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Pay and performance in the Spanish soccer league:
Who gets the expected monopsony rents?

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ABSTRACT

In the labour markets that gather few companies to compete for many workers, the economic theory predicts the existence of monopsony rents. It should also be the case of the Spanish soccer industry. However, the clubs of this league do not profit from the expected rents. The purpose of this paper is to explain such a contradictory evidence.

Spanish soccer labour market is characterised by the presence of some outstanding workers (soccer superstars). It means that the winner-take-all hypothesis holds when analysing the soccer industry. This idea states that being slightly better than the other workers generates large earnings differentials (escalating earnings of league superstars).

This paper considers the soccer industry as a dual labour market. One segment of this market could certainly be characterised by the traditional analysis of monopsony, in which a little number of clubs are willing to hire many potential candidates. The opposite occurs when studying the case of the superstar players. A number of entities (not just Spanish clubs) would fiercely compete for hiring those few superstars, who accumulate market power. The paper suggests that the monopsony rents that the clubs were to obtain from most of the soccer players, would eventually revert to the superstars, who enjoy strong bargaining power.

In order to empirically test this idea, the paper analyses the data of the Spanish professional soccer league, for the season 2001/02. The analysis pays especial attention to the economic impact associated to each particular player, as far as it may help to explain the large wage differentials that could not be explained due to performance differentials.

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1. Introduction

Much of the work on monopsony rents has been tested in the context of professional sports. Economic theory points to the exploitation of the professional sport players under the reserve clause, through the introduction of monopsony power. For instance, Rottenberg (1956) describes the clubs' monopsony power in the Baseball industry. This is also the case of the paper published by Scully (1974), who develops a basic theoretical framework and calculates the rate of monopsonistic exploitation for the US Major league Baseball.¹ He concludes that it is of considerable magnitude. Hunt and Lewis (1976) analyse empirically the same league and also claim that it exhibits monopsony rents for the teams owners.

Monopsony power is initially associated in the literature to the reserve clause. In this sense, Scully (1974) insists that cancelling the reserve clause would result in benefits for the players with no damage to the game.² However, some studies argue that certain monopsonistic exploitation will still remain once the clause had been removed, due to specific contractual arrangements. In fact, even though the player is allowed to play out his option and become a free agent, it is unlikely to happen. This is because the player could only switch to another team as far as the two teams agree on a transfer price.³

Another main policy issue, in the literature on professional sport markets, is the allocational effects that result from monopsony practices. El Hodiri and Quirk (1971) proved that the distribution of playing skills would be the same with or without the reserve clause. Also Hunt and Lewis (1976) argue that as long as property rights are well defined and reconstructing through sales of players' contracts is permissible and costless only the distribution of wealth between players and owners would be affected. According to this view, profitable investments in teams are still possible in the absence of monopsony rents, since monopoly profits remain. They justify the last assertion by simply considering the whole league (instead of the team) as a monopoly, rather than as an inefficient cartel.

At this stage, a second stream of arguments enters in the discussion. It is not infrequent that some markets support high concentrations of rewards among

¹ This rate is computed as the difference between the estimated Marginal Revenue Product and the salary, in terms of (divided by) the Marginal Revenue Product.

² In fact, the amount of money destined to reward soccer players is so large that there is no reason why lower earnings would not elude a comparable effort and performance from the players. In our opinion, the efficiency wage hypothesis is not the crucial issue here, since there are inherent incentives, other than those of monetary character, that persuade soccer players of doing their best.

small numbers of participants. Following the term settled by Frank and Cook (1995), we will refer to them as the winner-take-all markets. This hypothesis states that being slightly better than other workers generates that the winners get much larger earnings than the losers (the wages of the former exhibit a more than proportional magnitude with respect to the corresponding productivity). In a previous writing, Rosen (1981) referred to the phenomenon of *superstars*, “wherein relatively small numbers of people earn enormous amounts of money and dominate the activities in which they engage”.⁴ Frank and Cook claim that quite a large number of markets —like professional sports, pop culture, and arts— present a similar reward structure, in which many individuals compete for a handful of big prizes at the top. Perhaps the most novel argument alleged in their book is that socially wasteful patterns of competitive investment result from winner-take-all contests. In other words, they argue that too many resources are devoted to the competition itself and not enough to real production. Therefore, certain arrangements to restrict investments in *superstars* would be advisable.

They also stress that the case for excess competition is strongest when the activity is zero sum and when competition itself is worthless. If only rank order (not performance level) matters, the game is pure lotto and resources used to improve performance to gain competitive edge are wasted. A typical example of this sort of wasteful activities are the *Arms Race* between countries.⁵ Finally they point out that substantial inefficiencies result from market failures in contests. Furthermore, they consider that the winner-take-all phenomenon characterises a broad range of work activities in the US economy, so that it accounts for some of the increased income inequality.⁶

This paper aims to provide an answer for a contradictory evidence, which actually is only an outwardly contradiction. In the Spanish soccer league there are few teams to compete for many workers. (Including those young players coming from junior categories). In this situations the economic theory predicts the

³ The option payment is usually a huge amount of money.

⁴ Rosen (1981) also pointed out that “in certain kinds of activities there is concentration of output among a few individuals, marked skewness in the associated distributions of income and very large rewards at the top”.

⁵ Rosen and Sanderson (2001) say that professional sport markets experience a curious combination of cooperation and competition, which would be another variant of the *Arms Race* phenomenon.

