Universidad de Navarra

Facultad de Ciencias Económicas y Empresariales

Working Paper nº 01/13

Sport Talent, Media Value and Equal Prize Policies in Tennis

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Working Paper No.01/13
February 2013

ABSTRACT

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Abstract

Given the economic and commercial implications of sports, the media value of players and teams is considered a major asset in professional sports businesses. This paper aims to assess the economic value of intangible assets in the tennis industry. In order to rank the media value of professional tennis players (both men and women), we measure the intangible talent of players based on their exposure in the mass media. We use the ESI (Economics, Sports and Intangibles) methodology to examine some issues related to the competitive structure of tennis. Then, we explore whether policies regarding prize money could be more efficiently designed to account for the economic contribution of the players. The paper uses weekly data on the media presence and popularity of 1,400 professional tennis players (700 women and 700 men competing in 2007, respectively, in the WTA and ATP).

Key Words: Discrimination. Pay and performance. Professional tennis. Media value. Evaluation of intangible assets.

JEL-Code: J24, J33 y J71.

Acknowledgements

We would like to thank Javi Reguart, Pablo Hinojo, Jordi Fábrega and Jorge Álvarez-Campana for their valuable work as research assistants. At the stage of collecting data, we thank: Bruno Mateu, Bernd Frick, Shannon McSween, Aarthi Rajaraman, Peter von Allmen, Francois Rycx and Uwe Sunde. We have also benefited from comments made by Toni Mora and the participants in the: XIV Encuentro de Economía Aplicada, June 2011, Huelva (Spain), and the: VII GIJON Conference on Sports Economics, 4-5 May 2012, Gijón (Spain). Finally, we gratefully acknowledge financial support from the MEC: Ministerio de Educación y Ciencia (SEJ 2007-67295/ECON). All remaining errors lie within the authors.

1. Introduction and methodology

Given the economic and commercial implications of sports, the media value of players and teams is considered a major asset in professional sports businesses. In addition to sport talent, professional players possess other skills that the general public find attractive and are considered potential revenue sources. In so far as both sport and non-sport related skills are appreciated in the media, the task of evaluating the intangible talents of players can be performed by appraising their media value.

The notion of media value is thus used to designate the economic value that individuals and institutions achieve thanks to their recognition in the mass media. In professional sports, as well as in other entertainment industries (such as cinema, art, music, etc.), media value has become a major asset on the basis of which an increasing number of firms develop their businesses.

This paper aims to assess the economic value of intangible assets in the tennis industry. More specifically, it establishes procedures to measure the intangible talent of players based on their exposure in the mass media. In addition to ranking the media value of professional tennis players (both men and women), we examine some issues related to the competitive structure of tennis. Then, we explore whether policies regarding prize money could be more efficiently designed to account for the economic contribution of the players who produce spectacle in sporting events.

Building on the ESI (Economics, Sports and Intangibles) methodology, we have developed indexes to assess the economic value of talent, as captured by the degree of interest expressed by fans and the exposure achieved in the media. As mentioned previously, the ESI media value approach permits an evaluation of the players' personal talents and attractiveness beyond the contribution directly linked to sport performance.

The basic guidelines of the ESI methodology consist of analysing two complementary elements: popularity and notoriety. The ESI comprehensive index of media value is then computed by combining the popularity and notoriety indexes. Based on the individual appraisal of media value, it is also possible to develop measures of media value for teams, leagues, institutions, etc.

The popularity index captures the interest that a given player or team generates among people around the world. To measure the popularity of individuals or institutions, we analyse the share of attention that the protagonists draw from supporters and the general public (as captured by the Internet traffic: websites, specialised sites, blogs, home pages, etc.). Then, to obtain the popularity indexes of teams or leagues, we simply compute aggregate figures based on individual records.

Similarly, the notoriety index reflects the mass media exposure of individuals or teams. To evaluate the notoriety rank, we examine the number of news articles published, in the selected prominent languages, associated with each player in a given period of time. Therefore, the notoriety element reflects the mass media exposure of individuals that results from their sport performance or is attached to the social recognition of their personal characteristics.

The strength and broad scope of the ESI methodology derives from its capacity to provide homogeneous indicators of media value. These ratings can be applied to examine sport

disciplines, as well as other entertainment industries. The homogeneous and reliable nature of ESI rankings permits accurate comparisons between individuals and over time, based on comparable records on media value.

Depending on the type of analysis, the records are gathered on a monthly or weekly basis. To describe changes in the media's perceptions of a player over the course of a season, for instance, collecting records twice a week may be appropriate. Instead, if the aim is to calculate annual rankings, the meaningful procedure consists of computing the average for the entire year. The ESI methodology has been successfully applied in recent years and has permitted evaluations of the media values of professional sport competitions within the context of football (European domestic leagues, UEFA Champions League, the World Cup, etc.), basketball (NBA, ACB and Basketball World Cup), and Formula 1. ESI data sets also include other fields, such as golf, cycling, and baseball.

In addition to providing information on the levels of media value and popularity of prominent tennis players, our analysis permits us to address questions within the fields of labour and industrial economics. Consider, for instance, the relationship between productivity (both sport performance and media value) and earnings in tennis or the competitive structures of the main tournaments.

Once the main aspects of the ESI methodology have been described, the following pages address various aspects related to media value in professional tennis. The most relevant issue that we examine here is perhaps the extent to which policies regarding prize money could be more efficiently implemented. From an economic point of view, the structure and organisation of sport industries should be arranged to reward the agents involved in entertainment provision in keeping with their economic contributions.

2. Related literature

Nowadays, an increasing number of economic activities are based on the exploitation of intangible assets. Thus, there is an urgent need to devise tools for evaluating intangibles, especially in businesses where assets of this kind are the most valuable revenue source (Hall, 1992). Some papers highlight the complexity of this endeavour, due to the nature of the assets to be evaluated (see for instance Lev, 2006). To address this issue, we adopt an innovative methodology, the description of which is one of the relevant contributions of these pages.

First, note that the tennis industry is a peculiar market within the entertainment business. Considering the large size of the professional sports industry, it must be understood as one of the most significant entertainment providers. As a business, the tennis industry builds on the talent of its players, whose performances generate sport success and awards. Therefore, measuring sport talent (largely intangible) is critical to explore the potential sources of revenues.

