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## Factors associated to the market value of professional soccer players

## Factores asociados al valor de mercado de los futbolistas profesionales

## Fatores associados ao valor de mercado de jogadores profissionais de futebol

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### ABSTRACT

The objective of this study was analysed to the market value (MV) of professional soccer players from Top-5 European Soccer Leagues. An ANOVA analysed the effect of the independent variables on the MV of the soccer players, with  $p < 0.01$ . Soccer players from the Premier League (PL) showed greater MV compared to other leagues. Foreign soccer players showed greater MV compared to national soccer players. Soccer players between 21-30 years showed greater MV compared to those  $< 21$  and  $> 30$  years. Forward and midfielders showed greater MV compared to goalkeepers and backs. Soccer players that represented their countries at international matches showed greater MV compared to those that did not. The soccer players with a youth background formation in their clubs in the Premier League and La Liga showed greater MV compared to soccer players coming from other clubs. In conclusion, extrinsic factors affect the MV of soccer players. Research results may be useful to the sport managers in the selection of professional soccer players.

**Keywords:** Sport; Athletics; Performance; Youth Sport; Economic Impact.

### RESUMEN

El objetivo de este estudio fue analizar el valor de mercado (VM) de futbolistas profesionales de las 5 mejores ligas europeas de fútbol. Se analizó el efecto de las variables independientes sobre el VM de los futbolistas, mediante una ANOVA con un nivel de significación de  $p < 0.01$ . Los futbolistas de la Premier League (PL) mostraron mayor VM en comparación con los de otras ligas. Los futbolistas extranjeros mostraron mayor VM en comparación con los futbolistas nacionales. Los futbolistas entre 21-30 años mostraron mayor VM en comparación con los  $< 21$  y  $> 30$  años. Los delanteros y centrocampistas, mostraron mayor VM en comparación con los porteros y los laterales. Los futbolistas que representaron a sus países en partidos internacionales mostraron mayor VM en comparación con los que no lo hicieron. Los futbolistas de formación juvenil en clubes de la PL y La Liga (LL) mostraron mayor VM en

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comparación con los futbolistas de otros clubes. En conclusión, factores intrínsecos y extrínsecos afectan el VM de los futbolistas. Los resultados de esta investigación pueden ser útiles para los directores deportivos en el proceso de selección de futbolistas profesionales.

**Palabras clave:** Deporte; Deportistas; Rendimiento; Deportistas jóvenes; Impacto económico.

### RESUMO

O objetivo deste estudo foi analisar o valor de mercado (VM) de jogadores de futebol profissional das 5 melhores ligas europeias de futebol. O efeito das variáveis independentes sobre a VM dos futebolistas foi analisado por meio de uma ANOVA com nível de significância de  $p < 0,01$ . Os jogadores de futebol da Premier League (PL) apresentaram MV mais alto em comparação com os de outras ligas. Os jogadores de futebol estrangeiros apresentaram VM superior em comparação aos jogadores de futebol nacionais. Jogadores de futebol entre 21-30 anos apresentaram maior VM em comparação com aqueles com  $<21$  e  $>30$  anos. Os atacantes e meio-campistas mostraram maior VM em relação aos goleiros e laterais. Os jogadores de futebol que representaram seus países em jogos internacionais apresentaram maior MV em comparação com aqueles que não o fizeram. Jogadores de futebol em formação de jovens em clubes da PL e La Liga (LL) apresentaram maior VM em comparação com jogadores de futebol de outros clubes. Em conclusão, fatores intrínsecos e extrínsecos afetam a VM dos jogadores de futebol. Os resultados desta pesquisa podem ser úteis para dirigentes esportivos no processo de seleção de jogadores profissionais de futebol.

**Palavras chave:** Sport; Atletas; Desempenho; Jovens atletas; Impacto econômico.

### INTRODUCTION

Soccer is the best-known sport in the world (Polito et al., 2017). Its great popularity has caused it to be considered an activity with great economic potential (García del Barrio & Pujol, 2008; Castillo-Rodríguez, López-Aguilar & Alonso-Arbiol, 2021). Recent studies have indicated that the income generated by European soccer competitions reached 14,000 million euros (Espitia-Escuer, García-Bernal & García-Cebrián, 2018). This has allowed clubs to make profits that they can then invest in players (Szymanski & Leach, 2006). In this sense, compared to the American theory that is governed by an equitable distribution of benefits between the clubs (García del Barrio, & Pujol, 2008), in European soccer, the economic distribution seems to be concentrated in a few clubs (Feess & Stähler, 2005). Although this model has not hindered the enhancement of major European competitions, it would seem logical that having higher incomes allows clubs to access highly demanded players and therefore increase their sports performance (Gaviria, Valbuena & Gregory, 2019; Szymanski, 2001; Szymanski & Leach, 2006).