⁶ The winner-take-all hypothesis, as stated by Frank and Cook, received some critical remarks in the review made by Rosen (1996). Firstly, he believe that the apparent abundance of *superstars* today is unrelated to the decrease in wages of unskilled labour that dominate inequality statistics. At least this correlation has not been empirically proved in the book. Secondly, Rosen considers that the relevance of the mentioned inefficiencies is greatly exaggerated, since the winner-take-all hypothesis would apply to a little number of markets and since “the book contains many examples, but is rather short on serious evidence.”

existence of monopsony rents.⁷ However, the clubs of this league do not profit from the expected rents. Moreover, the majority of the clubs in the Spanish league exhibits negative economic outcomes,⁸ which does not derive from a loss of potential revenues in the industry as a whole. In fact, as stated by Szymanski (2001), the increasing income inequality between clubs (and hence the unbalance of skill endowments) produces a negligible (if any) decline in competitive balance. In addition, and more importantly, there is no evidence at all that this feature has reduced the professional soccer league capability of producing revenues.⁹

This paper propose an original hypothesis, built upon the simultaneous analysis of both monopsony rents and winner-take-all elements. Naturally, in order to examine jointly these two aspects, it seems accurate to assume that Spanish soccer industry is a dual labour market. One segment of it could certainly be characterised by the conventional analysis of monopsony, in which a little number of clubs wish to attract many potential candidates. The majority of those are mediocre average candidates, whose instruction has often taken place in second-category teams. On the other hand, this market is also composed by the presence of a few outstanding workers (soccer *superstars*), so that the winner-take-all hypothesis clearly applies. A relatively larger number of entities (not only Spanish clubs) would fiercely compete for hiring those *superstars*, who accumulate market power.¹⁰

In summary, this paper suggests that the monopsony rents that the clubs were to obtain from most of the soccer players, would eventually revert to these *superstar* players, who enjoy strong bargaining power. In this context, when

⁷ Note that this is also the case even once the reserve clause was eliminated in 1995, at the time in which the Bosman law was introduced. Although it is true that this law brought a revolution in the European football labour market, we argue that monopsony power has persisted, as a result of other contractual arrangements. Before 1995, any club willing to hire a player had to pay a compensation fee to the former club even if the contract had expired. Hence, even out-of-contract players were not completely free to leave their employer. Moreover, the clubs were not allowed to employ more than three players coming from abroad. The clubs had strong bargaining power since they could prevent a player from changing team if they were not satisfied by the compensation fee. Since 1995, an out-of-contract player can freely negotiate with a team and does not have to pay any compensation fee to his former club. The clubs now anticipate this new ingredient and provide the players with incentives to sign long-term contracts. Any player willing to breach the contract in order to change club has to pay the compensation fee mentioned above. See: Ascari and Gagnepain (2003).

⁸ Deloitte & Touche (2003). Although this report presents no records of the evolution of team profits in the Spanish league for the last seasons, it is unquestionable that the industry is facing a big and growing deficit. This conclusion emerges from analysing the trend of the business as well as considering the escalating earnings of the footballers. In fact, the clubs integrated in the LFP (Spanish professional football league) admit a permanent economic crisis in the sector. In a letter sent by Juan José Hidalgo (vice-president of the Spanish LFP) to Mariano Rajoy (vice-president of the Spanish government), in April 2003, he manifested a debt of around 2.000 million Euros.

⁹ Szymanski (2001) concludes that from the analysis of the English Premier League.

¹⁰ Again, the *Arms Race* phenomenon among teams may help to explain the prevalence of *superstar* monopoly power in bargaining.

analysing the contribution that a soccer player implies for a team, especial attention will be placed upon his capability of generating economic revenues (achieved through broadcast rights, merchandising contracts, etc.) no less than upon his sport performance.

2. A basic theoretical framework

The introduction has been devoted to describe the motivation of the paper. In order to relate the issues that have been mentioned, a basic theoretical framework is required.

In some aspects, the starting point of the following model parallels the one presented by Scully (1974): a model of marginal revenue product and salary determination, in which the demand of some inputs is established in a monopsony framework. Remember that if the labour market were perfectly competitive, player salaries would be equated with player marginal revenue products (MRP); whereas it is not the case if the reserve clause (or other contract arrangements) restricts player bargaining to one owner. In the latter case, players and owners share the player's MRP.¹¹

Consider the player's MRP in the soccer industry. Let's presume that the inputs (skills) generate revenues from two sources: through individual performance (and its effect on team standing) as well as through merchandising activities. In addition, following the framework presented by Scully (1974),¹² the formal process of MRP and salary determination should incorporate a major feature: monopsonistic factors reduce skill rewards below player's MRP.

Most specifically, this paper assumes that soccer players endow a vector of talents. These talents can be grouped in two general types: ordinary or average skills (A_j) and *superstar* abilities (S_i). To determine the prevalent salary for the former type of inputs, a monopsonistic framework will be suitable. The case of the latter is different, since it is a very exclusive production factor. Therefore, no monopoly rents will be extracted from these *superstar* abilities.¹³ In

¹¹ Note that the Spanish professional football league, considered as a whole, can be seen as the unique provider of this type of spectacle. In this sense, it enjoys monopoly power. The Clubs engaged in such a industry would determine the monopsonistic wage acting as a cartel.

¹² He assumes slightly different hypotheses and states that: "The player's marginal revenue product in baseball is the ability or performance that he contributes to the team and the effect of that performance on gate receipts. The effect of player performance on revenue may be direct or indirect. Ability contributes to team performance and victories raise gate receipts and broadcast revenues; this is the substantial effect of the individual's performance. Additionally, it is possible that some players may attract fans over and above their individual contribution through the team."

¹³ This is why we have mentioned a segmented labour market. Note that it is not necessary the case that

order to attract the services of those outstanding talents, a fierce competition among teams takes place. This kind of *Arms Race* environment, in which some teams are involved, result in monopoly power on the part of the supplier of those *superstars* abilities.

Let's start by characterising the revenues. The team obtain earnings from two main sources: (i) the direct revenues (coming from performance and gate receipts, merchandising, etc.) and (ii) the share of the total industry profits, corresponding to each particular team (which will depend mainly on popularity, broadcast rights, etc.). Besides that, the analysis decomposes the earnings two groups: those linked to sport performance of an individual, and those generated by the merchandising power associated to each particular soccer player.

