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### RESEARCH ARTICLE

## UNDERSTANDING LA LIGA: ARE MATCH PERFORMANCES AND PLAYER MARKET VALUE RELATED?

Shounak Sengupta

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#### Abstract

Football- one of the most popular sports worldwide, has emerged as a huge centre of business. Through this research study, I aim to understand the relationship between match performances of footballers and their respective values in the European Transfer Market. This paper explores this particular trend in the latest season of *La Liga* 2019/20 (Spanish Division one football). This study also focuses on understanding whether players of foreign nationalities have been understood to have a higher value compared to the home-grown players of the league.

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#### Introduction:-

##### Literature Review:

Football as a sport has not been commercialised since a long time. In 1995, the historical Bosman Ruling was at the forefront of the change. (Kessenne, 2007). It clarified the non-linear consideration between national footballers and other goods of national importance. This ultimately led to a gradual change in the employment contracts of footballers, initially in the English Leagues (Szymanski, 2000). More efficient contracts were provided to the players, that gave them a sense of financial security. This entire situation led to the players being visualised as an asset to any club organization. The above ruling by the European Court of Justice also delivered them a freedom of contract, allowing them to choose any club to play for, ones who offer them a contract. (Peter Antonioni, 2000). The player's performances were seen as accounting asset, which required an independent system of valuation (Morrow, 1996).

This led to a demand of a market system in Europe, which can govern and identify the values of players. Values that can be utilized as a base price for the clubs to negotiate the purchase or the sale of the player. (Qing Yi, 2020) studied the technical match performance of top-class football players. It depends upon the playing positions, and five situational variables, alongside data from The Champions' League. (Ante, 2020) used a dataset of football transfers in 'The Big 5', which included unconventional factors such as player demographics, characteristics and performance, to identify transfer fees. Meanwhile, (Majewski, Identification of Factors Determining Market Value of the Most Valuable Football Players, 2016) created an econometric model to assist managers into making well informed decisions, with respect to the valuation of forward playing positions. Another approach was to take the correlation of player popularity with their wages and market value (Rachel Scarfe, 2020).

This approach was not just limited to the club football leagues. A 'deterritorialisation' of footballers was noticed, with increasing number of foreign players in the Big 5 Leagues (Raffaele Poli, 2018). (Zsolt, 2016) understood the role Euros (2012) played in shaping the market value of a player- on the basis of his national team, club, longevity of his contract, age and his position. (Martin Littlewood, 2011) examined whether the migration inside Europe

constitutes a significant variable which enhances a player's annual valuation. Whereas, (Dimitropoulos, 2016) studied the player acquisition trends of the 'Big 5' leagues- the impact of indigenous home-grown players, non-indigenous home-grown players and foreign players within the respective leagues.

Due to this certain commercialisation of the sport, there was an increased involvement of foreign strategic investors in countries like Germany, France, and England (Marc Rohde, 2017). Therefore, player recruitment had become a serious business. Constrained models were used to give a real-time analysis, adjusted to various budgets (Giovanni Pantuso, 2019). ANOVA, Regression analysis were utilized in other models to find the player's maximum economic value (Jose Luis Felipe, 2020). Other tools like data analysis (Oliver Muller, 2017), Machine Learning (Narek Sahakyan, 2020), (David Matesanz, 2018), Empirical Models (Stephen Dobson, 2010), and data-optimization methods (Vineet M. Payyapalli, 2019) came into the picture as well.

**Research**

- 1. Explicit Difference between Transfer Value and Market Value
- 2. Insufficient country-specific studies in Spain and Italy.

**Gaps:**

**Research Design:**

**Aim-** Evaluate and understand the relationship between match performances and the market value of footballers playing in *La Liga* (Spanish Division 1 Football) 2019-20. Therefore a quantitative research including data from secondary sources is initiated to find the above. The result of this study would require an in depth understanding of the subject, and hence causal and descriptive research has been utilized. These mechanisms allow us to understand the cause-and-effect relationship between the variables present, thus leading us to the result.

Data Collection Type	Quantitative
Source	Secondary
Data on the basis of Purpose	Descriptive
Sub-type	Causal
Study sample	Cross-Sectional

**Type of Research Design**

Since the data has been in a quantitative format, I have chosen to go ahead with a Causal- Comparative Research Design to study the desired. It is a type of a descriptive non-experimental research which is used to explain the reasons of existing differences between two or more data groups( nationality, match performance), which then is compared with an dependent variable (Market Value).