Second, the professional tennis market has been drastically transformed recently through technological progress. Due to the development of mass media, large numbers of new "consumers of leisure" have gained access to the tennis (media) industry. As a result, a tremendous increase in the size of the market (and consequently, in the amount of revenues) has taken place.

Attempts at approximating the value of the players' economic contribution have generally been restricted to their sport performance, as for instance in the works by Scully (1974) or Berri (1999).[1] However, given that the actual contribution of players is also related to their skills as media leaders, we must go beyond mere sports achievements to obtain a complete picture of the matter. In other words, most studies conducted thus far have not managed to accurately evaluate the overall contribution of players, as they neglect essential aspects of the business linked to mass media power.

Besides, there are other aspects of the sports industry that should be considered. As mentioned previously, due to the economic implications of modern sports, the media value of players is a key asset for organising professional sports as a business. On the one hand, this type of industry is characterised by the typical contest system, which draws attention from the fans through the uncertainty attached to the unpredictable outcomes of matches (see Szymanski, 2001 and 2003).

On the other hand, the tennis industry is a winner-take-all market. According to the winner-take-all hypothesis, proposed by Frank and Cook (1995), workers who are slightly better than others become winners in the market and receive much higher earnings than the losers (the wages of the former group exhibit a more than proportional size with respect to its productivity). Typically, in this type of industries, a limited number of leaders achieve "superstar" status, thereby attracting extra high earnings.

In the economics literature, Noll (1974) and Rosen (1981) have already referred to the phenomenon of superstars. More recently, Dobson and Goddard (2001) stressed again that skewed earnings distributions might stem from the scarce supply of outstanding talent, along with the large audiences they attract. Thus, a reduced number of people dominate the activities they engage in and earn enormous rewards. Frank and Cook (1995) remark that these markets (professional sports, pop culture, arts, etc.) exhibit similar reward structures, in which many individuals compete for a few large prizes at the top. As pointed out by Garcia-del-Barrio and Pujol (2007 and 2009), the winner-take-all element is at work in several sports industries.

Moving into a different area, we must be aware that sports are also present in the field of brand development and sponsorship. The reputation of a brand is typically constructed on the basis of strategic intangible assets that, in the context of sports, essentially consist of player talent and sport achievements. Brand development is also closely linked to merchandising, broadcasting rights, and other commercial sources of revenues.[2]

3. Data description and media value rankings

In this study, we use weekly data on the number of news articles and the cumulative Internet exposure of the top 1,400 professional tennis players: 700 women from the WTA and 700 men from the ATP in 2007. (ATP denotes the Association of Tennis Professionals,

[1] Among the papers that have clarified the framework for analysing the sports industry, it is worth mentioning the contributions by Rotenberg (1956); Neale (1964) and Sloane (1971). These studies also provide pertinent lessons on good entrepreneurial practise.

[2] The economic exploitation of brands in sports has been analysed for the case of Manchester United (Szymanski, 1998) and Real Madrid (Blanco and Forcadell, 2006).

formed in 1972; WTA is the Women's Tennis Association, founded one year later). The data come from different sources: the data on media value are calculated by the authors, while the information on the other variables, such as money prizes, tournaments, etc., was obtained from the official web pages of the ATP (http://www.atptennis.com) and the WTA (http://www.sonyericssonwtatour.com).

Table 3.1 reports the media value rankings of the top male tennis players in 2007. The magnitude of this index indicates the multiple by which an individual player multiplies the media value level of the normal (average) individual in our sample.

Table 3.1. Ranking of Media Value of Professional Tennis Players (Men)

Rank	Player	Country	ESI index of Media Value	Points ATP 2007
1	Roger Federer	SUI	**43.5**	7,205
2	Rafael Nadal	ESP	**36.9**	5,385
3	Andy Roddick	USA	**21.3**	2,430
4	Novak Djokovic	SRB	**19.9**	4,470
5	Nikolay Davydenko	RUS	**15.3**	3,250
6	James Blake	USA	**12.4**	2,110
7	Lleyton Hewitt	AUS	**11.5**	1,365
8	Carlos Moya	ESP	**10.8**	1,620
9	Fernando Gonzalez	CHI	**10.6**	1,905
10	David Ferrer	ESP	**10.2**	2,130
11	Richard Gasquet	FRA	**10.2**	1,680
12	Andy Murray	GRB	**10.0**	1,705
13	Tommy Robredo	ESP	**9.9**	1,965
14	Tomas Berdych	CZE	**8.8**	1,735
15	Guillermo Canas	ARG	**8.7**	1,678
16	Marat Safin	RUS	**8.6**	735
17	Andre Agassi	USA	**8.6**	-
18	Tommy Haas	GER	**8.2**	1,870
19	David Nalbandian	ARG	**7.7**	1,375
20	JuanCarlos Ferrero	ESP	**7.7**	1,335

SOURCES: ESI own calculations and ATP (http://www.atptennis.com)

First, we identify Federer and Nadal as the undisputed leaders of tennis media value in 2007. This conclusion refers to the men's rankings but also applies to the comprehensive mixed ranking with all 1,400 players (reported in Table 3.3 and computed using records of all players either in the ATP or WTA tour). According to our estimations, Federer received (on average throughout the year 2007) a degree of attention 43.5 times larger than the interest achieved by the average tennis player in the sample, which in this case consists of 700 players. Similarly, Rafael Nadal receives 37 points in the ESI ranking, meaning that he enjoys a level of media value 37 times greater than the average player.

Similarly, Table 3.2 presents the results for the top 700 women players. Justine Henin is the leader among women, while Maria Sharapova (6^{th} in the combined ranking of Table 3.3) holds the 2^{nd} position, receiving a share of attention that clearly exceeds the predicted level that one should expect if relying exclusively on sport performance. This particular feature will be examined and further explained in sections 4 and 5.