Teams that have players capable of achieving greater sports performance with their squads will obtain higher economic income (García-del Barrio & Pujol, 2008; Matesanz, Holzmayer, Torgler, Schmidt & Ortega, 2018). This financial projection is used by the

clubs to improve their human resources by investing in young talents in their academies and to be able to project them to the professional team (Serra-Olivares, García-López & Cuevas-Campos, 2015; Reverter-Masía, Adell Pla, Hernández-González, Jové-Deltell & Fonseca, 2016) or hiring directly already successful senior players to be included in the first teams (Matesanz et al., 2018). The latter strategy seems to be the predominant management model among most of the big European clubs (Reverter-Masía et al., 2016). For this reason, the effects of the transfer market and the variables that influence the market value (MV) of the players are becoming an aspect to take into account in soccer (Pérez-González, Fernández-Luna, Vega, & Burillo, 2018; Kalen, Rey, de Rellan-Guerra, & Lago-Peñas, 2019).

The MV is determined by multiple factors, among which those that determine sports talent stand out (Michailidis, 2014; Cabral de Andrade, González-Villora, Casanova & Teoldo, 2020). This performance ability depends on anthropometric, physiological and psychological aspects, technical, motor and cognitive skills, the environment where the sports training process was carried out, and the absence of injuries, besides family support and genetic predetermination (Williams & Reilly, 2010; Lago-Peñas, García & Gómez-López, 2016). To our knowledge, there are few studies that have analysed the influence of some

of these variables on the MV of soccer players. In a study that analysed 1,000 elite soccer players of senior and U-19 category, no relationship was observed between the semester of birth and the MV (Doyle & Bottomley, 2018). Age analysis indicated that 26-year-old Premier League players had the highest MV (Anderson & Sally, 2013). Another investigation that analysed the effect of age on players from Top-5 European Soccer Leagues observed that soccer players aged 16-20 years had a lower MV than those aged 21-30 but higher than that of those older than 31 years (Kalen et al., 2019; Oterhals, Lorås & Pedersen, 2021). Finally, the analysis of the relationship between MV and playing position indicated that the forwards had higher values than the defenders (Kalen et al., 2019). However, the aforementioned studies usually incorporated reduced sample sizes (i.e. <1,000) and incorporated only isolated associations (i.e., MK was associated with only one or two extrinsic factors), precluding a more comprehensive appraisal.

Therefore, to advance the field, the objective of this study was to analyse the MV of professional soccer players from Top-5 European Soccer Leagues, based on players extrinsic factors.

## METHODS

### *Sample*

The sample consisted of all soccer players (n = 2,598) participating in the Top-5 European Soccer Leagues (Rohde & Breuer, 2017) during the 2019-2020 season. The soccer players participated in the following competitions: Premier League from England (PL, n = 516), La Liga from Spain (LL, n = 497), Serie A from Italy (SL, n = 528), Bundesliga from Germany (BL, n = 521) and Ligue 1 from France (1L, n = 536).

### *Dependent variable*

The MV expressed in millions of euros (M €) was used as the dependent variable. To obtain the MV, Transfermarkt.com (<https://www.transfermarkt.es>) was used. This website register statistical data on soccer players. The reliability of the data has been demonstrated in previous studies (Herm, Callsen-Bracker, & Kreis, (2014); Gerhads, & Mut, 2017; Peeters, 2018). The MV is estimated considering factors such as chronological age, playing position, previous transfers, physical condition, sports injuries, salary, performance in his club, the participation with national teams, the interest of other clubs, professional

experience, hierarchy within the club and its potential as an advertising medium. Following indications from previous works (Pérez-González et al., 2018), the MV data was collected once the winter window of the transfer market for the 2019-2020 season (January 1, 2020) had been completed. The official web pages of the clubs participating in the study were used to complete complementary data (i.e., date of birth and laterality).

### *Independent variables*

**League.** The soccer players were divided into those who played at the i) PL, ii) LL, iii) SL, iv) BL, v) 1L.

**Nationality.** The soccer players were divided into i) national soccer players, when they played in the same league as their country of birth; ii) foreign soccer players, when they played in a league other than their country of birth (Rodríguez-Lorenzo, 2015).

