

The exploitation of talent

Nicolaj Allan Christiansen

Sports Economics Seminar, Department of Economics, University of Copenhagen,

E-mail: nicolajchristiansen@gmail.com

Hans Henrik Sievertsen

Sports Economics Seminar, Department of Economics, University of Copenhagen,

E-mail: hhsievertsen@gmail.com

SUMMARY: This article is a review of the seminar paper Superstar Effect in Italian Football which was written for the seminar on sports economics at the Department of Economics, University of Copenhagen and awarded the McKinsey Award in spring 2008. Only the main findings from the seminar paper will be presented here. For details and technicalities we refer to the original seminar paper Christiansen and Sievertsen (2008), which can be downloaded at www.econ.ku.dk/nf/superstareffect.pdf.

In short, superstar economics is the branch of labour economics that deals with the phenomenon of nonlinear and highly rightskewed income distributions, that is observed in certain activities. The puzzle is, that the most talented individuals in these activities can obtain extremely high salaries compared to their colleagues, even though they are only marginally more talented. Theoretical explanations of the puzzle are reviewed and the superstar phenomenon is analysed empirically on Italian football, where a significant superstar effect is found.

1 Introduction

According to standard neoclassical economic theory, people are paid according to their marginal contribution to welfare, ie. to firm output. Assuming that the distribution of talent/productivity among workers within any given activity should be fairly uniform one would expect a linear function of talent and thus a linearly increasing function of income among workers. It is therefore puzzling, when investigating income distributions in general, to observe the following fact: In certain activities a few talented people earn wages that are extraordinarily high compared to the wages of their colleagues, contradicting standard neoclassical economic theory. In these activities it is typical to observe an exponentially growing income function rather than an expected linearly growing income function. Figure 1 presents an illustration of the phenomenon

Many individuals assisted us with both the seminar paper and this review, we thank each of them. All remaining errors are our own responsibility.

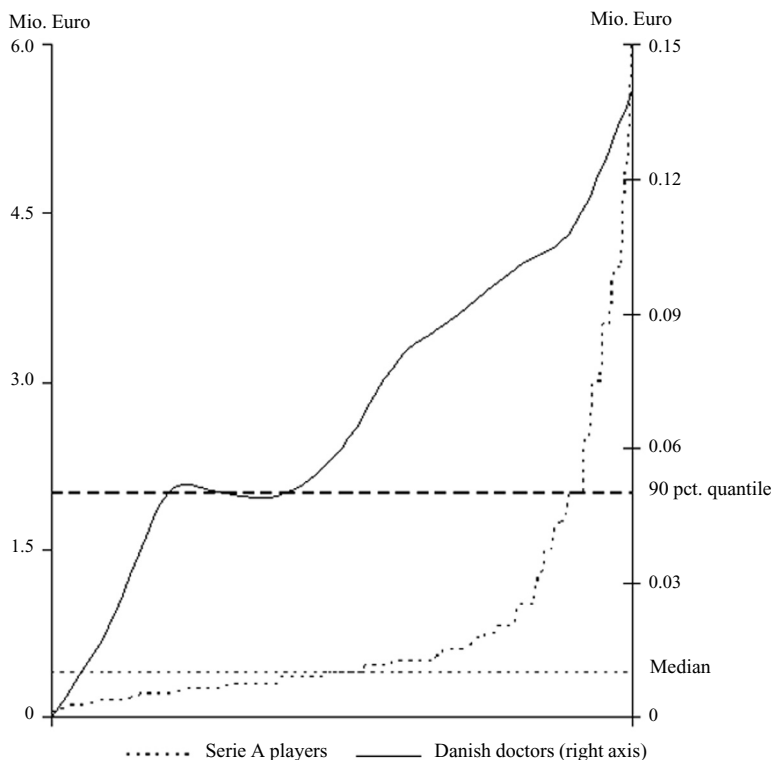


Figure 1. The wage of Danish doctors and players in the Italian Serie A.

Source: La Gazzetta dello Sport and Statistics Denmark.

Note: The wage data for the Danish doctors are from 2006 while the wage data for the Italian soccer players are from 2007. This, however, does not matter as we are only interested in the distribution and not the level of the wages. Median and 90 percent quantile refers to Serie A players.

by plotting income distributions of Danish doctors and football players from the Italian Serie A.

The exponentially growing income among the football players illustrates the superstar case, while the roughly linearly growing income function of the doctors represent the standard case as it would be expected from neoclassical labour economics.