To analyse the decision problem faced by each team, it is necessary to previously define the expression of the profits for the industry as a whole. These profits are associated to the monopsony rents achieved by the unique agent placed in the demand side of the market. Remember that, even though the number of teams in the industry were relatively large, we assume that they all act as a unique decision unit in the market of average skills, in which they enjoy a predominant position. Consider, for instance, that teams form a cartel so that they agree to pay, in a monopsonistic framework, the wage for average skill that maximises profits. The revenues for the cartel could be defined by:

$$[2.1] \quad R_{ind} = R(f(A_i, S_j, \psi), m(A_i, S_j, \psi)), \quad \forall i = 1 \dots I \text{ and } \forall j = 1 \dots J.$$

Where f and m represent, respectively, the productivity related to performance and to merchandising capacity; and where the revenue function (R) depends on two kinds of productivity: the sport performance and the economic profitability associated to each particular skill. In addition, ψ accounts for a broad array of characteristics: league competitiveness, number of fans, etc.

On the other hand, the cost of hiring soccer skills is given by:

$$[2.2] \quad C = \sum_i wa_i^f(A_i) \cdot A_i + \sum_i wa_i^m(A_i) \cdot A_i + \sum_j ws_j^f \cdot S_j + \sum_j ws_j^m \cdot S_j$$

The wage have been split out in two elements: the salary to reward player performance contribution (w^f), and the payments associated to merchandising activities (w^m). Obviously, there are so many wages as the number of different

football players are placed in a monopsonistic market or in a competitive one. Instead, our view suggests that some skills are rewarded as in a monopsonistic framework, whereas the extraordinary abilities are not. Hence, there exists a dual labour market as regards as the type of skill considered.

skills of labour input. Note also that the two first terms of expression [2.2] correspond to labour inputs constrained to monopsony situations. Therefore, those wages are not fixed, but have been expressed as functions of the quantity of input that has been hired. In other words, there are monopsony rents associated to them.

Accordingly, total profits for the whole soccer industry can be defined by:

$$[2.3] \quad \Pi_{ind} = R \left(f(A_i, S_j, \psi), m(A_i, S_j, \psi) \right) \\ - \sum_i wa_i^f(A_i) \cdot A_i + \sum_i wa_i^m(A_i) \cdot A_i + \sum_j ws_j^f \cdot S_j + \sum_j ws_j^m \cdot S_j$$

Obviously, the problem consist of maximising the previous expression with respect to A_j . The first order conditions for this problem are defined by:

$$[2.4] \quad \frac{\partial \Pi}{\partial A_i} = 0 \Rightarrow \quad wa_i^f(A_i) + wa_i^m(A_i) = \frac{\partial R}{\partial f} \cdot \frac{\partial f}{\partial A_i} + \frac{\partial R}{\partial m} \cdot \frac{\partial m}{\partial A_i} - A_i \cdot \left(\frac{\partial wa_i^f}{\partial A_i} + \frac{\partial wa_i^m}{\partial A_i} \right)$$

$$[2.5] \quad \frac{\partial \Pi}{\partial S_j} = 0 \Rightarrow \quad ws_j^f + ws_j^m = \frac{\partial R}{\partial f} \cdot \frac{\partial f}{\partial S_j} + \frac{\partial R}{\partial m} \cdot \frac{\partial m}{\partial S_j}$$

These two equations reveal that the league as a whole maximise profits by selecting a level of player ordinary skills (A_i) such that players receive a salary equal to their marginal revenue products less monopsony rents (represented by the last term of equation [2.4]). In the case of outstanding abilities (S_j), they do not suffer from monopsonistic distortions, so that they are remunerated equal to their marginal revenue products.

In other words, these equations allow us to obtain the optimal amount of each type of ordinary skills to be hired in the industry, A_i^* , as well as the corresponding wages: $wa_i^f(A_i^*)$ and $wa_i^m(A_i^*)$. Similarly, it can be determined the total amount of the *superstar* abilities and its wage: S_j^* , ws_j^f and ws_j^m . Given that the wages associated to S_j are not linked to monopsony power, these skills are going to be rewarded according to their MRP, so that no profits are extracted from them: $\Pi_{ind}^S = 0$. The opposite occur with the average abilities, so that there exist extraordinary profits (monopsony rents) associated to them. Specifically, these rents (denoted by Π_{ind}^A) are expected to be strictly positive:

$$[2.6] \quad \Pi_{ind}^A = A_i^* \cdot \left(A_i^* \cdot \left(\frac{\partial wa_i^f}{\partial A_i} + \frac{\partial wa_i^m}{\partial A_i} \right) \right) > 0$$

Once the profits of the whole industry has been calculated, a further problem raises: to determine the amount of S_j that each club is willing to hire.

At this stage, we assume that the objective function to be maximise by each team (n) is the production of soccer spectacle, rather than the profit. We consider the production function to depend on the following variables:

$$[2.7] \quad f_n = f_n\left(\frac{\sum A_i^*}{N}, S_n, \varphi\right) \quad \forall n = 1 \dots N$$

Where φ accounts for an array of team characteristics and peculiarities. By assuming that all the teams require the presence of the same number of players, the amount of ordinary inputs (the proportion of all kinds of ordinary skills that corresponds to each team) is going to be the same for all the teams.

On the other hand, given that there exists a positive relationship between *superstars* inputs in the team (S_n) and the production of soccer spectacle, the later will be maximised as far as the former will. In other words, the objective of maximising expression [2.7] will eventually happen when S_n is maximised. Obviously, the team does not wish to incur in deficit (at least in the long run). Hence, the optimisation problem can be characterised by:

$$[2.8] \quad \begin{aligned} & \text{Max}_{S_n} f_n = f_n\left(\frac{\sum A_i^*}{N}, S_n, \varphi\right) \\ & \text{subject to: } \Pi_n = \alpha_n\left(\frac{S_n}{S^*}, \varphi\right) \cdot \Pi_{ind}^A + E_n(f_n(S_n), m_n(S_n), \varphi) - (wS^f \cdot S_n + wS^m \cdot S_n) \geq 0 \end{aligned}$$

In this maximisation problem the constraint will drive a major role, since each particular team is willing to spend all its extraordinary profits, when hiring *superstar* talents.