To meet the requirements of statistical assumptions, methods such as p-test, ANOVA, and correlation is undertaken.

**Data:**

**Sources:**

The data has been collected and curated from these following public databases: Transfer Markt, WhoScored, and Garter.

The market data is collected from Transfer Markt. The site uses its own non-disclosed algorithm to estimate the market value of a particular player. The values used in the study are confirmed to be true post the end of the 19/20 season.

The performance statistics have been gathered from WhoScored. Additionally, WhoScored provides a performance rating for all the players, using OPTA's statistics which is updated during each game. The rating variable is scaled from 0-10.

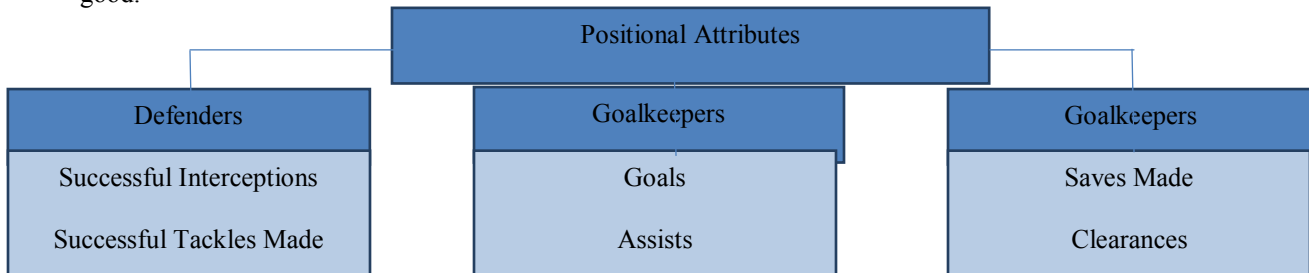
Finally, the personal characteristics of each player (i.e. Nationality, Age, Position, etc.) has been accessed from Garter in a similar fashion.

**Variables:**

For the benefit of the study, the entire set of 250 players has been divided into three segments on the basis of their position- Goalkeepers (50), Attackers (105) and Defenders (105). Keeping that in mind, there are several types of variables utilized. These are:

**Independent Variables:**

1. Player Name, Age- Utilized to mark each response for easy identification.
2. Essential Attributes (Minutes Played, Successful Passes/ 90 Minutes) – These attributes are essential for every footballer irrespective of their position. Hence, they have been marked for every footballer present in the dataset.
3. Positional Attributes- There are specific skill sets required for each position. For example, a keeper is judged on his ability to conduct saves, whereas an attacker has been viewed to keep his goal scoring high to be deemed good.

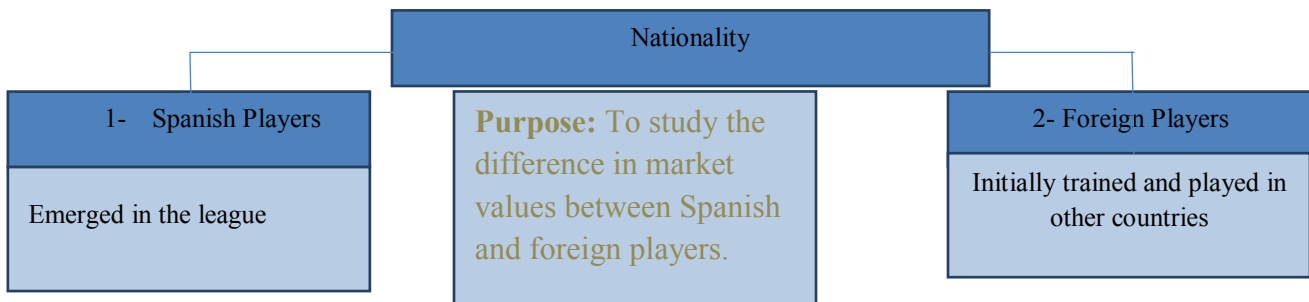


Flow Chart classifying the positional attributes utilised.

**Interconnected Variables:**

Clubs- Clubs play a smaller role in deciding the market value of a player. It acts as a small influencer. Players playing in bigger clubs tend to have more market value compared to the rest. To study this, all 20 clubs divided into four tiers with respect to their final league positions.

