014) <sup>[20]</sup> divided clubs assets into three categories of human capital or assets (the merit of club members as a source of productivity, quality, loyalty, individual skills and knowledge), structural capital (administrative infrastructure, databases, organizational knowledge, intellectual property), and communication capital (international relations of the club, image, relationships with external stakeholders, and the image of the club in the mass media). They also showed that for evaluating a coach the difference of the status of the team in the national league during the year, the status of the team in the competition table during the year, his image in the media, his

personal history, being a former footballer, having sports activity in the team currently coaching, the championships won with the present team in the previous years, the quality of the team's play, and the age of the individual should be considered. Additionally, the paper states that the most important factor affecting the price of coaches is nothing but their communication capital.

In a study entitled "Intellectual capital (intangible assets) and profitability in European football clubs," Dimitropoulos & Koumanakos (2015) concluded a positive and significant relationship between intangible assets and profitability of clubs. It should be noted that the intangible assets used in this study are organizational, human and communicative capital. In a study entitled "Intellectual capital and business performance in professional soccer societies: Evidence from a longitudinal analysis," Ricci *et al.* (2015) concluded that the intangible assets of sports clubs (structural / communications and human capital) are effectively and positively correlated with sport performance in clubs. In a study titled "A comparative study of national property measurement models," Macerinskiene & Aleknavičiutė (2015) concluded a large overlap between the assets of organizations in different countries, and these dimensions have differed among the studies in four and nine aspects, depending on the environment of different communities<sup>[21]</sup>. In a study titled "The development and use of intangible assets of sports in China with an emphasis on sustainable development," Shou & Liu (2015) concluded that intangible sport assets, due to government constraints in the country, are the acquisition of social credit for Chinese sports products companies from international sports events, brand naming rights, television broadcasting rights, respect for the society, and the adoption of sports products through the promotion of sports stars. Gudaitė *et al.* (2016) examined the criteria for assessing the sports event legacy (current share in the future) at the European Basketball Championship from 2007 to 2013<sup>[22]</sup>. They used the direct (infrastructure, sponsors, tourists and return on investment) and indirect values (social and spiritual capital as well as communications) to value these events. In a study titled "A framework for measuring intangible assets," Baldini *et al.* (2017) divided the assets of an organization into three types<sup>[23]</sup>. One of them was communication capital (market share, the number of customers, sales returns, sales percentage, corporate image, customer trust, contracts, cooperation with other organizations, communication from the virtual spaces (human capital). The other one was the human capital (the number of employees, staff age, employee experience, employee record, employee education, staff satisfaction, cooperation with specialist staff, employee motivation, employee training) and organizational capital (Organizational growth index, patenting inventions, licensing, the number of brands, employee benefits, investing in the information systems, organizational innovation, and research costs). In their study entitled "What effects social networks have on the assets of football clubs," Lardo *et al.* (2017) concluded that popularity criteria in social media are a determinant factor in the value of human and communication

capitals in professional football clubs<sup>[24]</sup>. The study divided the components of a club's assets into three parts: structural, human and communication capital. In a study entitled "Identifying the intangible assets of the educational sector in Iran," Bakhsha *et al.* (2018)<sup>[25]</sup> concluded that the assets of an organization includes three components, the first one of which is communication capital (brand value, relationship with suppliers and competitors, customer satisfaction, communication with other organizations, marketing capability, customer loyalty and intensity of market competition). The other ones are structural capital (culture, organizational structure, organizational learning, access to new systems and information systems) and human capital (employee experience, motivation, creativity, attitude and competence). The conclusion of the above studies shows that several studies have been conducted on the economic valuation of intangible assets in non-sport organizations. However, a comprehensive study in sports organizations, especially in Iranian sports clubs is not done and it has not been determined what indices are needed by sport clubs at different levels of sport for the valuation of their intangible assets. In other words, there is no efficient model in this area according to the conditions of each country. On the other hand, according to the authors, the main cause of the failure or poor success of Iranian sports clubs in the past decades, besides issues related to players and coaches and lack of facilities, is the absence of a model for the economic valuation of the intangible assets of Iranian volleyball clubs. This is necessary for being transferred to the private sector, which is a topic that despite its great importance is still ignored by authorities.