The first term of the constraint accounts for the portion of the profits, achieved by the industry as a whole, that correspond to each particular team. This amount is defined by the product of two elements: the proportion of earnings that correspond to each team, $\alpha_n(\cdot)$, and the total revenues generated by the whole industry, Π_{ind}^A . As stated in the constraint of expression [2.8], the former factor depends basically on the special talents hired by the team (S_n), with respect to the total *special* abilities in the league. The latter element has already been calculated and is considered as given. There is another source of revenues

that enters into the profit function of each particular team, and that also depends primarily on S_n . These additional earnings have been denoted by: $E_n(\cdot)$.

We expect both $\alpha_n(\cdot)$ and $E_n(\cdot)$ to present a positive first derivative with respect to S_n . In addition, as long as the second derivatives have a negative sign, the optimal amount of S_n , for each particular team, can be identified. The result is straightforward: the team rewards the outstanding skills by simply paying all the available resources that it possesses. Given that the wage paid for each unit of S_n is fixed, the clubs hire a different amount of this factor depending on their financial status. The total wage bill the team devotes to this type of skills is:

$$[2.9] \quad WB_n = (ws^f + ws^m) \cdot S_n = \alpha_n\left(\frac{S_n}{S^*}, \varphi\right) \cdot \Pi_{ind}^A + E_n(f_n(S_n), m_n(S_n), \varphi)$$

Expression [2.9] states that the club n establishes a wage bill equal to the revenue that it directly achieves from the *superstars* skills plus the proportion of league profits that corresponds to the team. The key issue here is that such proportion will be strongly influenced by the higher or lower presence of special skills. Alternatively, this result could be read in average terms: the club will hire the amount S_n such that the wage per unit equals the average revenue. The team would not hire more than that, unless it does not care about deficit.

In the context of factual player contracting, each and every team will desire to enrol a somehow *superstar* player, who will receive extraordinary rewards (rents). In specific, we expect that rich teams will get big *superstars* and poor clubs small ones. This behaviour hinges on the fierce competition that clubs maintain in order to get the best players. In any case, this kind of *Arms Race* between clubs results in a strong bargaining position on the part of the suppliers of *superstars* skill.

The last step consist of analysing the point of view of the *superstars* players. For the sake of simplicity, we assume that each individual (g) endows a certain amount of the same type of *superstar* ability: $S_g, \forall g = 1 \dots G$. The problem consist of matching clubs (which are also lined up according to an economic criteria) to *superstar* players, so that their specific interest meet each other. Of course, the players enjoy a stronger bargaining position, so that they will choose the team which, in accordance with this model, offers them greater rewards. The foreseeable outcome of this matching problem is that best players will enrol the richest clubs. This is the reason why we consider them the winners of the market

(to whom the winner-take-all hypothesis is applied). The previous description could be expressed in a formal manner by means of the following expression:

$$\begin{aligned}
 [2.10] \quad & \underset{n}{\text{Max}} \quad (ws^f + ws^m) \cdot S_g \\
 & \text{subject to:} \quad (ws^f + ws^m) \cdot S_g \leq (ws^f + ws^m) \cdot S_n
 \end{aligned}$$

Even though the problem has been formulated in a continuous form, the factual matching decision takes place in a discrete framework, implying limitations, that are commonly associated to real individuals. In fact, each soccer player gathers a set of skills and, if hired, he should be reward for each and every of them. Hence, the total rewards received by a soccer player will comprise the previously determined market salaries. In the case of certain *superstar* players, they may accumulate characteristics that are outstanding abilities, as well as those average skills. Also the *superstar* players will be underpaid as regards normal skills, which are constrained to monopsony power; but they will certainly be compensated by the huge amounts of money they receive from the special abilities, which eventually will overcome the monopsony rents that they were deprived. This situation would not affect to the majority of the soccer players, who do not endow such outstanding skills, so that the monopsony rents extracted from them would eventually enrich the pockets of these few *superstars*.

3. Description of the variables and data source

In order to empirically test this issue, the paper analyses the data of the Spanish professional soccer league, for the season 2001/02.¹⁴ The analysis pays especial attention to the economic impact associated to each particular player, as far as it may help to explain the large earnings differentials that could not be explained due to sport performance differences.

The data source for this study is the sports journal: MARCA. In specific, most of the information has been obtained from: Guía MARCA (Liga 2003) and Guía MARCA (Liga 2002). The latter has been used to complement those pieces of information that were not recorded in the former. In spite of this recovery procedure, it was impossible to avoid the loss of a large number of observations, due to lack of information on some aspects of the players. The observations for

¹⁴ For a general knowledge of the type of industry which is going to be empirically examined, it may be helpful to read: Ascari and Gagnepain (2003), as well as: Hoehn and Szymanski (1999).

which all the information was available were reduced from 518, the number of those registered in the league, to 370 individuals.

The most important variables included in the analysis are the dependent variable plus three explanatory variables, which constitute the nucleus of the analysis. It also incorporates a number of variables to account for a broad array of characteristics of each soccer player. The dependent variable is designated as (notario) and represent the estimated market value of a soccer player. As no public information is available about payrolls and other sources of soccer player's earnings, we use (notario) as a "proxy" variable of that market value. It tries to evaluate the amount of money that a club is willing to pay for the service of a certain soccer player, and has been collected from *diario MARCA*, the main sports daily journal.¹⁵

Two "proxy" variables of worker productivity will be used in the study: an index of performance measured by the "puntos Marca" (PuntosMarca);¹⁶ and another alternative index of productivity evaluated through "liga Fantástica" (LigaFantastica).¹⁷ Obviously, these two indexes will not be introduced together in the same regression since, as far as they try to capture the same reality, they will undoubtedly be correlated.