- 1- Real Madrid, FC Barcelona, Atletico Madrid, Sevilla FC, Villarreal CF
  - 2- Real Sociedad, Getafe, Granada, Valencia, Osasuna
  - 3- Athletic Bilbao, Levante, Real Valladolid, Eibar, Real Betis
  - 4- Alaves, Celta Vigo, Leganes, Mallorca, Espanyol
- Nationality- Approximately, players of more than 25 nationalities took part in the league. To clarify the study, nationality has been segregated into two sections:



**Dependent Variables:**

Flow Chart classifying Nationalities.

**Dependent Variables:**

1. Player Ratings- After every match, all players are rated using an ordinal scale having a score between 0-10. Naturally, 0 being the lowest and 10 being the highest. The average player ratings over the year are a culmination of all match performances shown by the footballers.
2. Market Value- A set value which determines the worth of any player in the European Transfer Market. This value provides a basis for other clubs to negotiate the purchase/ sale of any player.

**Number of Observations:-**

The entire data distribution consists of 250 *La Liga* footballers, divided into three separate sections with respect to their playing position.

The data in that respect consists of 40 goalkeepers, 105 attackers and defenders each.

**Cross Sectional Study:**

The entire research is based upon a cross-sectional study of 250 main players representing their teams over the period of one season. The playing statistics according to their position is noted down, and then correlation is conducted in order to understand the role match performance plays in boosting or downgrading one’s value in the European Transfer Market.

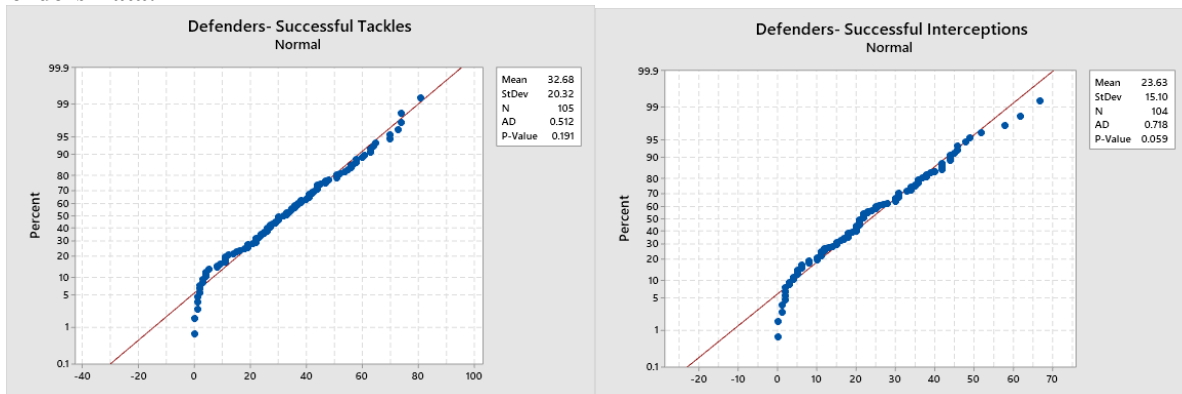
**Time Period :**

The study considers the latest complete season of *La Liga* (Spanish Football League), i.e. 2019/20 season. This season covers just above a whole year, from 11<sup>th</sup> June to 19<sup>th</sup> July; with a total of 380 matches being played.