**Chronological age.** The soccer players were divided into the following age categories i) <21 years; ii) 21-25 years; iii) 26-30 years; iv) 31-35 years; v) >35 years (Kalen et al., 2019).

**Laterality.** The soccer players were divided into: i) right-handed soccer players, when their skillful leg was the right one; ii) left-handed soccer players; iii) and ambidextrous when they use both legs with comparable level of skill (Castañer et al., 2016).

**Playing position.** The soccer players were divided into i) goalkeepers; ii) defenders; iii) midfielders; iv) and forwards (Reverter-Masía et al., 2016).

**International player condition.** The soccer players were divided into those who participated at least once in an international official or friendly match with their national team squad at i) absolute international soccer players, ii) non-international soccer players, iii) youth international soccer players, iv) and non-international soccer players in lower categories.

**Sports training conditions.** The soccer players were divided into i) soccer players from the youth system, if they participated  $\geq 3$  seasons in the youth categories of their current professional club, ii) soccer players that were not in the youth system, iii) soccer players from the reserve team, if they played in this team only

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and iv) soccer players that were not in the reserve team (Rodríguez-Lorenzo, 2015).

### Statistical analysis

To analyse the composition of the sample in relation to the variables under study, Chi-square tests were performed and corrected standardized residuals were included to obtain the excitatory ( $>2.0$ ) or inhibitory ( $<-2.0$ ) patterns among the analysed categories (Bakeman, & Quera, 1996). To analyse the effect of the independent variables on the MV of the soccer players, an ANOVA was performed. In all cases, the effect size (partial eta squared;  $\eta^2$ ) was included, assuming the range established by Tabachnick & Fidell (2007): between 0 and .009, negligible; between .010 and .089, low; between .090 and .249, medium; and from .250, large. In addition, the corresponding ex-post tests were performed to analyse the main effects (Scheffe's test) and the interactions (Bonferroni adjustment). The  $p < 0.01$  was considered significant. The analyses were performed with the IBM® SPSS® Statistics 25 program (IBM Co., New York, NY, United States).

## RESULTS

No significant differences were found in the percentage of cases in the different leagues [ $\chi^2(4, n = 2,598) = 1.67, p = 0.80$ ], nor between the number of soccer players with vs. without experience with their national team squad [ $\chi^2(1, N = 2,598) = 5.00, p = 0.025$ ].

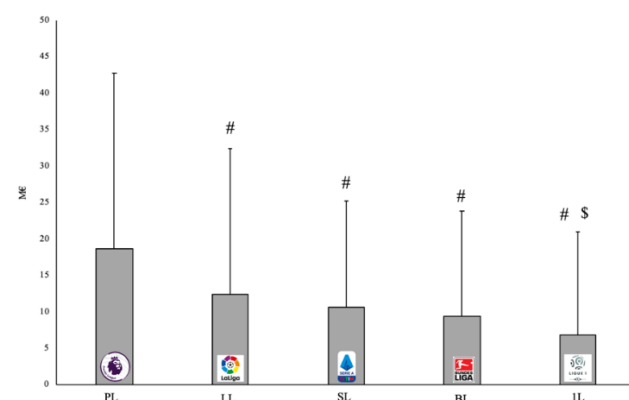
A greater percentage of foreign soccer players was observed [ $\chi^2(1, N = 2598) = 8.89, p = 0.0003$ ]. A lower percentage of soccer players  $>31$  and  $<21$  years of age was observed compared to other age groups [ $\chi^2(4, N = 2,598) = 1172.39, p < 0.001$ ]. A greater percentage of right-handed soccer players was observed compared to ambidextrous soccer players [ $\chi^2(2, N = 2,598) = 1911.48, p < 0.001$ ]. Fewer percentage of goalkeepers

were observed compared to the rest of field positions [ $\chi^2(3, N = 2,598) = 281.82, p < 0.001$ ].

The percentage of soccer players from the youth system was lower compared with soccer players that were not in the youth system [ $\chi^2(1, N = 2,598) = 1189.59, p < 0.001$ ], and also percentage of soccer players from the reserve team with respect to soccer players that were not in the reserve team [ $\chi^2(1, N = 2598) = 1383.69, p < 0.001$ ].