The attention of researchers to the economic valuation of intangible assets has been shaped by the observation of the many problems encountered in the transfer of sports clubs to the private sector and the numerous discussions in academic and executive circles. According to the researchers, having a proper model for the economic valuation of the intangible assets of Iranian volleyball clubs can provide the context and the structure required for the success of Iranian sport in the domestic and foreign arena. However, the full realization of the concept of economic valuation, especially in the intangible asset sector, may be an ideal issue in practice that cannot be achieved; having an appropriate model paves the grounds for this. Therefore, the present study was conducted with the aim of constructing and validating a tool for the economic valuation of Iranian volleyball clubs' assets. It is expected that the results of the present study and the developed tool based on its results could be used as a measuring and controlling tool for valuation of the assets of volleyball clubs in Iran.

## Methodology

The objective of this study was to construct and validate a tool for economic valuation of tangible and intangible assets of Iranian volleyball clubs. In order to achieve the dimensions and indicators of the tangible and intangible assets of Iranian

volleyball clubs, the mixed method (qualitative-quantitative) was used. The research population in the qualitative section included faculty members of sport and economics management, athletes, coaches, managers and experts, who had knowledge on the subject of economic valuation of volleyball clubs in Iran (n=47). Snowball sampling method was used in the qualitative section. In the qualitative section of the research, after defining the research question, the researcher first reviewed the studies carried out in this area. Then, he purposely selected the samples using snowball sampling method among faculty members of sport management and economics, athletes, coaches, managers and experts, who had knowledge on the subject of economic valuation. The selection of the samples continued until the information saturation stage (until the time that the researcher did not provide new information about the intangible assets of the Iranian volleyball clubs or the indicators proposed by the faculty of sports management and economics, athletes, coaches, managers and experts, who had knowledge on the subject of economic valuation were identical and repetitive). Finally, deep interview was performed on 35 subjects selected in person (non-structured) and notes were taken from the intangible asset components of Iranian volleyball clubs in each dimension of communication capital, spiritual capital, human capital, and structural capital. It should be noted that the interviewer's position was in a participatory manner in interview conditions. As the texts of the interviews were analyzed with three quantitative, structural and interpretative methods, a structural method was used to classify the components in the present study. Accordingly, the researchers read the text of the interviews several times and specified the terms, phrases, and themes of the text. Additionally, for more validity, interviews were not sufficient, thus, the researcher reviewed academic books and numerous scientific articles and selected a list of the most important variables affecting the economic valuation of sports clubs, especially volleyball clubs. They were selected among the scientific documentation such as the books, articles, and websites and valid scientific databases (98 indicators). After extracting these indicators and obtaining the opinion of the experts (15 professors of sports management and economics) on the face and content validity of the questionnaire and applying the reforms needed (overlap of some questions and the integration of some questions), the questionnaire with 98 indicators was revised to a questionnaire with 76 indicators based on the economic valuation of volleyball clubs in Iran to be tested in a quantitative section of the questionnaire. The research population in the quantitative section included 400 faculty members of sports and economics management, athletes and coaches with a history of over 5 years in the Premier League, managers of volleyball clubs and sports experts who had knowledge on the subject of economic valuation of

volleyball clubs' assets. In this research, random, stratified and purposeful sampling was used. A total of 196 samples were selected based on the Morgan table. Given the possibility of incomplete questionnaires, the questionnaires were distributed among 300 subjects. Finally, 275 questionnaires were returned, out of which, 234 questionnaires (faculty members = 45, coaches = 42, athletes = 46, managers = 12 and experts = 89) were selected for statistical analysis. In a pilot study, the reliability of the questionnaire was assessed using the Cronbach's alpha coefficient and it was found  $\alpha = 0.963$ . To report the construct reliability of the questionnaire, a confirmatory factor analysis was used. Based on the results, 76 indicators finalized in the qualitative section were approved in the quantitative section. In the intangible assets section, 18 indicators were in the structural dimension, 14 indicators were in the spiritual dimension, 19 indicators were in the communication dimension, and 8 indicators were in the human dimension. Moreover, 17 indicators were obtained in the tangible assets section. It should be noted that all questions were prepared based on the five-point Likert scale (one: very low value, two: low value, three: moderate value, four: valuable, five: very valuable). Finally, SPSS and Amos22 software were used to analyze the data. The raw data obtained from the questionnaires were evaluated using descriptive statistics such as frequency and percentage of frequency. To analyze the relationships between the indicators and identify the indicators related to each factor, exploratory factor analysis and first order and second order confirmatory factor analysis were used.