Table 3.2. Ranking of Media Value of Professional Tennis Players (Women)

Rank	Player	Country	ESI index of MediaValue	Points WTA 2007
1	JUSTINE HENIN	BEL	**41.1**	5,930
2	MARIA SHARAPOVA	RUS	**33.3**	2,861
3	SERENA WILLIAMS	USA	**32.2**	2,767
4	VENUS WILLIAMS	USA	**31.4**	2,470
5	JELENA JANKOVIC	SRB	**25.5**	3,475
6	SVETLANA KUZNETSOVA	RUS	**24.1**	3,750
7	AMELIE MAURESMO	FRA	**21.7**	1,906
8	ANA IVANOVIC	SRB	**20.7**	3,175
9	MARTINA HINGIS	SUI	**16.9**	1,502
10	MARION BARTOLI	FRA	**14.1**	2,096
11	PATTY SCHNYDER	SUI	**12.2**	1,704
12	ELENA DEMENTIEVA	RUS	**11.8**	2,022
13	ANNA CHAKVETADZE	RUS	**11.8**	2,625
14	ANNA KOURNIKOVA	RUS	**11.6**	-
15	DANIELA HANTUCHOVA	SVK	**10.5**	2,027
16	NADIA PETROVA	RUS	**10.0**	1,976
17	NICOLE VAIDISOVA	CZE	**9.9**	1,904
18	TATIANA GOLOVIN	FRA	**8.5**	1,882
19	MARY PIERCE	USA	**8.3**	-
20	DINARA SAFINA	RUS	**8.3**	1,820

SOURCES: ESI own calculations and WTA (http://www.sonyericssonwtatour.com)

One significant finding of this analysis is the large distance found – in terms of media value – between the few leaders in the rankings and the remaining players. In the ATP tour, a large gap separates the top 2 superstars (Federer and Nadal) from Andy Roddick, who is the third player in the ranking. A similar situation holds for the upper part of the women's WTA tour.

This feature suggests that the winner-take-all element is present in tennis. Moreover, as will soon be illustrated, it affects the monetary rewards as well as the distribution of media value concentration. That is precisely why, when conducting the empirical analysis, we include qualitative variables to account for "super star" players.

A cursory inspection of the tables also demonstrates the close correlation between media value and sport performance (captured by WTA or ATP points). This is corroborated by the usual statistical tools, as the correlation coefficient is 0.94, very high indeed.

Thus far we have computed separate rankings for men and women. This choice seems to be imposed by the structure of tennis competition itself, as the tournaments are typically organised by grouping men and women separately. The same can be said of the rating systems: the WTA and ATP rankings. At this point, it must be noted that among the advantages of the ESI approach is precisely the homogeneous character of its rankings, which permits conducting a joint analysis of men and women.

The joint mixed index (for the full sample) is then computed by including both the 700 men and 700 women. In line with this new arrangement, the ESI index is now expressed with respect to the average value of the representative player in the data set of 1,400

players. Table 3.3 presents the results of this exercise, which enable us to fairly compare the index for all the players, either men or women.

Table 3.3. Joint Ranking of Media Value in Professional Tennis (Both men and women)

	Player	ATP/WTA Rank		ESI index of Media Value	Prize Money *	GSlam 2007	Masters 2007
1	Federer, Roger	ATP (1)	SUI	**54.3**	7,405,620	3	2
2	Nadal, Rafael	ATP (2)	ESP	**48.4**	4,395,185	1	3
3	HENIN, JUSTINE	WTA (1)	BEL	**28.4**	4,367,086	2	2
4	Roddick, Andy	ATP (5)	USA	**25.6**	1,232,070	0	0
5	Djokovic, Novak	ATP (3)	SRB	**24.2**	3,313,700	0	2
6	SHARAPOVA, MARIA	WTA (5)	RUS	**22.9**	1,258,550	0	1
7	WILLIAMS, SERENA	WTA (6)	USA	**22.4**	2,066,641	1	1
8	WILLIAMS, VENUS	WTA (8)	USA	**21.6**	1,843,187	1	0
9	Davydenko, Nikolay	ATP (4)	RUS	**19.0**	1,576,775	0	0
10	JANKOVIC, JELENA	WTA (3)	SRB	**17.9**	1,685,387	0	2
11	KUZNETSOVA, SVETLANA	WTA (2)	RUS	**16.9**	1,962,487	0	0
12	Blake, James	ATP (7)	USA	**15.9**	941,585	0	0
13	MAURESMO, AMELIE	WTA (13)	FRA	**14.8**	580,104	0	0
14	Hewitt, Lleyton	ATP (23)	AUS	**14.7**	662,075	0	0
15	Moya, Carlos	ATP (16)	ESP	**14.5**	853,315	0	0
16	IVANOVIC, ANA	WTA (4)	SRB	**14.3**	1,660,354	0	1
17	Gonzalez, Fernando	ATP (9)	CHI	**14.3**	1,219,330	0	0
18	Murray, Andy	ATP (12)	GBR	**13.0**	830,155	0	0
19	Ferrer, David	ATP (6)	ESP	**13.0**	1,206,252	0	0
20	Robredo, Tommy	ATP (8)	ESP	**12.6**	928,147	0	0

SOURCES: ATP (http://www.atptennis.com); WTA (http://www.sonyericssonwtatour.com) and ESI own calculations. * Price Money in $US.

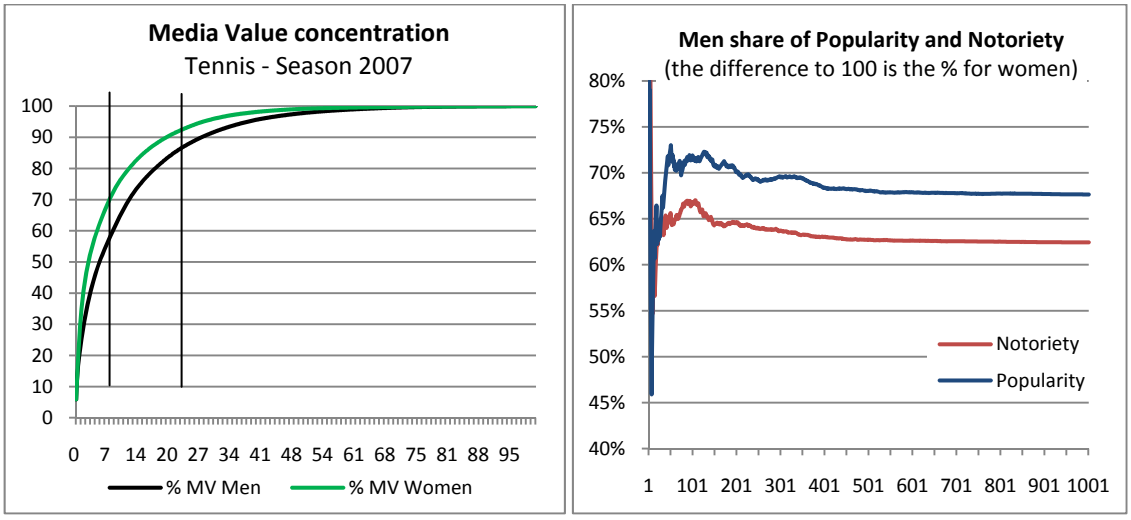
First, note that five women are found in the group of the top 10 most popular tennis players in the world. Notice further that Henin's prominence in 2007 (she has more than twice the points of Sharapova in the WTA ranking) does not correspond to an equivalent proportion with respect to their relative positions in terms of media value. It is also noteworthy that Hewitt (23rd in the ATP) displays a greater level of media value than Anna Ivanovic, despite her being the 4th player in the WTA ranking. The reasons behind these outcomes are discussed in Section 5.