The descriptive data for MV according to independent variables are presented in Table 1. *Differences between Leagues*

The main effect of the leagues factor was significant [ $F(4.26) = 32.37, p < 0.001, \chi^2 = 0.05$ ]. The MV of soccer players from the PL was greater compared to the rest of the Leagues. Furthermore, soccer players from LL had greater MV compared to those from the 1L ( $p < 0.01$ ) (Figure 1).



**Figure 1.** Market value of the soccer players in the Top-5 European Soccer Leagues

PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France).

#: significantly different compared to PL ( $p < 0.01$ ); \$: significantly different compared to LL ( $p < 0.01$ ).

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**Table 1.** Market value (mean ± SD, expressed in millions of euros) according extrinsic factors.

	League					National soccer players (n=1,223)	Foreign soccer players (n=1,375)
	PL (n=516)	LL (n=497)	SL (n=528)	BL (n=521)	1L (n=536)		
Nationality Factors							
Nationality							
National soccer players (n=1,223)	8.63 ± 15.20	15.75 ± 22.37	8.63 ± 13.35	7.90 ± 11.61	6.97 ± 13.40	6.05 ± 13.94	
Foreign soccer players (n=1,375)	14.02 ± 20.28	20.15 ± 24.85	18.18 ± 26.39	12.34 ± 16.13	11.48 ± 14.93	7.59 ± 14.32	
Chronological Age							
< 21 (n=304)	8.41 ± 1.03	15.06 ± 14.95	14.66 ± 21.44	12.24 ± 18.92	6.68 ± 17.61	3.63 ± 6.06	6.39 ± 12.33
21-25 (n=957)	13.50 ± 581.56	23.60 ± 24.35	12.70 ± 18.66	12.12 ± 14.37	11.81 ± 15.35	8.51 ± 16.24	11.69 ± 19.57
26-30 (n=890)	13.37 ± 603.06	20.01 ± 27.44	14.17 ± 21.88	11.69 ± 15.62	10.23 ± 12.06	8.22 ± 16.79	9.24 ± 13.45
31-35 (n=395)	6.11 ± 905.23	7.27 ± 9.43	7.87 ± 17.92	6.33 ± 9.99	4.31 ± 10.06	3.51 ± 6.11	3.73 ± 6.40
> 35 (n=52)	0.77 ± 2.49	0.95 ± 0.52	1.22 ± 801.25	0.84 ± 12.50	0.57 ± 0.41	0.77 ± 0.81	0.71 ± 70.12
Laterality							
Right-handed soccer players (n=1,872)	11.15 ± 17.72	18.60 ± 24.06	10.40 ± 15.91	9.99 ± 13.84	9.59 ± 14.59	7.12 ± 15.84	8.67 ± 15.96
Left-handed soccer players (n=625)	11.86 ± 18.19	17.40 ± 22.66	14.89 ± 23.44	11.04 ± 15.59	10.23 ± 14.76	5.92 ± 8.13	8.98 ± 13.33
Ambidextrous soccer players (n=101)	15.46 ± 26.56	30.11 ± 34.76	35.37 ± 44.36	14.51 ± 18.25	2.18 ± 4.62	5.26 ± 6.90	4.56 ± 8.08
Extrinsic Factors							
						National soccer players (n=1,223)	Foreign soccer players (n=1,375)
Playing position							
Goalkeepers (n=303)	5.97 ± 13.24	8.78 ± 17.65	10.13 ± 20.84	5.73 ± 10.79	2.95 ± 4.55	3.17 ± 4.94	3.76 ± 7.88
Defenders (n=880)	9.72 ± 13.65	15.20 ± 17.70	9.87 ± 14.02	8.51 ± 12.47	9.63 ± 12.57	5.56 ± 8.07	7.95 ± 11.86
Midfielders (n=747)	12.87 ± 18.04	21.51 ± 3.57	14.59 ± 20.44	11.78 ± 14.94	10.15 ± 15.38	6.81 ± 10.00	10.28 ± 15.13
Forwards (n=608)	14.76 ± 24.06	24.93 ± 31.64	13.86 ± 25.12	14.50 ± 17.59	11.21 ± 17.20	9.98 ± 23.59	10.46 ± 21.09
International player condition							
Absolute international soccer players (n=1,356)	17.44 ± 22.68	23.10 ± 27.03	22.62 ± 26.62	14.67 ± 16.51	15.23 ± 18.01	9.97 ± 20.09	20.74 ± 24.20
Non-international soccer players (n=1,242)	4.98 ± 7.43	8.52 ± 9.78	4.91 ± 6.90	4.20 ± 7.60	4.18 ± 6.77	4.48 ± 6.42	4.39 ± 6.20
Youth international soccer players (n=1,925)	13.52 ± 19.90	20.10 ± 24.87	16.55 ± 23.07	11.44 ± 14.77	10.56 ± 15.36	8.47 ± 17.12	10.87 ± 17.39
Non-international soccer players in lower categories (n=673)	5.66 ± 10.48	11.27 ± 18.10	4.23 ± 6.96	7.67 ± 13.82	4.23 ± 7.03	3.80 ± 4.78	3.42 ± 5.20
Sports training conditions							
Soccer players from the youth system (n=420)	11.13 ± 19.47	22.37 ± 27.81	15.45 ± 22.80	9.51 ± 16.69	5.38 ± 12.47	5.48 ± 8.91	10.58 ± 17.96
Soccer players that were not in the youth system (n=2,178)	11.55 ± 18.02	18.08 ± 23.49	11.55 ± 19.19	10.70 ± 14.30	10.37 ± 14.68	7.01 ± 14.88	7.84 ± 13.88
Soccer players from the reserve team (n=351)	10.86 ± 19.61	21.02 ± 27.22	12.77 ± 21.46	-	5.25 ± 10.54	4.40 ± 7.95	10.14 ± 17.71
Soccer players that were not in the reserve team (n=2,247)	11.58 ± 18.05	18.24 ± 23.57	12.21 ± 19.54	10.54 ± 14.62	9.83 ± 14.69	7.34 ± 15.20	8.17 ± 14.34