## Results

The results showed that the mean age of 234 participants in the study was 33.84 years, out of which 40 had bachelor degrees (17.1%), 77 had master degrees (32.9%), and 117 (50%) had Ph.D. degree. In Table 1, descriptive indicators of the economic valuation of the assets of sports clubs have been reported separately. Based on the results, the mean and standard deviation of the economic valuation scale were equal to 4.22 and 0.40, respectively. Moreover, the mean and standard deviation of the component of spiritual capital were equal to 4.18 and 0.43, respectively, and the mean and standard deviation of the component of communication capital were equal to 4.28 and 0.49, respectively, the mean and standard deviation of the component of structural capital were equal to 4.13 and 0.44, respectively, the mean and standard deviation of the component of human capital were equal to 4.29 and 0.48, respectively, and the mean and standard deviation of the variables of tangible assets were 4.05 and 0.44, respectively.

**Table 1- Descriptive information of research variables**

Components	n	min	max	median	mean	SD	Mean standard error
Intangible assets							
Spiritual capital	234	77.2	00.5	35.4	18.4	43.0	02.0

Communication capital	234	89.2	00.5	36.4	28.4	49.0	03.0
Structural capital	234	22.2	00.5	08.4	13.4	44.0	03.0
Human capital	234	00.2	00.5	25.4	29.4	48.0	03.0
Tangible assets	234	50.2	00.5	08.4	05.4	44.0	02.0
Total	234	85.2	97.4	28.4	22.4	40.0	02.0

Reliability of the present study was calculated using Cronbach's alpha coefficient. The results of analysis of the reliability of the final tool showed that the Cronbach's alpha coefficient for the tool for economic value of the Iranian volleyball clubs assets was  $\alpha = 0.966$ . The results also showed that Cronbach's alpha coefficient on the reliability of structural capital valuation components, spiritual capital, communication capital and human capital and tangible assets was 0.901, 0.859, 0.926, 0.839, and 0.810. In order to examine the appropriateness of the data, KMO factor analysis was used.

**Table 2. Bartlett and KMO test results**

Economic evaluation	Results of KMO	Bartlett Sphericity test results		
		Chi-square	df	Significance
Structural capital	815.0	524.5644	630	001.0
Spiritual capital	817.0	753.1312	78	001.0
Communication capital	867.0	413.2894	171	001.0
Human capital	843.0	768.656	28	001.0

tangible assets	845.0	819.2671	192	001.0
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The results of Table 2 showed that the significance number of KMO for all the components of the economic valuation of Iranian volleyball clubs was greater than 0.7, so it can be stated that the data were appropriate for factor analysis. Moreover, to ensure that the data were appropriate (the matrix of correlations used as a basis of the analysis is not zero in the population), Bartlett test was used. The results of Table 2 indicated the adequacy of sampling, because the significance number of Bartlett test was less than 0.05.

It should be noted that the implementation of factor analysis also required examining the commonality of each of the questions with the whole tool. Generally, the results showed that all values related to the correlation of the questions with the whole test to analyze the main components were above 0.3, indicating a high correlation between each of the indicators and the whole test and its appropriateness for factor analysis.