Another principal issue here is to size up the economic profitability that a soccer player reports to his club. Certainly, as it was pointed out in the previous section, the economic factors in this context play a central role, which might be even more important than the sport performance contribution of the player. A simple and accurate way of evaluating the capability that a player possesses of generating economic revenues (through broadcast rights, merchandising contracts, etc.) is constructing an homogeneous ranking to line up all the individuals. To this aim, a "proxy" variable designed by (Google) has been selected. It comprises the total number of links reported by the internet searching

¹⁵ In particular, it is reported in the issue printed in the 27th September 2001. The market value of a soccer player is established by a board of experts, that meets under official supervision. They accord the accurate value of the individual, both relying on the quality of the player and depending on the economic cost of getting his job services. This index is provided to the readers by MARCA in order for them to elaborate a hypothetical team, which will compete in the game: "Liga Fantástica". For the very few cases in which the rank was not complete for this year, we have taken the value reported for the following season (Cf. *diario MARCA*, 22.IX.2002), after checking the consistency of the information.

¹⁶ It consists of a cumulative rank, elaborated upon the records that journalists assign to each soccer player after the game. At the end of the season, an accurate ranking can be obtained with the sum of the points granted to each individual along the league. This index is certainly a natural measure of productivity, including even aspects that can hardly be quantified, like the elegance of the game and the attitude of the footballer in the field, etc.

¹⁷ This alternative index is computed by adding quantifiable indicators on play performance in addition to the score given by the journalists. It means that the ranking provided by (LiguaFantastica) enriches and encompasses that of (PuntosMarca). The shortcoming of this index comes from the fact of the

engine provided by Google.¹⁸ The foreseeable multicollinearity between (Google) and the indexes of performance, requires from the former variable to be filtered before entering the regression. The procedure to get this refined variable will be explained later.

There is still a third essential explanatory variable in the analysis. It target to prove whether the winner-take-all hypothesis holds or not in the labour market of Spanish professional soccer players. The most simple manner of testing this feature is by means of a "dummy" variable, that takes the value 1 for the case of the few winners of the market (soccer *superstars*), whereas it takes the value 0 for the other individuals. The name reserved for this qualitative variable is (Winner-take-all).

There are also a number of variables to control for different factors: (deurope) to account for the number of games that have taken place in the Champions League or in the UEFA Cup; (international) that quantifies the number of games in which a player has defended the own national team. The age is relevant as well in this context, and, as it is conventional, has been introduced into the model adopting a quadratic form: age (age) and age² (age2). In addition to that, the empirical estimation will incorporate a "dummy" variable for the foreign non-European players (extra); and for foreign players who belong to the European Union (comunit).

Finally, we use three "dummy" variables associated to the field position of soccer players: defenders (defen), midfielders (midfi) and attackers (attac). Obviously, goalkeeper acts as the reference group. These "dummy" variables are useful to control for the position of the players in the field and fulfil the unquestionable role of controlling the heterogeneity associated to player's field position. The importance of these "dummy" variables relies on the fact that the indexes of performance employ the same criteria for all the soccer players, no matter their particular demarcation in the pitch. However, it is unclear that one could compare through these indexes the performance of a goalkeeper with that of a midfielder.¹⁹

arbitrary way to weigh up each quantifiable indicator.

¹⁸ The specific values associated to each footballer were those that resulted of including in the search: "name of the player" AND "name of the corresponding team" AND "football". (The last element was written in the most common languages in which soccer has a popular support). This rank was computed for all the observations in May 2003.

¹⁹ To illustrate this difficulty, observe the annual average for each field position, according to the average value of the (LigaFantastica) index. It takes the following values: goalkeepers (2.01); defenders (2.36); midfielders (2.28); and attackers (2.36). As regards to the index (PuntosMarca) the annual average is: goalkeepers (1.39); defenders (1.20); midfielders (1.24), forward players (1.19).

4. Empirical results

As it has already been said, the aim of this paper is to provide an explanation of the determinants of the monetary rewards received by soccer players, who participate in a labour market of a special nature.

The baseline model considers that all inputs in the supply side of the labour market are under an homogeneous pay system. Even if the theoretical model has been designed to be applied to skills or abilities of soccer players, the empirical study has to be implemented on the analysis of individuals, as far as they are the actual agents that interact in the market.²⁰ The monetary valuation of these agents are linked to the sources of revenues they generate to their teams: their sport performance, but also their contribution to sources of revenues coming from the fans support traduced into soccer team sales.

Sport performance of each single soccer player is captured through two alternative composite values described in the precedent section: (PuntosMarca) and (LigaFantastica). The contribution of each soccer player to their team revenues through merchandising related sales is measured by their individual presence at internet, with the number of sites where they appear, according to the web searcher Google. This proxy variable was denoted as (Google).

We cannot directly introduce the Google variable into the explanatory model of soccer payment, as we can suspect a strong problem of interdependence between players' *renommée* (Google) and the measure of sport performance (PuntosMarca or LigaFantastica), inducing clear risks of multicolliniarity. We consider then necessary to filter the initial measure of soccer players' internet presence (Google) against all the factors related with individual sport performance and other measurable individual characteristics, like age, nationality or position in the game field. We will use the residuals of this regression as a filtered measure of strict non sportive value (FilteredGoogle) generated by the soccer player by his public exposure. This contribution should be taken into account in the payment scheme if the sport labour market is not far from efficiency.

The results of the mentioned filtering procedure are not going to be displayed, since they are a mere devise to produce the (FilteredGoogle) variable,

Hence, it is quite obvious that the goalkeepers presents a differential character.

²⁰ The precedence adopted to move from one unit of analysis (skills) to the other (individuals) would simply require to be able of gathering the array of skills that an individual endows and for which he must be rewarded.

which is going to be used as one important explanatory variable of the soccer player payment scheme. However, it is interesting to note that, for the baseline model, the adjusted R-squared of the corresponding (Google) regression is slightly above 0.50. It means that an important share of the soccer player presence in internet cannot be explained exclusively by sport performance considerations, which reinforces our intuition of incorporating a measure of economic impact of the players, when analysing and determining the payment system.²¹

Let's move into the analysis of the determinants of our baseline model, using the filtered measure of Google (FilteredGoogle), together with the variables capturing sportive performance and some other control variables for specific characteristics. The results are shown in Table 1.