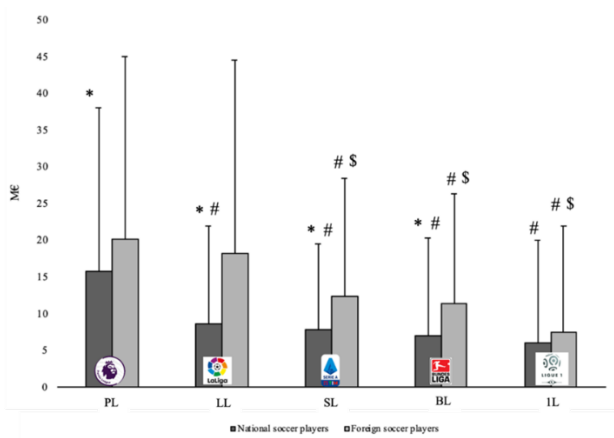
PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France).



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### Nationality

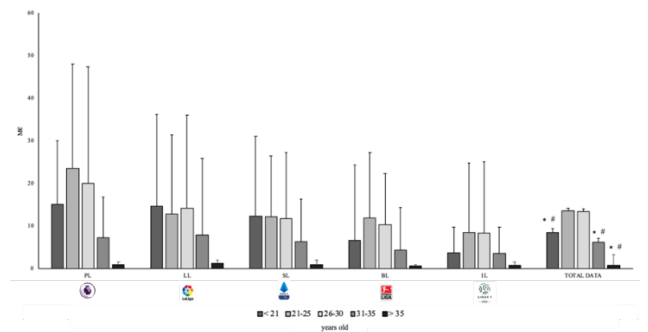
Significant differences were observed in the MV according to nationality [F (1.26) = 47.87,  $p < 0.001$ ,  $\chi^2 = 0.02$ ], with a significant nationality $\times$ league interaction [F (4.26) = 3.31,  $p = 0.01$ ,  $\chi^2 = 0.01$ ]. With the exception of 1L, the MV of the foreign soccer players was greater ( $p < 0.01$ ) compared to national soccer players in all leagues. In addition, the MV of the national soccer players from the PL was greater ( $p < 0.01$ ) compared to national soccer players from the rest of the leagues. Moreover, the MV of the foreign soccer players from LL and PL was greater ( $p < 0.01$ ) compared to foreign soccer players from SL, BL and 1L (Figure 2).



**Figure 2.** Market value in the Top-5 European Soccer Leagues for national soccer players (black column) and foreign soccer players (grey column). PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France). \*: significantly different compared to foreign soccer players ( $p < 0.01$ ); #: significantly different compared to PL ( $p < 0.01$ ); \$: significantly different compared to LL ( $p < 0.01$ ).