2 Review of theory

Obviously, to explain the superstar phenomenon, we must look beyond standard labour economics. One of the most cited and important papers regarding the superstar phenomenon is »The economics of Superstars« Rosen (1981). In this paper Sherwin Rosen described the phenomenon as follows:

»The phenomenon of Superstars, wherein relatively small numbers of people earn enormous amounts of money and dominate the activities in which they engage, seems to be increasingly important in the modern world [...] In certain kinds of economic activity there is concentration of output among a few individuals, marked skewness in the associated distributions of income and very large rewards at the top«. [pp. 845].

Now, more than 25 years later, it seems that the phenomenon has become much more apparent and even more important than in the days of Rosen. Specifically, the Internet has provided easy access to the activities in which superstars engage, and media coverage in general has increased tremendously as well. Actors, musicians, athletes, writers, software producers, etc. are renowned to have extremely high incomes, and it seems that their earning capacities continue to grow. What differentiates these superstars from talented people in other professions, e.g. doctors, who are not able to earn extraordinary salaries compared to their coworkers and colleagues?

To answer this question we investigated a broad collection of theoretical studies on the subject. The authors main ideas and important concepts are summarised in table 1. For a detailed review and discussion of the various theories we refer to the seminar paper Christiansen and Sievertsen (2008) or to the original studies.

3 Empirical results

Considering football teams as factories producing »football«, each player can be regarded a part of the production process, and the available statistics make it possible to analyse the complete production process. Furthermore, it is possible to investigate how much each individual contributes to the production. An example of such an analysis is the study by Claudio Lucifora and Rob Simmons (2003), where the connection between goals and assists and the wage of football players is estimated. They find a significant superstar effect. Inspired by this paper we analysed the superstar effect in the Serie A using updated and more detailed data.

Data

The player wages presented in figure 1 are taken from *La Gazzetta dello Sport* and are gross of tax but exclude bonuses and commercially related income. Individual characteristics and performance statistics are collected from the German magazine *Kicker* and the Italian magazine *sports.it*. In order to avoid measurement errors, data has been crosschecked between the mentioned magazines, and with other sources, such as the Danish football website *Bold.dk* and the Italian football yearbook *Melegari* (2007).

Table 2 gives an overview of some selected variables. Odd and high values are often obtained by players who played very few minutes. For example, the maximum value of

Table 1. Review of theory.

<i>Author</i>	<i>Main ideas on the superstar phenomenon</i>
Smith (1776): <i>An Inquiry into the Nature and Causes of the Wealth of Nations</i>	According to Smith the superstar income was made up of two components, a »scarcity price« for the rarity and beauty of their talent and a compensation for the discredit they suffered.
Rosen (1981): <i>The Economics of Superstars</i>	Rosen developed the ideas of imperfect substitution and joint consumption technology to explain superstars income.
Adler (1985): <i>Stardom and Talent</i>	The superstar phenomenon in Adlers setting is simply a market device; a direct implication of the fact that consumers agree on certain superstars in order to minimise their learning costs. In this setting anybody can become a superstar, even persons with little talent. All that is required, is that they are able to capture a certain market share, so enough consumers already possess knowledge about them.
MacDonald (1988): <i>The Economics of Rising Stars</i>	Glenn M. MacDonald developed a stochastic dynamic superstar model to describe the superstar phenomenon. He used an information accumulation process to describe performance quality (i.e. talent).
Frank and Cook (1995): <i>The winner-take-all society</i>	Frank and Cook describe the concept of winner-take-all payoff structures in superstar professions, and claim that these structures attract too many contestants and thus are socially inefficient.
Borghans and Groot (1998): <i>Superstardom and Monopolistic Power: Why Media Stars Earn More Than Their Marginal Contribution to Welfare</i>	Lex Borghans and Loek Groot find that the main property that characterises superstar activities is that only winning counts. These activities will, if two conditions are met simultaneously, give rise to the possibility of superstars emerging. One, there must be differences in talent among the suppliers of the service. Two, the suppliers of the service somehow obtain a certain degree of monopolistic power in the activity in which they engage.

goals per game in season 2006/2007 is the player Mancosu – a midfielder from the club Cagliari Calcio s.p.a. – who only played 59 minutes in the season and scored one goal. This results in a goal per game ratio of 1.5.

It is evident from table 2 that the seven best earning players outperform the average player. This is expected and in itself it does not contradict standard economic theory. However, if the wage-performance relationship is nonlinear, in the sense that quadratic terms or dummies are needed to estimate the model, it contradicts standard theory and shows evidence of a superstar effect. Before we estimated the different models, the possible superstars had to be identified in order to specify the dummies.

Table 2. Data overview.