TABLE 1.

The results concerning the baseline model are presented in columns (1) and (2). In this model we suppose that all soccer players share substantially similar labour assets and, consequently, are paid according their individual contribution to the team income, in a functional relationship that we approximate by the assumption of linearity. As explained in the previous section, we think of these market as a monopsonistic one, so that monopsony rents are extracted from the players' MRP. The explanatory power of the model is substantially high, as the adjusted R-squared is 0.786 in both regressions.

We find, as expected, that sportive performance, either measured by (PuntosMarca) or by (LigaFantastica), is a main explanatory factor of soccer player's economic valuation. The public exposure of players (FilteredGoogle) seems to appear as the major ingredient to determine soccer players' payment. We consider this result one of the most relevant findings of the paper.

Another interesting result is that players having played matches with the national selection experience a higher economic reward. This is the net effect, because players' actual sport contribution though their performance has already been captured through (PuntosMarca) or (LigaFantastica). Playing matches in

²¹ Even if it is marginal to the main goal of the paper, we wish succinctly mention that internet presence depends, in a statistically significant way, on the soccer player sport performance (either measured by PuntosMarca or by LigaFantastica). It also depends on the number of matches played in international competitions, at teams level (deurope), as well as at country level (international). The nationality seems not to have a decisive impact; if any, it is negative for foreign players from outside Europe (ext). Neither does the age affect in any sense their presence in internet. For which regard soccer player demarcation, only the overexposure of attackers is statistically significant.

international competitions, like the Champions League and the UEFA Cup (deurope), generates as well a positive signal, from which the player takes an economic advantage. According to our data set, we do not find any evidence of payment discrimination because of nationality or being European, neither positive nor negative, in contrast with commonplace comments in the Spanish sport circles on this issue.

The influence of age, which also relates experience, is introduced into the regression in the conventional quadratic form and informs of a pronounced increase in earnings in the middle part of the career. This relationship between economic valuation and age is typically for sport labour markets.

Concerning the influence of players' demarcation on economic valuation, we can observe that, with respect to goalkeepers (who are the reference group), the valuation of attackers and, to a certain extent also that of midfielders, receive much higher attention and pay. Remind that this regression has already tried to capture the sportive contribution of each player through their performance. We find that, regardless which of the two alternative measures of sport performance is used, attackers are systematically overpaid.²²

Finally, it seems that Real Madrid rewards their players more than it would be expected, at least as regards the usual practices of other Spanish clubs.

At this stage, we are ready to tackle another central issue of this study: checking the presence of the Winner-take-all hypothesis in the Spanish soccer labour market. In order to do that, we propose to retrace the model incorporating a couple of "dummy" variables, in the following manner. The Winner-take-all hypothesis refers to the presence of some *superstars* that, due to their sportive or personal characteristics, become unique and succeed in attracting the attention of fans and the media in general. Their popularity allow them to be decisive for the global sportive performance of the team and/or to generate important amount of revenues through higher attendance, television share and merchandising sales. For those soccer *superstars*, we expect that the normal linear relationship, that we had established between pay and performance, does not hold anymore. The eventual marginal higher level of sport performance that those players represent should then be associated with a significant positive jump in their economic valuation.

²² This may be a first hint that the implicit hypothesis of the baseline model is unsatisfactory, as we do not have in fact an homogeneous group of supply of labour in the soccer market

Our proposal is to indirectly identify those *superstars* by matching the higher extreme values of (Google). In accordance with the suggestions of the theoretical framework, we have created two different "dummy" variables. The first variable gathers the players that are considered *league superstars*: those who have the higher internet coverage within the Spanish league (because of the digital press, the fans' sites, etc.). This variable is denoted by (Winner-take-all). On the other hand, another "dummy" variable to account for the best soccer player in each team has been constructed (the best in terms of the Google index). We have named the variable collecting all the *team superstar* by (Team-winner).²³

Figure 1 plots the (Google) values for the 369 Spanish soccer players, ordered by the Google ranking. Annex 1 provide the individual values for each and every player. The players with less than 8.000-10.000 web appearances in Google seem to belong to a common group. There are 5 clear outliers (there is a clear jump) and another 10-20 players following a special path.²⁴ These features can be observed in Figure 1, that includes several graphs in which a certain number of the *superstars* are successively left aside.

FIGURE 1

Taking all these elements into account, we have decided to introduce the winner-take-all effect by simply using active "dummies" for the extreme higher values of Google. The baseline model has been encompassed by introducing the mentioned variables: (Winner-take-all) and/or (Team-winner). For which regards the former, the exact number of *superstars* identified is evidently a matter of choice. We have run several regressions (in addition to those of the baseline model) using three different level of elitism: a set of 5, 10 or 20 soccer players. Table 1, in columns (3) and (4), presents the results of the preferred model. By comparing these results to those in columns (1) and (2), one can conclude the crucial role of the Winner-take-all hypothesis in this particular labour market. In particular, the estimations of columns (3) and (4) correspond to the regressions that include simultaneously (Team-winner) and (Winner-take-all) for the case of restricting the dummy sample to the 5 players with higher Google presence.

²³ We did also test the Winner-take-all hypothesis by means of creating "dummy" variables related to the indexes of sport performance. The corresponding results were substantially similar to those that we present. In particular, the results were more satisfactory for the case of (LigaFantastica) than for the case of (PuntosMarca). Anyway, as far as the variable used to construct the "dummies" was Google (instead of FilteredGoogle), the chosen procedure to identify winners has simultaneously into account the sportive performance as well as the economic impact of the players.

²⁴ This feeling is reinforced when we plot the same data but using a logarithmic presentation of the Google values, since even in this case the uncommon path of the top 5 soccer players remains.