### Chronological age

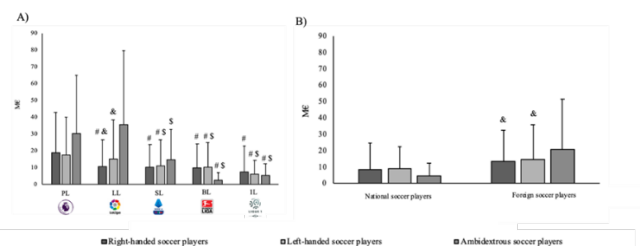
The main effect of the age factor was significant [F (4.25) = 17.30,  $p < 0.001$ ,  $\chi^2 = 0.03$ ]. The MV was greater ( $p < 0.01$ ) in soccer players between 21-25 and 26-30 years of age compared to soccer players from the remaining age-groups. (Figure 3). Because the interaction is not significant, this pattern of results is obtained for all Leagues.



**Figure 3.** Market value according to chronological age of the soccer players. PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France); \*: significantly different compared to 21-25 years old ( $p < 0.01$ ); #: significantly different compared to 26-30 years old ( $p < 0.01$ ).

### Laterality

A significant laterality $\times$ league interaction was noted [F (8.26) = 2.84,  $p = 0.004$ ,  $\chi^2 = 0.01$ ]. Ambidextrous soccer players from LL had greater MV ( $p < 0.01$ ) compared to right-handed and left-handed soccer players from the same league. Left-handed soccer players had a significantly higher MV ( $p < 0.01$ ) in LL and PL than in SL, BL and 1L. Finally, the ambidextrous ones had a significantly higher MV ( $p < 0.01$ ) in LL with respect to SL, BL and 1L, and in PL with respect to BL and 1L (Figure 4). No significant differences were found between leagues in the case of right-handed soccer players.

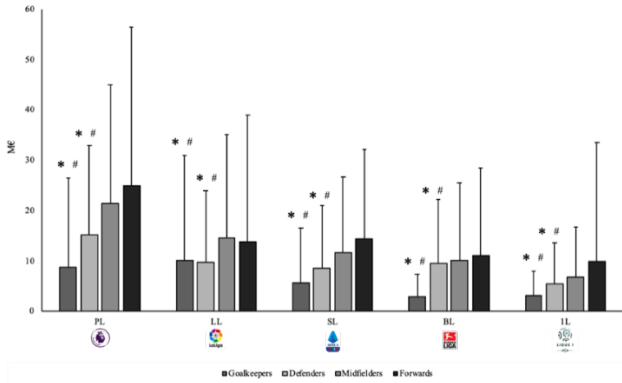


**Figure 4.** Market value according to the laterality taking into account league (A) or nationality (B). PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France). #: significantly different compared to PL ( $p < 0.01$ ); \$: significantly different compared to LL ( $p < 0.01$ ); &: significantly different compared to ambidextrous soccer players ( $p < 0.01$ ).

### Playing position

The main effect of the playing position factor was significant [F (3.26) = 17.44,  $p < 0.001$ ,  $\chi^2 = 0.02$ ]. The MV of midfielders and forwards was greater ( $p < 0.01$ ) compared to goalkeepers and defenders. Because the

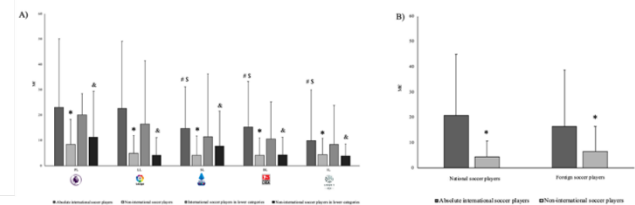
interaction is not significant, this pattern of results is obtained for all Leagues.



**Figure 5.** Market value according to the playing position of the soccer players in the Top-5 European Soccer Leagues. PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France); \*: significantly different compared to Midfielders ( $p < 0.01$ ); #: significantly different compared to Forwards ( $p < 0.01$ ).