Second, we found evidence again of the winner-take-all effect, which may help to explain the high degree of media value concentration in tennis. This phenomenon especially affects individuals situated in the upper tier of the distribution, an assertion that can be inferred from the substantial distance that separates the leaders in the rankings and their direct rivals. The economic and media status of Nadal or Federer is far beyond the levels of other tennis players. Additionally, a similar feature applies, albeit to a decreasing extent, all along the media value distribution function.

Moreover, as the following sections demonstrate, the winner-take-all structure affects the media value distribution as well as the distribution of tennis players' earnings. That is to say, the media value of tennis players – and hence the total money prizes – grows more than proportionally compared to sport performance or productivity.

Our analysis also reveals that most of the attention in the mass media is absorbed by a limited number of super stars. Some information may help to illustrate this point: the top 20 players (out of 1,400) generate 30% of the total media value in tennis, even if the degree of concentration differs in the WTA and ATP tours. The left diagram of Figure 3.1 summarises the analysis by dividing the sample into two groups by sex.

Figure 3.1. Concentration and share of Media Value by sex - Tennis 2007



The group of the top 10 women accounts for more than 37% of the overall media value generated by female players, whereas the corresponding figure is approximately 27% for men. By examining the 70 most relevant women and the top 70 men (the top 10% of each group), we conclude that they are responsible for 77 and 67%, respectively, of the overall media value in tennis. Similarly, to account for nearly all of the media attention generated by the tennis industry, one only needs to consider 25% of the players, as they represent more than 90% of the media value of tennis.

Another important matter seems to be the different structures in the level and share of media value in tennis exhibited by men and women. The right side diagram in Figure 3.1 conveys information that is useful in two respects. First, it enriches the approach by distinguishing between the two elements that define media value: the notoriety and popularity indexes. Second, it presents a full account of the percentage of notoriety and popularity that correspond to men or women at every stage of the cumulative distribution (starting from the player with the highest rating and moving down to the player in position 1,000).

One conclusion of this analysis is that both notoriety and popularity exhibit a similar evolution, with respect to the percentage shares corresponding to men and women. However, the most interesting feature disclosed here is that ATP players attract a much higher level of interest than women (from fans and the public) in the mass media. The share of popularity produced by male players is above 70% for top players and tends to stabilise at approximately 68% when more than 200 players are considered (implying that women are responsible for only 32% of the overall popularity of tennis). Similarly, the share of notoriety attached to men ranges from between 67% for small samples and 62.5% if considering more than 200 players. This point motivates the empirical analysis in Section 5 and is considered perhaps the main contribution of the present study.

4. Sources of media value in tennis

It has already been stressed that, in markets such as the tennis industry, the media value of players is a major revenue source. Some individuals are endowed with outstanding performance skills (exclusive factors that are considered irreplaceable), which allow these individuals to accrue large economic revenues.

This section examines the sources of media value in tennis, focussing on the extent to which sport performance enriches the media value status of players. In line with the previous results, we find that the sport achievements of tennis players largely determine the sizes and changes in their media value figures.

Some reports produced by ESI revealed a strong statistical relationship between sport success and media value, a feature occurring for individual sports and for team sports.[3] The specific direction of the causal link (from sport performance to media value), although not easily verifiable through empirical analysis, is solidly based on theoretical arguments and common sense. Previous studies have recognised media value as a critical factor to predict potential revenues in sports industries.[4]

Before presenting the results of the regression analysis, Table 4.1 reports the summary statistics of the main variables. The empirical analysis in this section aims to identify the primary factors that are at the root of media value in tennis. Moreover, it explores whether there are significant differences between men and women in this regard.

For this purpose, and provided that the structures of the tournaments and the rating system is separated by sex, the regressions are run separately for the two subsample groups of men and women. Note also that, although the data set initially comprised 700 men and 700 women, missing values of some variables have forced the sample to be restricted to 680 and 698 players, respectively.

In the estimations we present hereafter, our baseline model adopts the "MediaValue" index as the dependent variable. However, bear in mind that the ESI media value ranking is constructed by combining the notoriety and popularity indexes, reflecting mass media exposure and the number of news articles associated with the players. Hence, we can always take the option of using either "Notoriety" or "Popularity" as other alternative dependent variables; this approach permits the exploration of aspects that would otherwise remain unknown. (The three alternative dependent variables must of course enter separately into the regressions).

As for the explanatory variables, current and past performances are the main factors to be examined.

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[3] For instance, Pujol *et al.* (2008) analyses the football industry and provides evidence that improved sport achievements imply higher media value levels. As reported by Pujol *et al.* (2010), the correlation is stronger for the case of individual disciplines, such as Formula 1.

[4] The media value of football players seems to be an accurate predictor of their potential capability to generate revenues. This feature is examined for the football industry by Pujol *et al.* (2008) and (2009). These studies report a strong empirical relationship between earnings and media value, to the extent that the latter variable explains nearly 90% of the variance in football clubs' revenues.

Table 4.1. Summary Statistics of the Main Variables

Women	Sample	Mean	Std. Dev.	Min	Max
MediaValue	698	1.03	3.53	0	40.9
Popularity	698	1.03	3.04	0	31.7
Notoriety	698	1.00	4.13	0	52.1
PointsWTA_2007	698	209.42	467.94	0	5930.0
PointsWTA_Past	698	167.93	384.54	0	3932.8
MoneyPrize_2007 *	698	90.82	267.96	0	4367.1
RankPosit_2007	698	603.10	346.01	1	1390.0
NoTourn_2007	698	10.98	7.87	3	34.0
NoTourn_Past	698	13.12	7.93	0	31.2
Men	**Sample**	**Mean**	**Std. Dev.**	**Min**	**Max**
MediaValue	680	1.01	2.92	0	42.7
Popularity	680	0.99	2.03	0	21.1
Notoriety	680	1.03	4.01	0	64.2
PointsATP_2007	680	247.95	509.59	1	7205.0
PointsATP_Past	680	206.23	404.55	3.4	5679.0
MoneyPrize_2007 *	680	125.19	400.07	0	7405.6
RankPosit_2007	680	397.76	296.18	1	1461.0
NoTourn_2007	680	13.57	5.87	1	28.0
NoTourn_Past	680	13.63	7.76	0.4	33.2

* Earnings expressed in thousands of $US.