In summary, the examine of columns (3) and (4) in Table 1 teaches us that, regardless the measure chosen to capture sport performance (PuntosMarca or LigaFantastica), the scission of the market of soccer players into two groups is meaningful. This conclusion emerges from the analysis of the estimated coefficient for the two "dummies" that have been devised to capture the Winner-take-all element. The size of the coefficient of (Winner-take-all) is considerable, and it is strongly statistically significant (t-statistic above 33 in the two regressions). It means that the selected group of 5 *league superstars* appears to receive a positive additional extra payment (compared with the remaining 364 soccer players of the data set). This fact holds too for the case of the 18 *team superstars*,²⁵ even if the t-statistics (3.91 when using PuntosMarca; 3.69 for the case of LigaFantastica) are not as big as those corresponding to league superstars. Naturally, the strength of these results hinges on the fact that the estimated model has already taken into account the (FilteredGoogle) values, as well as the performance records, of the players.

Table 2 presents the estimations of the regressions that use only one variable related to the Winner-take-all element. These results are also interesting, although we prefer the model presented in columns (3) and (4) of Table 1, due to theoretical and empirical considerations.

TABLE 2.

On the other hand, Table 3 shows that the special salary treatment provided to *superstars* still remain when we enlarge to 10 or 20 the number of *league superstars* considered. However, this fact become smaller each time that the size of the number of superstars status is increased.²⁶

TABLE 3.

These results push us to conclude the existence of two segments in the labour market supply. Top renowned players receive an increase in salary which is out of proportion to the marginal increase of sportive and economic contribution that they provide to their team. We acknowledge here the presence of the winner-take-all effect. The presence of this effect in the Spanish soccer league can thus

²⁵ There are 18 teams represented in the data set. On the other hand, the 5 *league superstars* in that season, as far as (Google) records concern, are: Raul, Zidane, Figo, Roberto Carlos and Rivaldo.

²⁶ The coefficient when the number of superstars are 5, ranges between 55.51 and 55.85 (with a t-student around 33). If the selection of superstars is increased to 10 members, then the coefficient is between 29.95-30.31 (t-student about 18). Finally, if we select 20 superstars, the overpayment given to

help us to understand why most teams are not able to produce extraordinary profits even if the global structure of the market allows them in principle to create monopsony rents.²⁷ Empirical results are in line with our theoretical intuition that an important share of the eventual monopsony rents, captured from ordinary soccer players, are absorbed in a second moment by those few soccer *superstars* with strong bargaining power.

The addition of the winner-take-all test in the econometric specification affects some of the other results reached with the baseline model. The influence of age (age and age2) in salary conditions disappears (is not significant) for the case of just 5 *superstars*, but still remain when (Winner-take-all) is defined for 10 and 20 players. The overpayment due to participating in European championships (deurope) remains significant if the sample is reduced to 5 *superstars*, but is not anymore significant in the model with 20 *superstars*.

Other results continue to appear in close relationship with economic valuation. Playing for the national team in international games (international) produce always a favourable bias on salary conditions. Attackers (attac) are systematically overpaid with respect to goalkeepers. Even if we show in the paper that some teams over or underpay their players in comparison with Spanish standards, this result is not absolutely robust, as it varies according the size of the selected *superstars* membership. Nevertheless, taking into account all the results, we dare to assert that Real Madrid, Valencia and Deportivo overpay their players. Finally, note that the influence of public exposure (FilteredGoogle) on salaries is maintained, and is a determinant piece of the payment scheme in the soccer market.

those players oscillates between 13.61 and 14.15 (t-student around 15).

²⁷ Situation that certainly survive as far as the soccer league enjoys a monopoly situation as provider of soccer entertainment services in Spain.

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Table 1 . Explaining Soccer Players' Economic Valuation

Dep.Variable: Notario	Monopsony Model		Winner-take-all (5) + Team-winner	
	PuntosMarca	LigaFantastica	PuntosMarca	LigaFantastica
Variable	(1)	(2)	(3)	(4)
Winner-take-all			55.856 *** (33.44)	55.517 *** (33.25)
Team-winner			3.3066 *** (3.91)	3.1198 *** (3.69)
PuntosMarca	4.7697 *** (8.06)		2.9561 *** (6.46)	
LigaFantastica		2.9018 *** (9.19)		1.6794 *** (6.84)
FilteredGoogle	1.2266 *** (24.07)	1.2224 *** (23.68)	0.3687 *** (5.42)	0.3532 *** (5.16)
deurope	0.3623 *** (4.50)	0.3268 *** (4.08)	0.4285 *** (6.95)	0.4033 *** (6.60)
international	0.1662 *** (10.69)	0.1623 *** (10.44)	0.0476 *** (3.85)	0.0475 *** (3.86)
comunit	-0.0798 (-0.32)	-0.1564 (-0.63)	-0.1723 (-0.92)	-0.2142 (-1.14)
ext	-0.7200 (-1.30)	-0.5500 (-0.99)	-0.5143 (-1.22)	-0.4333 (-1.03)
age	1.3428 * (1.91)	1.3363 * (1.91)	0.7419 (1.37)	0.7366 (1.36)
age2	-0.0249 ** (-2.08)	-0.0253 ** (-2.11)	-0.1312 (-1.42)	-0.0133 (-1.44)
defen	-0.2592 (-0.31)	-1.2691 (-1.53)	-0.2326 (-0.36)	-0.8571 (-1.35)
midfi	2.1809 ** (2.59)	1.1710 (1.40)	1.6214 ** (2.51)	1.0035 (1.57)
attac	5.7517 *** (6.15)	4.3676 *** (4.75)	4.0416 *** (5.60)	3.2097 *** (4.55)
Deportivo	-1.7262 (-1.49)	-1.9220 * (-1.66)	-1.2781 (-1.44)	-1.3540 (-1.53)
Español	2.0855 (1.52)	1.5691 (1.14)	1.9876 * (1.89)	1.6588 (1.59)
RealMadrid	6.1216 *** (5.02)	5.7951 *** (4.75)	-1.2255 (-1.28)	-1.3571 (-1.42)
cons_	-18.679 * (-1.83)	-16.973 * (-1.66)	-9.6533 (-1.22)	-8.4350 (-1.07)
R-Squared	0.802	0.802	0.885	0.886
Adj R-Squared	0.786	0.786	0.875	0.876
F Stat	51.12 ***	51.18 ***	90.00 ***	90.57 ***
N. Obs	369	369	369	369