	Min	Max	Mean	Mean	Std. Dev.
	–	all	–	Top earners	all
<i>Individual Characteristics</i>					
Estimated yearly wage in mio. Euro	0.04	6.00	0.77	5.11	1.00
Year(s) to contract expire	1	5	2.91	3.43	1.30
Age	17	39	26.75	28.71	4.41
<i>Experience</i>					
Minutes played in the season 06/07	0	3,239	1,186	1,561	1,107
Minutes played in the season 05/06	0	3,330	1,080	2,303	1,145
Games for the national team	0	156	10.43	66.43	22.91
<i>Goals</i>					
Goals scored in season 06/07	0	26	1.63	7.86	3.28
Goals scored per game in season 06/07	0	1.53	0.09	0.29	0.18
Goals scored in season 05/06	0	23	1.55	12.71	3.31
Goals scored per game in season 05/06	0	0.98	0.08	0.51	0.15
Goals for national team	0	62	1.64	20.00	5.46
Goals per national team game	0	1.17	0.04	0.34	0.12
<i>Shots¹</i>					
Shots on goal in season 06/07	0	196	33.65	71.60	40.73
Shots on goal per game in season 06/07	0	5.87	1.98	2.80	1.73
Shots on goal in season 05/06	0	140	29.47	104.20	37.44
Shots on goal per game in season 05/06	0	6.38	1.64	4.36	1.72
<i>Assists</i>					
Assists in season 06/07	0	10	0.66	4.14	1.95
Assists per game in season 06/07	0	0.57	0.03	0.18	0.08
Assists in season 05/06	0	14	0.64	4.14	2.03
Assists per game in season 05/06	0	0.53	0.02	0.16	0.08
<i>Tackles²</i>					
Tackles in season 06/07	0	133	32.36	48.00	32.34
Tackles per game in season 06/07	0	6.32	1.63	2.22	1.33
Ratio of winning tackles in season 06/07	0	1.00	0.53	0.84	0.38
Tackles in season 05/06	0	126	26.53	63.50	29.41
Tackles per game in season 05/06	0	4.83	1.28	2.09	1.22
Ratio of winning tackles in season 05/06	0	1.00	0.47	0.78	0.41
<i>Passes</i>					
Passes in season 06/07	0	2,519	491	714	517
Passes per game in season 06/07	0	81.49	24.80	29.33	19.47
Ratio of completed passes in season 06/07	0	0.96	0.53	0.57	0.37
Passes in season 05/06	0	2,751	461	1062	539
Passes per game in season 05/06	0	89.64	22.32	40.54	21.04
Ratio of completed passes in season 05/06	0	0.94	0.43	0.72	0.36

Source: Own calculations on data from *La Gazzetta dello Sport*, *Kicker.de* and *sports.it*.

Notes: (1) Only strikers. (2) Only midfielders and defenders. Top earners refers to the 7 top earners, see table 4.

Table 3. Serie A superstars in the season 2007/2008.

Name	Club 07/08	Position	Yearly wage (mio. Euro)
Kaka	Milan	Mid	6.00
Totti	Roma	Str	5.46
Ibrahimovic	Inter	Str	5.00
Vieira	Inter	Mid	5.00
Pirlo	Milan	Mid	4.00
Seedorf	Inter	Mid	4.00
Jankulovski	Milan	Def	3.00
Figo	Inter	Mid	3.50
Mutu	Fiorentina	Str	1.50

Table 4. The seven best earning players in the season 2007/2008.

Name	Club 07/08	Position	Yearly wage (mio. Euro)
Kaka	Milan	Mid	6.00
Totti	Roma	Str	5.46
Ibrahimovic	Inter	Str	5.00
Vieira	Inter	Mid	5.00
Adriano	Inter	Str	5.00
Del Piero	Juventus	Str	4.80
Trezeguet	Juventus	Str	4.50

Source: La Gazzetta dello Sport.

Note: The seven best earning players served as a natural threshold since the following eight players all earned the exact same wage. In other words, either seven or fifteen players had to be chosen.

4 Superstars in our data

Position specific superstar criteria which involved several performance measures were used to identify the superstars in our dataset. This resulted in nine superstars who are presented in table 3. It should be noted, that some football players are superstars, not only because they perform well as football players, but also because they perform outstandingly as entertainers. Commentators often define such players as »crowd darlings«. However we were not able to find enough relevant information on this kind of performance.

5 Estimation results

Several models were estimated by simple OLS, including models with quadratic performance terms allowing for increasing/decreasing effects. We faced serious problems with club heterogeneity which is quite hard to observe. It was not possible to obtain panel data, so instead club specific variables were constructed to handle the heterogeneity problem.¹

Estimation results from the following three models are presented in table 5.