**Normality Checking:**

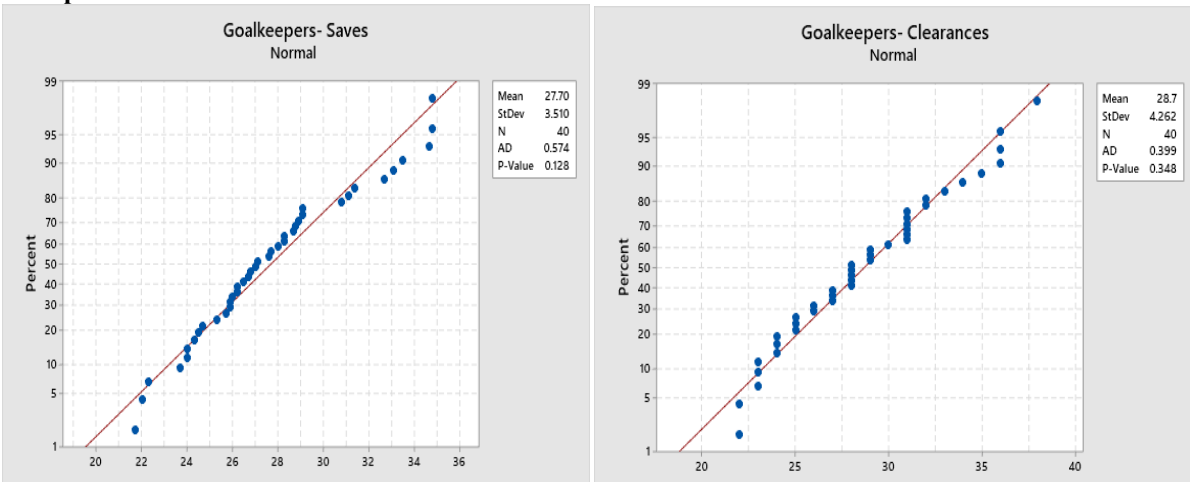
For a big set of data in this field of research, the null hypothesis is assumed as the set in not normal. Therefore, through Minitab I have been able to use the Anderson-Darling Test to prove that the sets taken are in a normal distribution. For the same, P-value needs to be more than 0.05.

**Defenders Data:**

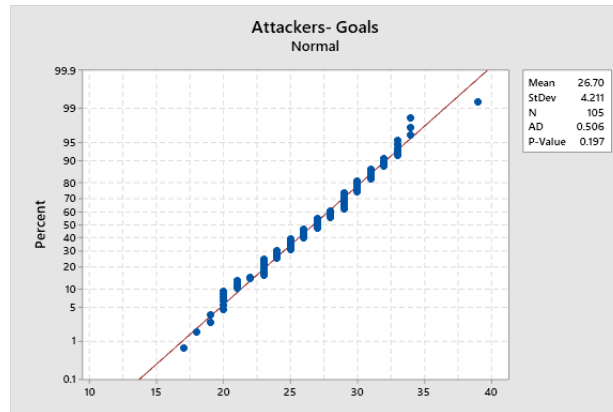


Defenders’ set of data for tackles and interceptions.

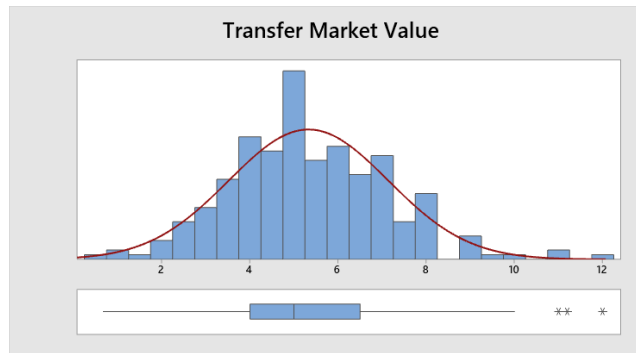
**Goalkeeper Data:**



Goalkeepers’ set of data for saves and clearances.

**Attacker Data:**

Attackers' set of data for goals scored.

**Transfer Market Value:**

Entire Normal distribution of the transfer market values of players, with box plot below.

In conclusion, the Null Hypothesis disproved and we can go ahead with the data analysis.

**Tools used for data analysis with justification:**

Minitab has been utilized as a data analysis tool. I have personally found it to be user-friendly, and effective in nature. It also provides all the necessary operations to conduct graphs, statistical tests and complicated functions like Regression, ANOVA, control charts, etc.

For simple mathematical functions and collecting the data, Microsoft Excel has also been utilized. The sole reason being, the familiarity behind it.