Among the various ways to evaluate sport performance in tennis, we initially employed the total cumulative points accrued over the season by players in the WTA or ATP tours. These variables were denoted "PointsWTA_2007" or "PointsATP_2007", for 2007, and "PointsWTA_Past" or "PointsATP_Past" to account for the average (annual mean) of the points accrued between 2002 and 2006.[5] Although the estimations of this model were satisfying, we prefer reporting the results of an alternative approach that captures sport performance by calculating the sport achievement per tournament. The results were nonetheless essentially similar.

The chosen explanatory variable is thus defined as the ratio of the cumulative number of points (WTA or ATP) accrued in the season over the number of tournaments played. The variables are denoted "PointPerT_2007", for year 2007 records, and "PointPerT_Past", for the average computed for the previous five seasons.

To complement the variables for sport performance, and due to the presumed winner-take-all element, dummy variables are also included in the regressions. They take a value of 1 for the winners in the market (tennis superstars) and 0 for the other players. We consider superstars to be the players who receive the highest levels of exposure in the

[5] This feature could be accurately captured either by the cumulative sport performance points (ATP for men and WTA for women) or the total "Prize Money" obtained throughout the season. This is because money prizes in tennis are strictly granted on the basis of sport achievements in the various tournaments; hence to capture the level of sport performance, one can in theory choose between these two alternative proxy variables. Ultimately, in the regressions in this section, we preferred the number of points accumulated in the ATP or WTA tours (and these expressed in relative terms per tournament). However, had we employed "Money Prizes", instead of using ATP points, the same essential results would have been achieved.

media, as measured by the "MediaValue" index. The names of these qualitative variables are "WinT-All_mv2", for the 2 men or women with largest media values; and "WinT-All_mv4" for the 2 second-best players (the 3rd and 4th superstars of WTA or ATP tour). We have run the regressions using two variables of this type, although the number of superstars is of course a matter of choice.[6]

The set of explanatory variables also includes the number of tournaments played in the 2007 season: "NoTourn_2007" and the average number of competitions in which the players have participated in the previous five tennis seasons: "NoTourn_Past". These two variables are potentially relevant, as the more exposed a player is in the mass media, the greater attention he actually receives.

Finally, in addition to the main variables, one auxiliary variable is included to correct for some deficiencies in the measurement process of the dependent variable. As explained in the methodological introduction, the procedure for computing the notoriety levels of players consists of quantifying the number of news articles associated with them over the season. In doing so, we include articles in some of the most relevant languages: English, Spanish, French, German, Italian, Portuguese and Dutch. However, other important languages –such as Chinese or Russian– were ignored. As a consequence, measurement errors may be relevant, and this problem ought to be addressed to avoid bias and distorted results. Because no better way to address the matter was feasible, we include a qualitative dummy variable to control for players whose languages were neglected in the searching stage.

Other technicalities must be noted. First, to avoid heteroskedasticity problems, we have computed robust standard errors estimations. Second, to compare the weight of each explanatory variable relative to the others, elasticity ratios ("ey/ex", computed at the mean of the respective variable) are reported at the bottom of the tables.[7]

Table 4.2 gathers the estimation results of the regressions for men and women. The existence of four models (reported in 4 columns) is the result of estimating both regressions for the full sample (700 players) and for the top 300 players; a procedure that is suitable to cross check the validity of the results.

The similarity of the estimations made for the four models indicates that the results can be considered conclusive. Moreover, the R-squared values (0.9 or greater) are very high for cross-sectional analysis, indicating a strong explanatory power of the models.

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[6] However, grouping the superstar players in pairs is not casual, as the structures of tennis contests typically entail rivalries in which the two protagonists share the level of interest generated by the game in a similar fashion. This is particularly the case at the top, for the players who reach the finals, but also applies to earlier stages of the tournaments.

[7] Elasticity is a ratio expressing the percentage change in one variable with respect to the percentage change in another variable. Applied economists often resort to elasticity, as it is independent of units and permits direct comparisons. However, because elasticity is evaluated at a point, its interpretation is valid only for small (infinitesimal) changes in the variable. The STATA manual explains that social scientists would informally explain the meaning of ey/ex () = 1 as "y increases 100% when x increases 100%" or as "y doubles when x doubles", although neither statement is literally true. Instead, for the statement to be accurate, it must incorporate an additional assumption (highlighted in italics): ey/ex () = 1 means that "y increases with x at a rate such that, *if the rate were constant*, y would double if x doubled".

Table 4.2. Estimation results of the "MediaValue" model

	Media Value WOMEN			Media Value WOMEN 300			Media Value MEN			Media Value MEN 300		
	Coeff.		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**
WinT-All_mv2	14.9854	***	(6.80)	14.1969	***	(5.73)	5.0586		(1.22)	4.2385		(0.95)
WinT-All_mv4	8.2017	**	(2.05)	7.4746	*	(1.70)	5.4428	***	(3.27)	5.1167	***	(2.94)
PointPerT_2007	0.0223	***	(7.20)	0.0238	***	(7.09)	0.0661	***	(8.08)	0.0685	***	(7.44)
PointPerT_Past	0.0696	***	(6.47)	0.0719	***	(5.66)	0.0490	***	(6.56)	0.0491	***	(5.90)
NoTourn_2007	0.0262	***	(3.70)	0.0482	***	(3.73)	0.0006		(0.08)	0.0273		(1.59)
NoTourn_Past	-0.0038		(-0.58)	0.0157		(1.18)	-0.0191	***	(-2.97)	-0.0056		(-0.58)
No_language	-0.2527	***	(-3.25)	-0.4557	***	(-2.85)	-0.2875	***	(-4.36)	-0.4063	***	(-3.09)
Constant	-0.4685	***	(-4.96)	-1.1567	***	(-3.90)	-0.1843	*	(-1.77)	-0.9597	***	(-2.85)
Number obs.	696			300			680			300		
R-squared	**0.8987**			**0.9151**			**0.9190**			**0.9301**		
	ey/ex	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**
WinT-All_mv2	0.0417		0.003	0.0423		0.006	0.0147		0.003	0.0137		0.006
WinT-All_mv4	0.0228		0.003	0.0223		0.006	0.0159		0.003	0.0166		0.006
PointPerT_2007	0.5714		26.465	0.5622		52.960	0.9605		14.662	0.8877		26.654
PointPerT_Past	0.7044		10.444	0.5964		18.567	0.5287		10.880	0.4333		18.158
NoTourn_2007	0.2787		11.004	0.2814		13.090	0.0077		13.573	0.2205		16.603
NoTourn_Past	-0.0480		13.159	0.1171		16.692	-0.2582		13.630	-0.0503		18.344
No_language	-0.1174		0.479	-0.1051		0.516	-0.0867		0.304	-0.0547		0.276

