

Scientific assessment of football players' transfer value

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Introduction

Transfer indemnities have steadily grown during the last decades in parallel with the economic development of professional football. This research note presents the scientific approach developed by the CIES Football Observatory to assess from a predictive perspective the transfer value of professional players.

When we first investigated this vast field in 2010, we did not think it would be possible to obtain such convincing results. The high explicative power of the econometric approach developed indicates that the degree of rationality of the football transfer market is important. Most of transactions follow a predictable logic, which is possible to model.

Within a very dynamic context, the greatest challenge from a predictive standpoint resides in the ability to anticipate the level of inflation of costs. This difficulty is all the more tricky as inflation does not intervene in a linear manner in time or according to market segments. However, as price determinants are stable, this does not recall into question the relevance of the approach developed.

Predicting interest

By speaking with market actors, it has become clear that the economic situation of both the releasing and recruiting clubs has a major influence in determining the transfer price. From a predictive standpoint, even before assessing the transfer value, it is thus necessary to ascertain the type of team that is most likely to have an interest for a given player. This step is not necessary if the actual or potential recruiting team is known.

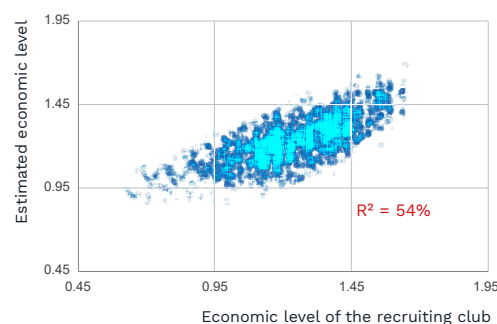
The first step of our approach consists of a multiple linear regression whose dependent variable is the economic level of the recruiting club. The sample used comprises more than 2,491 fee paying transfers having involved big-5 league players that took place between July 2011 and August 2018. Twice as many paid transfers are included in the model developed to assess transfer values at worldwide level. These samples are renewed every six months by taking into account transactions carried out during the last transfer window.

After the elimination of some outliers, the statistical model for estimating the most likely economic level of the recruiting club comprises 2,241 transactions. It includes 21 variables referring to the following elements:

- Activity in clubs and national teams
- Club and national team results
- Age
- Position
- League of employment
- Economic level of the releasing club

To optimise the solidity of the model and its predictive capabilities, only significant variables were retained. The model obtained is very significant as shown by the Fischer F test ($p < 0.0000$). The economic level of the projected recruiting club is correlated by 54% with the level actually observed for transfers included in the sample.

Figure 1: correlation between the predicted and actual economic level of the recruiting club



	SS	df	MS	N	2241
Model	49	21	2.37	F(21, 2241)	124.4
Residual	42	2219	0.02	Prob > F	0.000
Total	92	2240	0.04	R²	54.1
				R² adjusted	53.6
				Root MSE	0.138

Predicting values

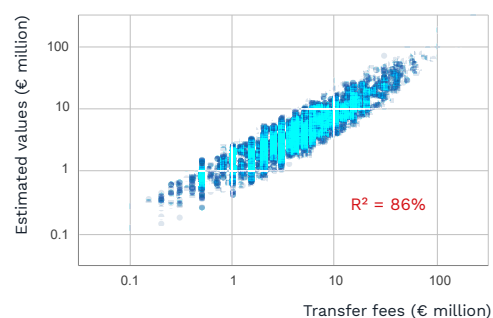
The second step of our approach consists of estimating the transfer value of professional footballers as such. The multiple linear regression developed for this purpose comprises 36 variables referring to the same areas to those used to estimate the economic level of the recruiting club. Moreover, the following further domains were considered:

- Contract duration
- Year of transfer
- Book value
- Loan status
- Nationality
- Economic level of the recruiting club (estimated if unknown)

After the removal of some outliers, the sample includes 2,249 transactions. All the variables retained have an error probability of less than 1%. This is reflected in a very high statistical significance and a high level of predictive capability. At big-5 league level, since the first applications of more rudimentary models in 2013, the correlation between values estimated and fees paid has constantly been above 75%.

The model built is again very significant as indicated by the Fischer F test ($p < 0.0000$). The estimated values correlate strongly with the actual transfer fees. The adjusted coefficient of determination reaches 86%.

Figure 2: correlation between estimated and actual transfer values



	SS	df	MS	N	
Model	557	36	15.49	2249	F(36, 2249) 375.3
Residual	91	2212	0.04		Prob > F 0.000
Total	649	2248	0.29		R² 85.9
					R² adjusted 85.7
					Root MSE 0.203

Conclusion

The pioneering approach developed by the CIES Football Observatory in the field of the scientific evaluation of transfer values has a wide range of uses. Market actors avail of it for:

(1) Transfer negotiations

In a highly speculative context where fake information is often leaked by clubs, agents and the various media involved, it is very useful to base oneself on an objective value with which to define an opening price. The projection of future values can also be beneficial, notably when it comes to the negotiation of add-ons.

(2) Contractual negotiations

Thanks to the algorithm developed, it is possible to envisage likely scenarios on the future transfer values of players. This approach is particularly useful in defining the level of salary offered to a player without involving excessive risk or in determining the optimum length of a new contract.

(3) Transfer litigation

Our algorithm is highly suited to situations of litigation over transfer amounts. For example, in fixing an indemnity fee in case of a unilateral breach of contract on a player's part, when former clubs have a right to a percentage fee for players sold on or exchanged, as well as when footballers are entitled to a share of the fee for their own transfer.

(4) Credit negotiations

The objective and independent estimate of transfer values also proves useful when negotiating credits. Indeed, the transfer value of the squad constitutes a reliable indicator of the ability of a club to honour their engagements. This is not necessarily the case when credit worthiness is based on players' book value. A model assessing the fee paying transfer's probability was also developed.

(5) Taking out insurance

With the increase in transfer costs, it is becoming more and more worthwhile to take out insurance policies covering the possibility of the loss of value of a player, notably through injury. Thanks to our algorithm, we can monitor precisely the current and future values of players under contract.

(6) Club sale or purchase

For most of the teams worldwide, players are the major asset. An objective and neutral estimate of the overall transfer value of squad members is a key criterion to be considered when it comes to negotiate the buying or selling of a club.

Aside from any applications by market actors, our approach and independence allows us to bring more transparency and objectivity to transfer operations. Indeed, up until the present, no other organisation is capable of judging the validity of transactions on a robust and credible scientific basis. The growing recognition by actors in the game, the media and the public at large confirms the merits and interest of our approach.