**Table 3- Commonality of each of indicators or questions with whole tool**

question	Alpha coefficient	question	Alpha coefficient	question	Alpha coefficient
1	50.0	27	53.0	53	43.0
2	65.0	28	44.0	54	41.0
3	49.0	29	73.0	55	73.0
4	55.0	30	41.0	56	76.0
5	51.0	31	60.0	57	51.0
6	53.0	32	63.0	58	65.0
7	63.0	33	53.0	59	44.0
8	44.0	34	43.0	60	46.0
9	86.0	35	43.0	61	64.0
10	64.0	36	79.0	62	61.0
11	68.0	37	76.0	63	37.0
12	55.0	38	66.0	64	51.0
13	49.0	39	51.0	65	50.0
14	47.0	40	42.0	66	66.0
15	77.0	41	44.0	67	51.0
16	66.0	42	57.0	68	43.0
17	42.0	43	54.0	69	69.0
18	81.0	44	64.0	70	46.0
19	41.0	45	43.0	71	82.0
20	72.0	46	81.0	72	62.0
21	51.0	47	78.0	73	57.0
22	58.0	48	51.0	74	53.0
23	65.0	49	55.0	75	76.0
24	81.0	50	46.0	76	48.0
25	73.0	51	52.0		

26                      61.0                      52                      86.0

The results of the confirmatory factor analysis of each of the variables were obtained by Amos software. These results are shown in Table 4. It should be noted that in order to reduce the variables and consider them as one variable, the obtained factor load should be greater than (0.4). The total of these six factors

explained 67.17% of the variance in the assets of Iranian volleyball clubs, whose factor loads varied from 0.46 to 0.83. It should be noted that the number of questions in Table 3 corresponded to the number of questions in Table 4.

**Table 4- First order confirmatory factor analysis of indicators of economic valuation of Iranian Volleyball clubs**

components	Number of question	Indicators	Factor load	Square of multiple correlation	T	Variance explained
Structural capital	1	Development document (vision, mission, etc.)	52.0	36.0	41.6	82.11
	2	Having effective management	53.0	38.0	66.5	
	3	Club Organizational Culture	51.0	32.0	62.5	
	4	Financial transparency in the club	55.0	46.0	19.6	
	5	Leadership style of club managers	46.0	38.0	89.5	
	6	club development plan and research	69.0	42.0	88.7	
	7	applying electronic packages and systems	54.0	41.0	74.6	
	8	Quota for presence in Professional League	55.0	34.0	99.4	
	9	Technical quality of the club	61.0	45.0	36.6	
	10	The geographical location of the club	50.0	31.0	32.5	
	11	Publications	60.0	44.0	20.6	
	12	Standardization of the club compared to other international clubs	69.0	49.0	23.7	
	13	Efficiency and productivity of the club	62.0	46.0	52.7	
	14	Club stock	57.0	42.0	06.8	
	15	Safety of club	54.0	41.0	75.7	
	16	Quality of the owners and shareholders of the club	58.0	43.0	63.7	
	17	Have a coherent and efficient evaluation programs in the club	62.0	49.0	96.7	
	18	Quantity of the owners and shareholders	65.0	46.0	88.7	

**Continuation of table 4**

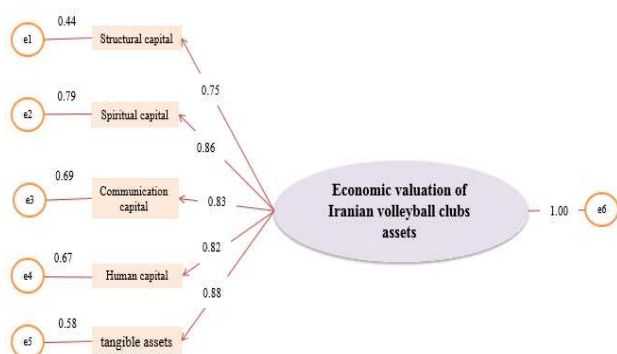
Component	Number of question	Indicators	Factor load	Square of multiple regression	T	Variance explained
Spiritual capital	19	Club ownership rights	64.0	45.0	54.7	61.9
	20	Broadcasting rights (television, radio, satellite, ...)	69.0	50.0	79.6	
	21	Membership of club representatives (coaches, players) in relevant international organizations (FIVB, AVC, ...)	55.0	41.0	78.7	
	22	Urban and Industrial Services Fees	52.0	40.0	63.6	
	23	Club reputation	66.0	45.0	53.7	
	24	National reputation of players	81.0	0/65	6/35	
	25	The honors won by the club	69.0	55.0	56.7	
	26	Club Ranking (national and international)	61.0	53.0	91.6	
	27	The right to participate in national and international competitions and events	60.0	52.0	81.6	
	28	Stock value compared to competitors in the market	57.0	43.0	41.7	
	29	Club accomplishments	76.0	58.0	27.6	
	30	Social capital	53.0	40.0	56.6	
	31	Permits and licenses	55.0	41.0	08.7	
	32	Date or history of the club	49.0	35.0	78.5	