Statistical significance: *** p-value < 0.01; ** p-value < 0.05; ** p-value < 0.1; (t-statistic) in parenthesis.

There is no question that – among all the explanatory variables – the most important factor is sport achievement, both at the present time and in the past. This conclusion is evident from the observation of the sign and significance of the estimated coefficients (as reported by the t-*statistics*). It is also corroborated by comparing elasticity ratios.

As we had already accounted for sport performance, we expect the two variables accounting for the number of tournaments to be positively correlated with media value status. This is the case regarding the year 2007, as "NoTourn_2007" shows a positive coefficient that is statistically significant for women. However, for "NoTourn_Past" (annual average of tournaments in the last five years), the relationship is statistically insignificant, and (implausibly) negative in the case of men.[8]

Regarding the qualitative variables for superstar players, the expected outcomes hold for the women's model and to some extent in the case of men. The estimated coefficients are consistently positive and generally significant (except for the two ATP leaders), providing support for the winner-take-all hypothesis.

The results in Table 4.2 contain similar outcomes regardless of sex. Accordingly, one may argue that the empirical analysis conveys essentially identical conclusions in all regards

[8] This unexpected result could be due to a correlation between the quality of the players and the number of tournaments played. It is reasonable to imagine that poor performing players attempt to compensate for their weak media value exposure by participating more often in tournaments than high-quality players do.

for WTA and ATP players. Moreover, the results undergo no substantial changes when the regressions are performed for the group of the top 300 men or top 300 women, rather than using the full sample of 700 individuals.

The estimation of our basic model, with "MediaValue" as the dependent variable, will now be replicated to deliver the "Notoriety" and "Popularity" models. This analysis is performed by separately employing the two components of the initial dependent variable. This further refinement of the analysis leads to a better understanding of the behaviour of media value in the short and long run (which is what we refer to when speaking of notoriety and popularity, respectively).

The estimation results of these models are presented in Table 4.3 and Table 4.4 and yield interesting findings. On the one hand, these new results corroborate the previous ones, thereby leading us to more resolutely support the conclusions previously mentioned. On the other hand, the regression analyses performed with the "Notoriety" and "Popularity" models provide additional implications, as we examine in greater detail below.

Table 4.3. Estimation results of the "Notoriety" model

	Notoriety WOMEN			**Notoriety WOMEN 300**			**Notoriety MEN**			**Notoriety MEN 300**		
	Coeff.		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**
WinT-All_mv2	21.4592	***	(3.89)	19.1700	***	(3.58)	14.5421	***	(3.63)	12.7149	***	(2.91)
WinT-All_mv4	13.2766	***	(2.80)	10.7876	**	(1.99)	9.4283	***	(4.67)	8.6837	***	(3.96)
PointPerT_2007	0.0308	***	(6.20)	0.0325	***	(6.02)	0.0944	***	(7.92)	0.1007	***	(7.78)
PointPerT_Past	0.0570	***	(4.47)	0.0668	***	(4.32)	0.0427	***	(4.31)	0.0412	***	(3.68)
NoTourn_2007	0.0427	***	(4.64)	0.0725	***	(4.36)	0.0043		(0.57)	0.0469	***	(2.58)
NoTourn_Past	-0.0114		(-1.52)	0.0125		(0.72)	-0.0306	***	(-4.57)	-0.0100		(-0.85)
No_language	-0.2751	***	(-2.81)	-0.4125	*	(-1.85)	-0.1295		(-1.45)	-0.2405		(-1.33)
Constant	-0.6927	***	(-4.80)	-1.8136	***	(-3.81)	-0.4875	***	(-4.64)	-1.8210	***	(-4.60)
Number obs.	696			300			680			300		
R-squared	**0.8621**			**0.8734**			**0.9399**			**0.9473**		
	ey/ex	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**
WinT-All_mv2	0.0613		0.003	0.0557		0.006	0.0414		0.003	0.0371		0.006
WinT-All_mv4	0.0379		0.003	0.0313		0.006	0.0268		0.003	0.0254		0.006
PointPerT_2007	0.8113		26.465	0.7509		52.960	1.3397		14.662	1.1759		26.654
PointPerT_Past	0.5917		10.444	0.5410		18.567	0.4501		10.880	0.3278		18.158
NoTourn_2007	0.4667		11.004	0.4138		13.090	0.0563		13.573	0.3409		16.603
NoTourn_Past	-0.1494		13.159	0.0907		16.692	-0.4043		13.630	-0.0800		18.344
No_language	-0.1312		0.479	-0.0929		0.516	-0.0382		0.304	-0.0292		0.276

Statistical significance: *** p-value < 0.01; ** p-value < 0.05; ** p-value < 0.1; (t-statistic) in parenthesis.

First, note that current performance is more relevant than past performance in explaining the media value rank in the short run (the "Notoriety" dependent variable). This conclusion is the expected outcome and is deduced through two findings: (i) the statistical significance of the estimated coefficient of "PointPerT_2007" compared to that of "PointPerT_Past" (the former is higher than the latter); and (ii) the relative magnitudes of the elasticities reported at the bottom of Table 4.3. (The elasticities of present performance and past performance are: 0.8113 compared to 0.5917 for the model of women and 1.3397 compared to 0.4501 for men).