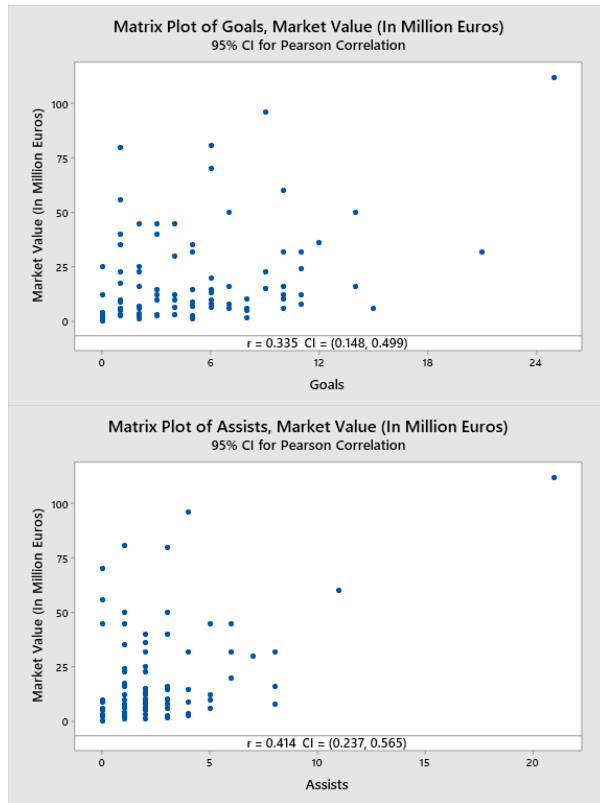
**Research Hypothesis :**

Therefore, since null hypothesis has been disproved; we can go ahead with formulating a research hypothesis. A good match performance by the *La Liga* footballers positively influences their market value. The second hypothesis is that footballers from foreign countries tend to have a higher market value compared to the same of the Spanish players.

*H1: Match Performance directly affects the players' market value*

*H2: Match Performances of Spanish footballers influence their market value more, when compared to the same for foreign players.*

**Testing H1:  
Attackers:**

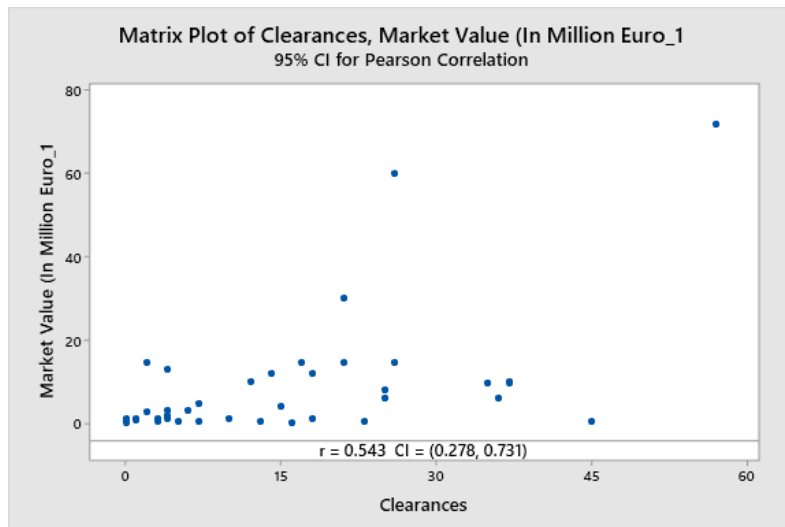


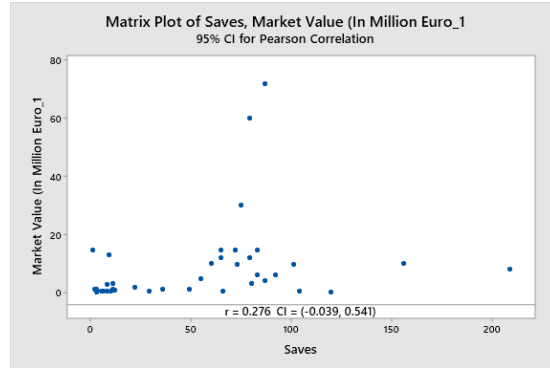
Correlational Matrix Plot for Attackers- Goals, Assists v/s Market Value.

**Analysis:**

As the results indicate, there is a correlation coefficient ( $r$ ) of 0.335 and 0.414 between the market value and goals; market value and assists respectively. This is a positive correlation, indicating that the number of assists and goals do help in positively influencing one's market value.