Continuation of Table 4							
Component	Number of question	Indicators	Factor load	Square of multiple regression	T	Variance explained	
Communication capital	33	License for importing sporting goods (balls and shoes and clothing, etc.)	47.0	36.0	74.7	44.13	
	34	Reputation (players and staff)	69.0	53.0	65.6		
	35	Organizational Agility	58.0	46.0	35.8		
	36	Competitive Advantage	65.0	52.0	10.7		
	37	Creating a sense of confidence in society	52.0	43.0	79.6		
	38	Formal and informal communication	42.0	38.0	69.7		
	39	Fans' satisfaction with club's trophies and position	58.0	39.0	37.10		
	40	Communication with fans	47.0	40.0	91.8		
	41	communication with investors and partners	65.0	52.0	09.8		
	42	Loyalty of fans	78.0	60.0	09.8		
	43	The popularity of a club	75.0	58.0	36.7		
	44	Brand personality of a club	72.0	54.0	87.9		
	45	Knowledge on a club brand	68.0	50.0	76.5		
	46	The quality perceived by fans of a club	74.0	54.0	96.		
	47	Brand association with fans	62.0	45.0	74.4		
	48	Social image of club	61.0	44.0	58.7		
	49	Taking the critics of team fans and supporters into account	83.0	65.0	05.6		
	50	Identity of a club	57.0	44.0	85.3		
	51	Advertising	71.0	55.0	28.4		
	52	Number of fans	64.0	51.0	10.4		
	53	Finding the talented people in volleyball by club (meritocracy)	58.0	49.0	24.4		
	54	Management of contracts	69.0	54.0	00.4		
	55	Improvement and training of human resources (managers, coaches, players, ...)	57.0	48.0	74.3		
	Human capital	56	Club pioneers	66.0	53.0	11.4	12.15
		57	The number of national players employed in the club	65.0	52.0	86.3	
		58	The reputation of human resources at the national and international levels (individual skills and values)	56.0	43.0	24.4	
		59	Education level of technical staff	54.0	40.	39.4	

Rest of Table 4						
Component	Number of question	Indicators	Factor load	Square of multiple regression	T	Variance explained
Tangible assets	60	Public supports	47.0	42.0	34.4	18.17
	61	Quasi-government supports	56.0	37.0	30.4	
	62	Club transportation	54.0	39.0	29.4	
	63	Ticket sales	52.0	40.0	37.4	
	64	Stores covered by club	59.0	44.0	17.4	
	65	Government budget of a club	51.0	41.0	17.4	
	66	Contracts of players' transfers	51.0	36.0	41.4	
	67	Having an exclusive hotel	58.0	42.0	10.4	
	68	Have a volleyball school	67.0	45.0	34.4	
	69	Contracts (short-term and long-term)	64.0	47.0	89.6	
	70	Having up-to-date training equipment	60.0	44.0	32.6	
	71	Having a sports museum in the club	70.0	52.0	94.6	

72	Having an exclusive field	67.0	46.0	33.6
73	Administrative office of a club	65.0	44.0	87.6
74	Future investments of the club in order to earn money	70.0	55.0	90.6
75	Liquidity of a club	48.0	30.0	85.6
76	Having an office building in different parts of the city	62.0	48.0	18.6

Figure 1 showed that in the economic valuation of Iranian volleyball clubs, tangible assets with factor load (0.88), spiritual capital with factor load (0.86), communication capital with factor load (0.83) and human capital with factor load (0.82) and structural capital with factor load (0.75), respectively, had the effects. Hence, as none of the factor loads of the economic valuation variable was less than (0.3), all of them were kept in the questionnaire.