*International player condition*

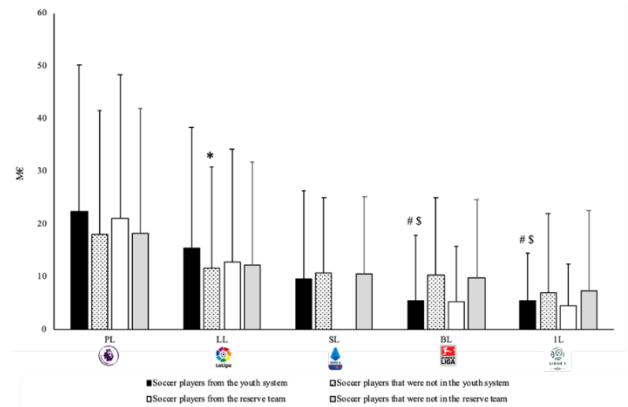
The internationality variable reflected a significant effect [ $F(1,26) = 266.10, p < 0.001, \chi^2 = 0.10$ ]. Soccer players with participation in the absolute national team squad had greater MV compared to non-international soccer players ( $p < 0.01$ ) (Figure 6). Regarding the absolute international soccer players  $\times$  league interaction, significant effects were found [ $F(4,26) = 3.95, p = 0.003, \chi^2 = 0.01$ ]. The MV of the absolute international soccer players was significantly higher ( $p < 0.01$ ) in the PL and LL, than in the SL, BL and 1L. Similarly, youth international soccer players had greater ( $p < 0.01$ ) MV compared to non-international soccer players in lower categories [ $F(1,2578) = 69.87, p < 0.001, \chi^2 = 0.03$ ].



**Figure 6.** Market value according to international player condition (A) and nationality (B). PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France); #: significantly different compared to PL ( $p < 0.01$ ); \$: significantly different compared to LL ( $p < 0.01$ ); \*: significantly different compared to Absolute international soccer players ( $p < 0.01$ ). &: significantly different compared to Non-international soccer players in lower categories.

*Sports training conditions*

The soccer players from the youth system  $\times$  league interaction indicated significant effects [ $F(4,26) = 4.12, p = 0.003, \chi^2 = 0.01$ ]. The MV of soccer players from the youth system was significantly higher ( $p < 0.01$ ) than soccer players that were not in the youth system in LL and the MV of the non-soccer players from the youth system higher than the MV of the soccer players from the youth system in BL. On the other hand, the MV of the youth soccer players from the youth system was significantly higher ( $p < 0.01$ ) in LL and PL than in BL and 1L (Figure 7). In the analysis of soccer players from the reserve team, no significant effects were found.



**Figure 7.** Market value according to sports training conditions. PL: Premier League (England); LL: La Liga (Spain); SL: Serie A (Italy); BL: Bundesliga (Germany); 1L: Ligue 1 (France); \*: significantly different between soccer players for the youth system and soccer players that were not in the youth system ( $p < 0.01$ ); #: significantly different compared to PL ( $p < 0.01$ ); \$: significantly different compared to LL ( $p < 0.01$ ).

**DISCUSSION**

The objective of this study was to analyse the MV of professional soccer players from Top-5 European Soccer Leagues, based on players extrinsic factors. Main findings indicate greater MV for players from the PL compared to LL, SL, BL and 1L. Foreign soccer players showed greater MV compared to national soccer players, particularly in the PL. Players between 21-30 years of age, and those playing as midfielders and forwards had greater MV compared to other age groups and field position, respectively. Moreover, players with experience with their national

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(adult) team had greater MV compared to other players.

Regarding the greater MV for players from the PL, previous studies agree with this finding, indicating greater total MV in the PL (i.e. 3.75 thousand million euros) compared to LL (i.e. 2.92 thousand million euros), SL (i.e. 2.40 thousand million euros), BL (i.e. 2.38 thousand million euros) and 1L (i.e. 1.45 thousand million euros) (Rodríguez-Lorenzo, 2015). The greater MV of players in the PL is related to the greater transfer investment of the PL clubs (Matesanz et al., 2018). Such investment had a background on important clubs income from success in important tournaments such as Champions League (e.g., Tottenham club, Liverpool club) and UEFA Europa League (e.g., Arsenal club, Chelsea club). However, other authors have suggested that economic aspects are not causative of soccer sport club success (Szymanski, 2001; Szymanski & Leach, 2006). Future studies may clarify the relationship (if any) between team sport success and its financial projection, and how this may affect the MV of the players.

The greater MV of foreign soccer players compared to national soccer players was observed across all leagues, except 1L. Moreover, the MV of foreign soccer players in the PL and LL was greater compared to the MV of foreign soccer players from other leagues. A previous study indicated that in the 2009-2010 season and 2013-2014 season, a greater number of foreign soccer players was observed in the PL and LL compared to other leagues (Rodríguez-Lorenzo, 2015). It is possible that team sport success is related to the number of foreign soccer players, particularly those with greater MV. Of note, in the PL, national players had greater MV compared to national players from other leagues. This may explain the reduced number (i.e. n=10) of English soccer players among LL, SL, BL and 1L (<https://www.transfermarkt.es>).