**Goalkeepers**

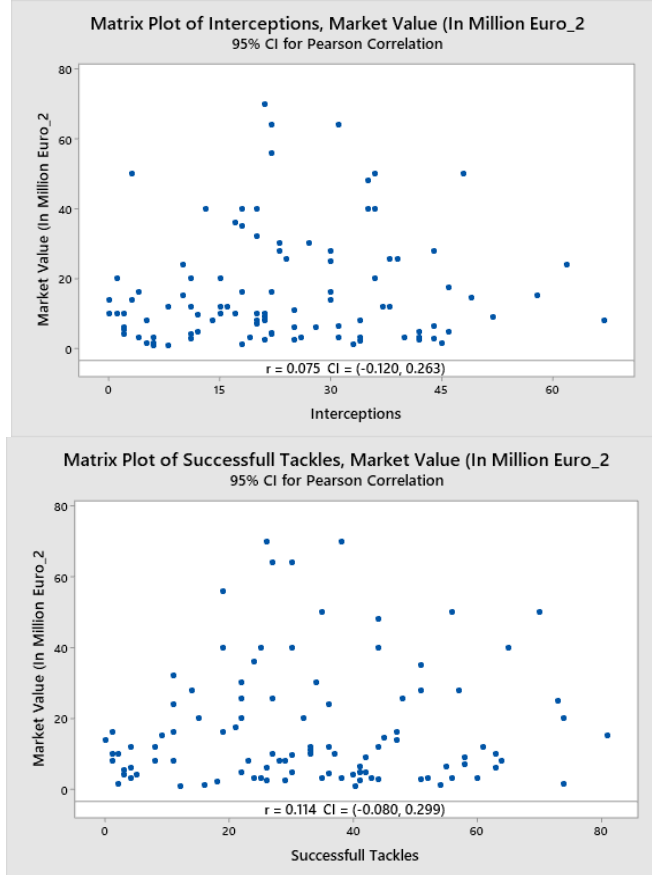




Correlational Matrix Plot for Goalkeepers- Clearances, Saves v/s Market Value.

**Analysis:**

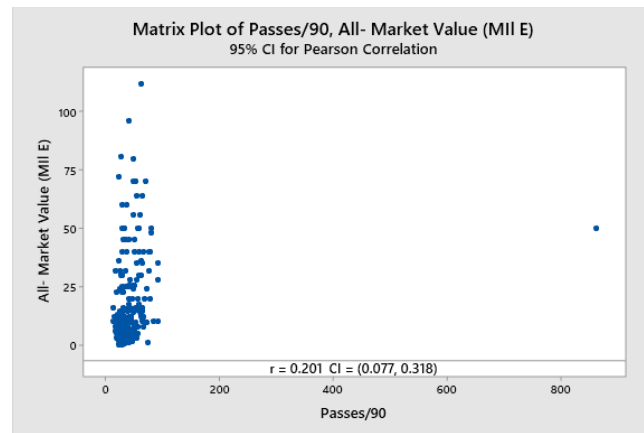
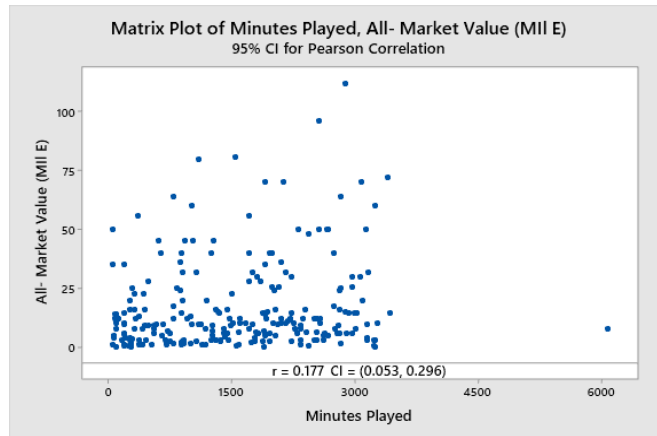
There seems to be a positive correlation in both clearances and saves along with the market value of the players in Spain. Although, interestingly the value of the positive correlation with clearances is the highest. It indicates that the ability to clear impending attacks contribute the most to the market value of any goalkeeper.



Correlational Matrix Plot for Defenders- Interceptions, Tackles v/s Market Value.

**Analysis:**

Here, the value of positive correlation is lesser compared to the other positions. This concludes that the market values of players vary with respect to their position. While a good defensive display contributes to your value, attacking and goalkeeping attributes seem to have more of an influence over their price tags.