Chi-square= 0.977,  $d.f = 4$ ,  $p\text{-value} = 0.001$ ,  $RMSEA = 0.038$

**Figure 1** – The model for estimating standard regression coefficient (second order confirmatory factor analysis) of components of economic valuation of assets of Iranian volleyball clubs

As shown in Table 5, all indices were reported at desirable level, and the model had a relative fit with the data, which indicated that the indicators were in line with theoretical structure, and all the questions and factors could be kept in the questionnaire of economic valuation of Iranian volleyball clubs.

**Table 5-** Fit indices of confirmatory factor analysis model of economic valuation components regarding volleyball club assets

indices	CMIN/DF	GFI	AGFI	NFI	IFI	CFI	RMSEA
Second order fit	0.977	0.963	0.961	0.953	0.949	0.948	0.038

In Table 6, Pearson's correlation coefficients were firstly calculated between the variables of the study at the level of the sports' experts. Then, the significance of the correlation coefficients calculated in the population was tested, so T-test was used for testing the significance of the correlation. According to Table 6, the correlation coefficient between all the components of economic valuation was significant at 95% confidence level (significant correlations are specified with star mark). In this regard, the highest significant correlation was reported between tangible assets and the structural capital ( $r =$

0.745) and the lowest significant correlation coefficient was reported between structural capital and human capital ( $r = 0.437$ ). In general, it is observed that the level of correlation between the components was at desirable level.

**Table 6-** The correlation of components of the economic valuation regarding volleyball clubs' assets and their significance

Components	Structural capital	Spiritual capital	Communication capital	Human capital	Tangible assets
Structural capital	00.1				
Spiritual capital	516.*0	00.1			
Communication capital	598.*0	610.*0	00.1		
Human Capital	437.*0	486.*0	522.*0	00.1	
tangible assets	745.*0	526.*0	649.*0	681.*0	00.1

\* $p \leq 0.05$

## Discussion

Although the concept of economic valuation of tangible assets (market) and intangible assets (non-market) has been widely used in recent years in the economics area, especially in sport economy, the community of sports and organizational researchers in Iran has not provided similar definition of economic valuation in sport in the sector of market and non-market assets. Moreover, the issue of valuation of tangible and intangible assets in the sports clubs, especially volleyball clubs, has not been studied in Iran so far. Hence, a standard and valid tool that could properly measure the economic valuation of volleyball clubs was essential. Therefore, the present study was conducted with the aim of determining the validity and reliability of a tool developed for economic valuation of volleyball clubs.

As the base of any research is the use of valid and reliable tools and as interpretation and analysis of the results of the research depends on the validity of the tools used, researchers must be sure of the reliability of the tools [26]. The findings from the confirmatory factor analysis and validity of this study supported the economic valuation tool for volleyball clubs. The results of this study confirmed that this tool was a valid tool in sports area and sports researchers and managers in federations and other sports clubs can use it when evaluating sports clubs. This study had similarities and differences with previous studies. The results of this study and comparative comparisons showed that this study was consistent with the studies conducted by Brooking (1996) [9], Bontis (2002) [11], Chen et al (2004) [12], Kapyla (2012) but inconsistent with the studies conducted by Gudaityte et al. (2016) [22], Lardo et al (2016) [24], Zhang et al. (2013) [19], Chen (2012) [15], Lopez (2009), Jurczak (2008) [13]



and Edvinson (2013) in terms of the number of dimensions<sup>[8]</sup>. In terms of the indicators used in the study, it overlapped with the studies conducted by Sahebkar et al (2019)<sup>[28]</sup>, Bakhsha et al (2018)<sup>[26]</sup>, Ghorbani et al (2017)<sup>[27]</sup>, Kapyla (2012)<sup>[16]</sup>, Jurczak (2008)<sup>[13]</sup>, Chen et al (2004)<sup>[12]</sup>, Bontis (2002)<sup>[11]</sup>, Roos, et al (1997)<sup>[10]</sup>, and Brooking (1996)<sup>[9]</sup>. It should be noted that all studies carried out in this regard differed from the present study as they had not investigated the intangible assets in organizations and clubs simultaneously.