- Model (1) includes all performance measures for each position, but restricts the performance to have the same effect in the two previous seasons. None of the performance terms are quadratic.

1. For more details see the seminar paper Christiansen and Sievertsen (2008).

Table 5. Estimation results. OLS estimation, dependent variable: log. of yearly wage.

	Model (1)	Model (2)	Model (3)
<i>Individual Characteristics</i>			
Age	0.44* (0, 06)	0.45* (0.07)	0.48* (0.07)
Age Squared	-0.01* (< 0.01)	-0.01* (< 0.01)	-0.01* (< 0.01)
Years to contract expire	0.09* (0.02)	0.10* (0.03)	0.10* (0.03)
<i>Individual performance measures</i>			
Striker goals pr. season	0.67* (0.28)	0.67* (0.28)	0.76* (0.28)
Superstar	0.69* (0.20)	–	0.63* (0.21)
<i>International Experience</i>			
Italian national team	0.27* (0.08)	0.25* (0.08)	0.29* (0.08)
Other national team	0.47* (0.07)	0.49* (0.07)	0.50* (0.07)
<i>Team specific characteristics</i>			
Juventus	0.78* (0.20)	0.73* (0.20)	–
Observations used	444	444	444
Number of explanatory variables:	30	29	29
R ²	0.73	0.72	0.72

Note: Standard errors in parenthesis. * denotes significance at the 5 percent level.

- Model (2) is the same as model (1) but does not include a dummy for being a superstar.
- Model (3) is similar to model (1) apart from the fact, that the dummy for the club being F.C. Juventus Turin is excluded.²

The estimates are generally much as expected. The age initially affects the players wage positively, but with a decreasing effect. Already around the age of 24 the age starts to affect the wage negatively. The remaining years until a contract expires also

2. The F.C. Juventus Turin dummy is included because the club was relegated to Serie B after season 2005/2006, not as a result of bad performance, but as result of a corruption decree. Juventus Turin was able to keep most of the players. Not including the dummy gives the picture, that all players underperformed in the 2006/2007 season.

influence the wage positively. This seems natural, since a player probably will request a higher wage for a longer commitment.

International experience also influences the wage determination positively. It is perhaps surprising that international experience for national teams other than the Italian team has a larger effect than Italian national team experience. This might be explained as a compensation for playing outside ones home country.

The results for all models estimated show that being a superstar has a clearly positive significant effect on the wage. Being a superstar increases the yearly wage by almost 70 percent. In comparison, the estimated effect of scoring one more goal in every game for an entire season is a 67 percent wage increase.

We estimated several models with various functional forms of performance (quadratic terms etc.), where most models showed a decreasing effect of performance. The superstar bonus is therefore probably obtained by players who are good in many aspects, and not just in one single category.

6 Conclusion

Using simple tools, we find clear evidence of a superstar effect in Italian football. This finding is in line with most studies on this subject. However, a quite new study by Lehmann and Schulze (2007) on data from the Bundesliga does not find evidence of a superstar effect in German football. This might be due to a different estimation method. Therefore further research on this subject is necessary. The amount and quality of data increase each year along with the econometric tools.

There is room for more thorough analysis of the phenomenon in order to ensure consensus.

Literature

- Adler, M. 1985. Stardom and Talent, *The American Economic Review*, 75(1), 208-12.
- Borghans, L., and L. Groot. 1998. Superstardom and Monopolistic Power: Why Media Stars Earn More Than Their Marginal Contribution to Welfare, *Journal of institutional and theoretical economics*, 154.
- Christiansen, N. A., and H. H. Sievertsen. 2008. Superstar Effect in Italian Football – *Seminar Paper*, University of Copenhagen.
- Frank, R. H., and P. J. Cook. 1995. The winner-take-all society.
- Lehmann, E. E., and G. G. Schulze. 2007. What does it take to be a star? – The role of performance and the media for German soccer players, *Discussion Paper Series 1*. University of Freiburg – Department of International Economic Policy.
- Lucifora, C. and R. Simmons. 2003. Superstar Effects in Sport: Evidence from Italian Soccer, *Journal of Sports Economic*, 35(4).
- MacDonald, G. M. 1988. The Economics of Rising Stars, *The American Economic Review*, 75(1), 155-66.
- Melegari, F. 2007. *Almanacco illustrato del calcio 2007*, vol. 66. Panini S.p.A.
- Rosen, S. 1981. The Economics of Superstars, *American Economic Review*, 71(6), 845-58.
- Smith, A. 1776. *An Inquiry into the Nature And Causes of the Wealth of Nations*. London: Methuen & Co., Ltd.