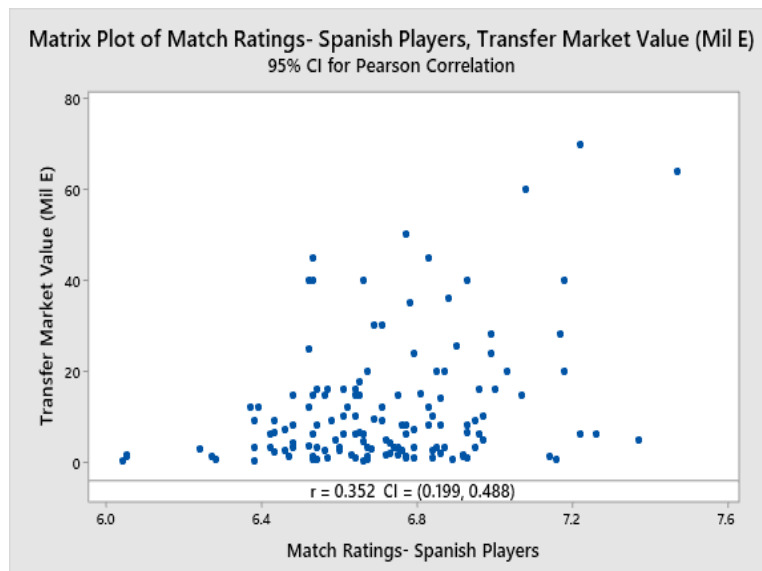


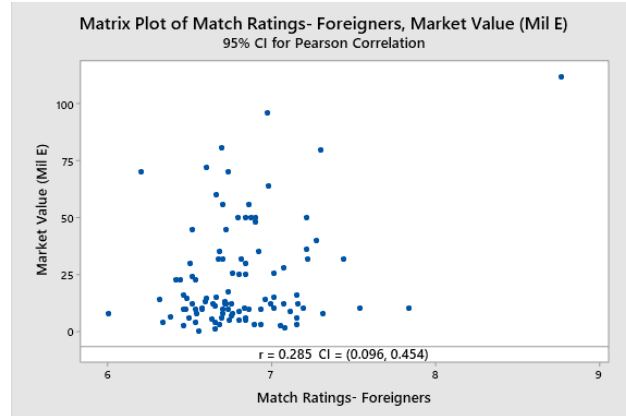
Correlational Matrix Plot for all *La Liga* players- Minutes Played, Passes/90 v/s Market Value.

**Analysis:**

Again, I have used the entire player database to understand how common footballing attributes play a role in deciding the market value. While Minutes played seems to have less to do with the same, higher the number of successful passes per 90 minutes your value gets influenced as well.

**Testing H2:**





Correlational Matrix Plot for Spanish and Foreign players- Match Ratings v/s Market Value.

**Analysis:**

Here, I have compared the average match ratings of the Spanish and foreign players with respect to their market values. Surprisingly, the correlation coefficient is higher for Spanish players, compared to the same for foreigners. That means that if the home grown players of *La Liga* perform as much as the foreigners, the value of home grown players would be slightly higher.

**Limitations:**

In the entire research study, I believe that these are certain limitations which have been taken in order to simplify the study outcome. These are:

1. No separate section of midfielders has been utilized.
2. Due to time constraints, the duration of study has been restricted to one year.
3. The unforeseen pandemic has also influenced the market values, causing a major disruption in the entire trend.

**Suggestions:-**

1. Similar studies can be done for the other Big 5 leagues to better understand the trend.
2. More seasons of *La Liga* should be taken under consideration.
3. Midfielders can also be separately studied.

**Conclusion:-**

Parameters	Correlational Coefficient (r)
Position- ATT	0.335 (Goals), 0.414 (Assists)
Position- GK	0.543 (Clearances), 0.276 (Saves)
Position- DEF	0.074 (Interceptions), 0.114 (Tackles)
Common attributes	0.177 (Minutes Played), 0.207 (Passes/90)
Spanish Players	0.352
Foreigners	0.285

**Conclusion Table:-**

Therefore, both of the Research hypotheses have been proved true, via statistical correlation between certain attributes of the game. The Correlational Coefficient (r), establishes the presence of a relationship between our two main variables. Performances on the pitch do influence your value. With more support provided to the Spanish players in terms of their market value, it only motivates and encourages them to put on a better show on the field.

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