Table 4.4. Estimation results of the "Popularity" model

	Popularity WOMEN			Popularity WOMEN 300			Popularity MEN			Popularity MEN 300		
	Coeff.		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**
WinT-All_mv2	9.5689	**	(2.52)	9.2238	**	(2.24)	-4.4251		(-0.89)	-4.2380		(-0.81)
WinT-All_mv4	4.5479		(1.36)	4.1615		(1.13)	1.4574		(0.95)	1.5498		(1.01)
PointPerT_2007	0.0146	***	(9.36)	0.0150	***	(8.65)	0.0378	***	(5.62)	0.0362	***	(4.51)
PointPerT_Past	0.0761	***	(7.88)	0.0770	***	(6.71)	0.0554	***	(8.44)	0.0569	***	(8.12)
NoTourn_2007	0.0138	**	(2.20)	0.0238	**	(2.07)	-0.0031		(-0.37)	0.0077		(0.39)
NoTourn_Past	0.0057		(0.88)	0.0190		(1.55)	-0.0076		(-0.96)	-0.0013		(-0.12)
No_language	-0.2532	***	(-3.67)	-0.4989	***	(-3.39)	-0.4455	***	(-6.99)	-0.5721	***	(-4.73)
Constant	-0.2999	***	(-4.64)	-0.4999	**	(-2.57)	0.1189		(0.89)	-0.0985		(-0.26)
Number obs.	696			300			680			300		
R-squared	**0.902**			**0.9115**			**0.7694**			**0.8042**		
	ey/ex	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**
WinT-All_mv2	0.0268		0.003	0.0281		0.006	-0.0132		0.003	-0.0154		0.006
WinT-All_mv4	0.0127		0.003	0.0127		0.006	0.0043		0.003	0.0056		0.006
PointPerT_2007	0.3761		26.465	0.3641		52.960	0.5629		14.662	0.5281		26.654
PointPerT_Past	0.7744		10.445	0.6545		18.567	0.6112		10.880	0.5650		18.158
NoTourn_2007	0.1474		11.004	0.1425		13.090	-0.0433		13.573	0.0703		16.603
NoTourn_Past	0.0730		13.159	0.1448		16.692	-0.1050		13.630	-0.0132		18.344
No_language	-0.1183		0.479	-0.1180		0.516	-0.1376		0.304	-0.0865		0.276

Statistical significance: *** p-value < 0.01; ** p-value < 0.05; ** p-value < 0.1; (t-statistic) in parenthesis.

Conversely, with respect to the long lasting recognition of players ("Popularity"), past performance is found to be the most relevant explanatory variable. (The respective elasticity, in Table 4.4, is now 0.3761 compared to 0.7744 for women and 0.5629 compared to 0.6112 for men). Again, the outcome is not surprising, given that popularity can only be accumulated over time.

Second, according to the estimated results, it seems that the "Notoriety" regressions work better in the case of men; whereas the opposite applies to the sample of women, where the explanatory power of the model is higher when we use "Popularity" as the dependent variable. This can be seen by comparing the respective significance levels and R-squared coefficients. In summary, the estimation results are satisfying and indicate that media value in tennis primarily depends on current and past sport performance.

To briefly describe the conclusions reached so far, we can enumerate the factors that are identified as the most relevant to explain the origin of media value:

1. Current sport performance, as captured by the number of ATP or WTA points obtained in the present year.
2. Past sport achievements, approximated by the five-years annual average of the number of points accumulated in the ATP or WTA tour.
3. The number of tournaments in which the player has participated in the current season. (Apparently, the number of past tournaments is less relevant, especially in the case of the ATP tour).

4. The winner-take-all element, involving top superstar players. This is relevant for both men and women, but still requires a more detailed examination.
5. Other personal characteristics that refer to non sport-related factors, especially those that the public and the mass media find attractive.

We consider that having been able to approximate, in a statistical way, the relative importance of each of these five features mentioned above is an important contribution of this study. Additionally, in the case of certain individuals, the special skills mentioned in the fifth point are a major source of media value, which allow them to attract substantial additional revenues. Given the relevance of the issue, we devote a complete section to analyse this point.

5. Sport talent and media value premium

The previous section has developed an empirical model for studying the origin and sources of media value. The specifications of the models in Section 4 are based on the notion that media value (of tennis players) is largely determined by sport achievements.

Nonetheless, a number of non-sport related factors – such as the nationality or personal characteristics of the players – significantly affect their media value status. This is clear from the awareness that R-squared is never equal to 1, meaning that several aspects fall beyond the explanatory capacity of the variables linked to sport quality and performance.

Building on the baseline model in Section 4, this section investigates the size of the personal aspects that are not captured by the indicators of the sport contributions of players. The task of defining these qualitative traits is somewhat difficult to achieve, but the ESI approach can help to approximate their magnitudes for a given level of sport performance. To this aim, we use the residuals of the models in Table 4.2 to identify the players who enjoy a media value level that exceeds their potential sport talent.[9]

Moreover, the residuals can be treated as a means of quantifying the players' ability to attract additional media value, in addition to the recognition that is directly related to their sport achievements.

First, it must be noted that residuals from the models estimated for men and women differ. To illustrate this point, the two diagrams in Figure 5.1 plot actual media value against predicted media value. The latter is derived from the sport performance model, thereby indicating the expected media value that players would achieve strictly on the basis of sport performance records.

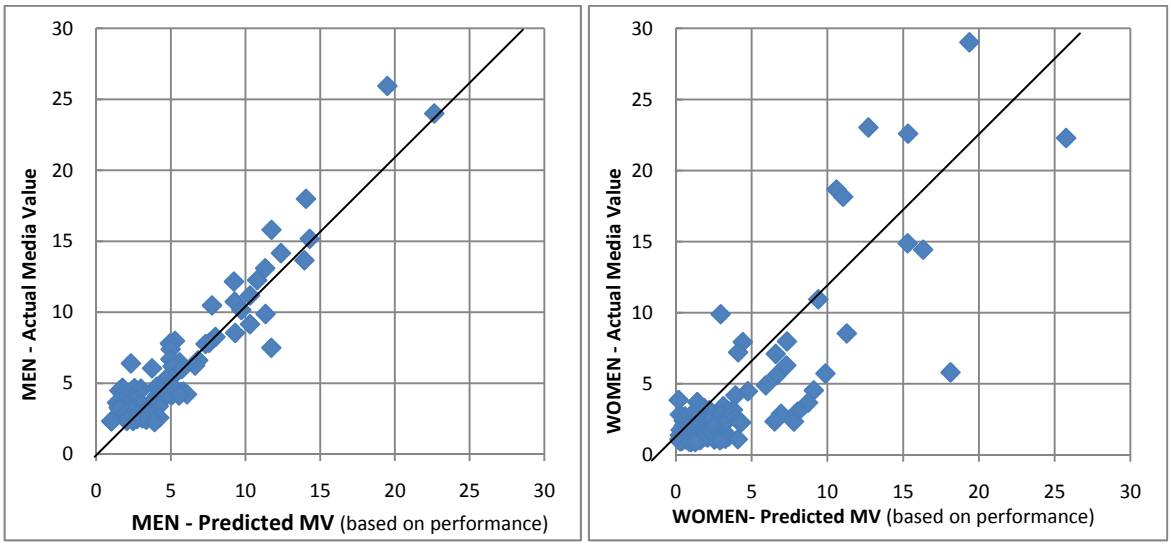
A cursory glance at the diagrams reveals that observations for women deviate, from the 45-degree line, to a greater extent than those of men. In other words, the absolute value