Table 2 . Explaining Soccer Players' Economic Valuation

Dep.Variable:	Winner-take-all (5)		Team-winner	
Notario	PuntosMarca	LigaFantastica	PuntosMarca	LigaFantastica
Variable	(1)	(2)	(3)	(4)
Winner-take-all	56.926 *** (34.31)	56.482 *** (34.04)		
Team-winner			7.9309 *** (7.26)	7.5303 *** (6.87)
PuntosMarca	3.1788 *** (6.95)		4.1640 *** (6.97)	
LigaFantastica		1.8147 *** (7.43)		2.5302 *** (7.89)
FilteredGoogle	0.4105 *** (6.21)	0.3924 *** (5.88)	1.2203 *** (22.95)	1.2167 *** (22.66)
deurope	0.4165 *** (6.72)	0.3905 *** (6.36)	0.3935 *** (4.88)	0.3604 *** (4.49)
international	0.0512 *** (4.12)	0.0507 *** (4.11)	0.1525 *** (9.73)	0.1500 *** (9.57)
comunit	-0.1905 (-1.01)	-0.2350 (-1.24)	-0.0411 (-0.17)	-0.1094 (-0.44)
ext	-0.4220 (-0.99)	-0.3375 (-0.80)	-0.9279 * (-1.68)	-0.7725 (-1.39)
age	0.4398 (0.81)	0.4515 (0.84)	2.0266 *** (2.86)	1.9879 *** (2.81)
age2	-0.0083 (-0.91)	-0.0088 (-0.96)	-0.0355 *** (-2.94)	-0.0353 *** (-2.92)
defen	-0.3478 (-0.54)	-1.0111 (-1.58)	0.0131 (-0.02)	-0.8867 (-1.06)
midfi	1.5851 ** (2.44)	0.9244 (1.44)	2.2411 *** (2.66)	1.3517 (1.61)
attac	4.4113 *** (6.13)	3.4981 *** (4.96)	4.8046 *** (5.09)	3.6357 *** (3.92)
Deportivo	-1.1173 (-1.25)	-1.2136 (-1.36)	-2.0844 * (-1.79)	-2.2317 * (-1.92)
Español	1.9986 * (1.89)	1.6467 (1.56)	2.0553 (1.49)	1.6014 (1.17)
RealMadrid	-1.2984 (-1.35)	-1.4359 (-1.50)	5.9620 *** (4.48)	5.6869 *** (4.65)
cons_	-5.0181 (-0.64)	-3.9957 (-0.51)	-29.181 *** (-2.83)	-27.152 *** (-2.63)
R-Squared	0.883	0.884	0.802	0.802
Adj R-Squared	0.873	0.874	0.786	0.786
F Stat	91.77 ***	92.49 ***	49.28 ***	49.30 ***
N. Obs	369	369	369	369

Table 3 . Explaining Soccer Players' Economic Valuation

Dep.Variable: Notario	Winner-take-all (10) + Team-winner		Winner-take-all (20) + Team-winner	
	PuntosMarca	LigaFantastica	PuntosMarca	LigaFantastica
Variable	(1)	(2)	(3)	(4)
Winner-take-all	30.3121 *** (18.43)	29.956 *** (18.13)	14.156 *** (11.43)	13.614 *** (10.94)
Team-winner	6.7096 *** (6.19)	6.5065 *** (5.98)	6.2433 *** (5.81)	6.0510 *** (5.61)
PuntosMarca	2.9119 *** (4.89)		3.7900 *** (6.49)	
LigaFantastica		1.6674 *** (5.19)		2.1231 *** (6.75)
FilteredGoogle	1.0740 *** (14.33)	1.0711 *** (14.22)	1.3982 *** (21.01)	1.3946 *** (20.96)
deurope	0.1853 ** (2.30)	0.1632 ** (2.03)	0.0763 (0.91)	0.0560 (0.68)
international	0.0481 *** (2.91)	0.0485 *** (2.94)	0.1051 *** (6.64)	0.1064 *** (6.74)
comunit	0.0865 (0.35)	0.0423 (0.17)	0.0996 (0.41)	0.4100 (0.17)
ext	-0.3978 (-0.73)	-0.3196 (-0.58)	-0.1739 (-0.32)	-0.1029 (-0.19)
age	1.8355 *** (2.62)	1.8237 ** (2.60)	2.0804 *** (3.01)	2.0653 *** (2.99)
age2	-0.0316 *** (-2.64)	-0.0318 *** (-2.65)	-0.0360 *** (-3.05)	-0.0362 *** (-3.07)
defen	-0.3749 (-0.45)	-0.9896 (-1.20)	0.4619 (0.56)	-0.3550 (-0.44)
midfi	1.7484 ** (2.09)	1.1395 (1.37)	2.2807 *** (2.77)	1.4843 * (1.81)
attac	3.4978 *** (3.73)	2.6873 *** (2.92)	4.3014 *** (4.67)	3.2456 *** (3.59)
Deportivo	2.0944 * (1.78)	1.9727 * (1.68)	2.8580 ** (2.35)	2.5865 ** (2.13)
RealMadrid	5.8611 *** (4.85)	5.6877 *** (4.70)	7.8661 *** (6.54)	7.5737 *** (6.29)
Valencia	3.0386 *** (2.70)	2.7307 ** (2.42)	2.6768 ** (2.37)	2.2193 * (1.96)
cons_	-25.578 ** (-2.50)	-24.292 ** (-2.38)	-30.324 *** (-3.01)	-28.592 *** (-2.84)
R-Squared	0.806	0.806	0.812	0.812
Adj R-Squared	0.790	0.790	0.796	0.796
F Stat	48.79 ***	48.77 ***	50.63 ***	50.75 ***
N. Obs	369	369	369	369

FIGURE 1.