In the present study, the reliability of Iranian sports clubs' asset valuation tool was obtained ( $\alpha = 0.966$ ), which indicated a high internal consistency. The results also showed that Cronbach's alpha coefficient for structural capital components, spiritual capital, communication capital, human capital, and tangible assets was 0.901, 0.859, 0.926, 0.839, 0.810, respectively, indicating that the structural factor had the highest degree of stability. Therefore, it can be concluded that the internal coordination of the factors (over 0.7) was at the desirable level and the measurement error was at the lowest level. This result suggested that the tool for economic valuation of volleyball clubs to determine the tangible and intangible assets of volleyball clubs was a valid tool that could help researchers and managers of other sports fields in the economic valuation of sports clubs. It should be noted that similar factors have been evaluated in other studies. In this regard, Bakhsha et al. (2018) in a research on educational sector assets<sup>[25]</sup> reported the human capital factor as 0.891. In addition, with regard to the validity of the construct validity of tool and the predictive power of the questions, the results of T-value showed that all the questions could be a significant predictor of their factors, so questions confirmed the theoretical construct of the valuation tool. Hence, the T-value of the questions confirmed their validity.

Moreover, the results of the relationship between the indicators and factors showed that they were 18 indicators in the structural capital dimension, 14 indicators in the spiritual capital dimension, 19 indicators in the communication capital dimension, 8 indicators in the human capital dimension and 17 indicators and 17 indicators were related to tangible assets. In addition, investigating the relationship between the factors of the values of sports clubs and the economic valuation of volleyball clubs, it was observed that the factors of tangible assets with factor load (0.88), spiritual capital with factor load (0.86), communication capital with factor load (0.83), human capital with factor load (0.82) and structural capital with factor load (0.75), respectively, had an effect. Therefore, as none of the factor loads of the economic valuation variable was less than (0.3), all of them were kept in the questionnaire. Thus, it can be stated that the four factors could be good predictor for economic valuation of volleyball clubs tool. As a result, the internal and external validity of the tool was confirmed. In this regard, Hu and Bentler (1999) stated that fit multiple indices provided a comprehensive assessment of the model fit of a tool<sup>[29]</sup>. In this study, in testing the fit of economic valuation of volleyball clubs tool, CMIN/DF index was obtained 0.977,

RMSEA was obtained 0.038, NFI was obtained 0.953, AGFI was obtained 0.961, GFI was obtained 0.963, IFI was obtained 0.949, and CFI was obtained 0.948, so they confirmed the tool fit.

As a result, the tool used for economic valuation of tangible and intangible assets of volleyball clubs was appropriate in terms of fit indices and its fitness was confirmed. Given what was stated, the establishment of the economic valuation system of tangible and intangible assets in Iran's volleyball clubs required providing an appropriate cultural bed and the realization of a set of actions. Therefore, it is suggested that the indices identified in this research to be used as criteria for the economic valuation of assets of Iranian volleyball clubs in order to determine the real value of sports clubs. It should be noted that the valuation of a club based on its real value requires proper criteria, but sports clubs valuation system in Iran has been based on tangible assets since past to present time. Hence, in addition to paying attention to the value or tangible asset, it is necessary to pay attention to intangible assets of a club, as these assets are more important in pricing a club. It can be concluded that this tool is a multidimensional tool including human capital, structural capital, communication capital, and spiritual capital and its construct validity was confirmed. Therefore, it can be used in valuation of assets, especially intangible assets, of a sports club.

## Recommendations

It is recommended that this tool be tested by other researchers in other sports clubs in various sports fields and to be evaluated in other countries with different social and cultural backgrounds.

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