A higher MV was observed for players between 21-25 years and 26-30 years, similar to previous studies (Anderson and Sally 2013; Dendir, 2016; Kalen et al., 2019). However, another study found a higher MV for players around 20 years of age (Caley, 2013). Such experience gain may be associated with increased MV, particularly in the 21-30 years of age span. However, modern soccer has evolved, with more scientific training approaches, better training system formation, technological improvements, among other advances.

These factors can accelerate the age of maximum performance (Allen & Hopkins, 2015), thus reducing the peak age of MV. On the other hand, our results indicate that at 30 years of age the MV of soccer players is reduced, a result similar to that of a previous study (Kalen et al., 2019). Despite the existence of studies such as that of Allen & Hopkins (2015) that indicated that athletes increasingly lengthen their maximum performance due to improvements in the training process and advances in science and technology applied to the sport, the MV for players >30 years of age decline. On the other hand, it is necessary to have a certain sport-related maturity (>21 years of age) to achieve a high MV within the 5 main leagues of European soccer, with most players usually having a background of >10 years of competitive experience, most of them participating in amateur-professional clubs from a youth age. Therefore, it seems advisable to indicate to young players to be patient in economic aspects and to those who have passed the age of 30 to have a great discipline in terms of personal and sports care, in order to maintain an adequate competitive level and MV.

As a novel finding, ambidextrous soccer players had greater MV compared to right-handed or left-handed soccer players. Ambidextrous soccer players are usually considered among the best in the world (Castañer et al., 2016), with greater resolution chances during a given match-related technical or tactical situation when compared to right-handed or left-handed soccer players (Teixeira, Oliveira, Romano, & Correa, 2011). Another important finding in this study was the greater MV of midfielders and forwards compared to other field positions. This finding confirms those from a previous study (Kalen et al., 2019). The main aim of a team to win a match is to score goals (Faude, Koch & Meyer, 2012). In this sense, the MV of soccer players would be higher for those who contribute most to this aim (Majewski, 2016; Yuang, 2015; Poza, 2020). Moreover, another novel finding in this study was the greater MV of soccer players with competitive experience in their national adult team compared to those without experience. National teams usually call their best soccer players to play during classification tournaments (e.g. World cup) and relevant international matches.



In LL the MV of soccer players from the youth formation system of their current club was greater compared to other players. A solid youth formation system allow an efficient investment strategy for soccer players clubs (Reverter-Masía et al., 2016), given them the chance to increase the MV of the players. Moreover, is possible that the system allow players a solid education, integration in a safe and healthy environment and feel an important part of it, identified with the values and philosophy of the club independent from economic factors. Soccer players from club's youth formation system, therefore, receive a solid social-educational background, independent from their future in soccer players. In return the club investment may increase the MV of soccer players. Moreover, soccer players from the youth formation system had emotional links with fans, and the structure of the club (Rodríguez-Lorenzo, 2015), with soccer players considering their club frequently as a second-home.

As a potential limitation, the data obtained from Transfermarkt may not reflect with precision the laterality or playing position factors. Therefore, results for these moderators should be interpreted with caution.

Future studies may incorporate into the analysis leagues from other continents (e.g. Latin America). In addition, considering the new political and management context in the United Kingdom (i.e., Brexit), it may become necessary for future studies to analyse its effect on the MV of soccer players. Moreover, future studies may include additional factor in the analysis of MV, such as total number of goals scores, red/yellow cards received, total minutes played, previous injuries, among others.

## PRACTICAL APPLICATIONS

It is recommended that those responsible for preparing soccer team templates, i) take into account that foreign soccer players, as a general rule, have a higher MV than national soccer players, ii) that players aged between 21 and 30 years old, who play as midfielders and forwards, reach a higher MV compared to other age groups and position on the field, respectively and iii) that it is advisable to have players with experience in absolute national teams in the squads, since these they reach a higher MV than other absolute non-international players. Extrinsic factors affect the MV

of professional soccer players. Current results may aid sport managers in the selection of professional soccer players.

## DECLARATION STATEMENT

No potential conflict of interest to report.

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