[9] To avoid spoiling the individual residuals of superstar players (Federer, Nadal, Henin, etc.) we use the residuals of the model in which the winner-take-all element is not considered; that is to say: "MediaValue" against "PointPerT_2007", "PointPerT_Past" and "No_language". We have performed robust standard errors estimations and run the regressions separately for men and women. In Figure 5.1 the observations for Federer and Nadal have been deleted to retain the same scale for the ATP and WTA tours, thus simplifying a comparison on the basis of a visual inspection of the graphs.

of the residuals (especially in the top part of the distribution) is generally larger for women than it is for male players. This is corroborated by a comparison of the R-squared values of the models: 0.919 for the men's and 0.8987 for the women's regression.

Furthermore, if we focus on the "Notoriety" model, the conclusion seems even more undisputable. Given the respective R-squared values (in this case: 0.94 for men and 0.862 for women) one may interpret, albeit not in an entirely conclusive manner, that approximately 14% of the variance in "Notoriety" among women tennis players cannot be explained on the basis of sport achievements; whereas the figure is just 6% in the case of men. This contrasting finding invites us to individually examine the case of the top players in both the WTA and ATP tours.

Figure 5.1. Deviations in the predicted outcomes of players' media values by sex



Having described the general behaviour of the residuals by sex, we now turn our attention to the top tennis players. The main outcomes, resulting from this detailed analysis, are displayed in Figure 5.2 and Figure 5.3 for men and women, respectively. A simple inspection of the figures reinforces the idea that dissimilar effects, in terms of notoriety and popularity, are operative for men and women; this feature is all the more evident when focusing on the super star tennis players (at the upper end of the media value distribution).

The residuals are represented in white if they take negative values and in black whenever they are positive. To make the interpretation of the graphics more intuitive, we have performed some limited calculations such that:

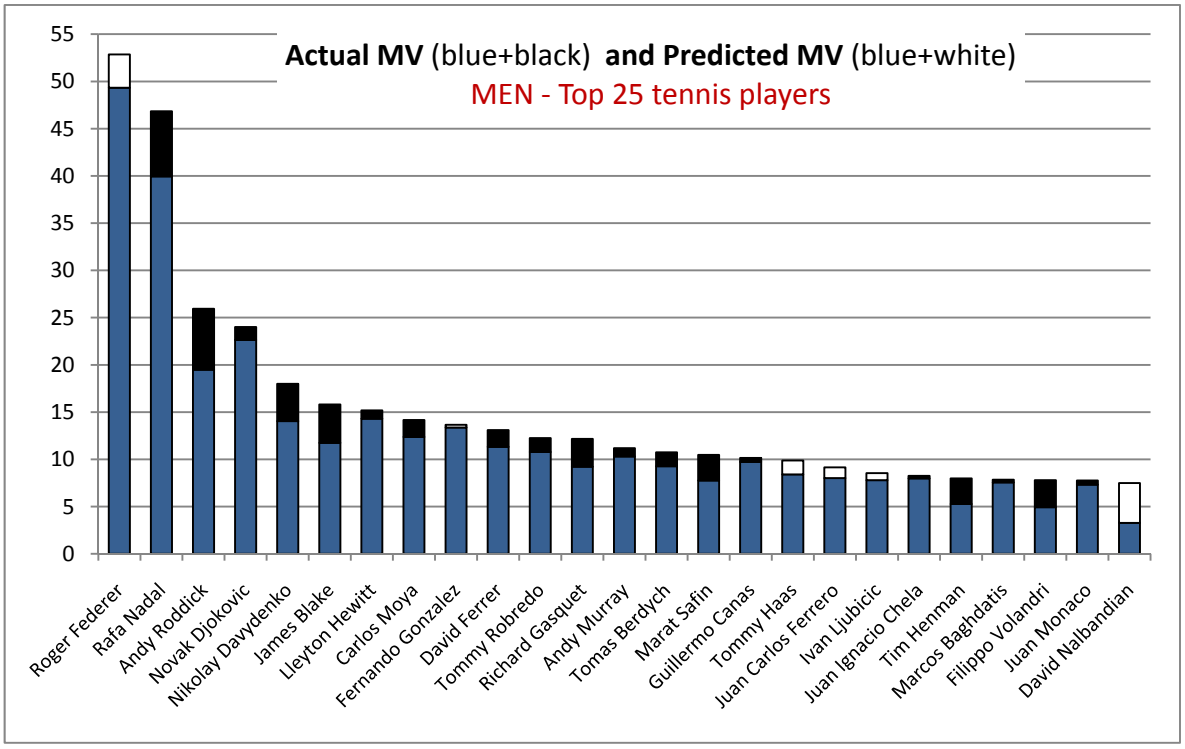
(i) The "actual Media Value" (as measured and calculated by the ESI methodology) is defined in the figures by the sum of the blue and black areas.

(ii) The "predicted Media Value" is represented by the union of the areas in blue and black. Bear in mind that the predicted (or expected) media values result from the estimations of the sport performance model, which was based on the sport performance variables referred to in Section 4.

Accordingly, the black area represents the extra amount of media value that is not directly linked to sport talent of players but could be due to personal skills and attractiveness to the media. Similarly, the white shadow captures the degree to which tennis players fall short of what they should have achieved according to their sport performance.

Hence, the interpretation of these figures reveals that some players actually enjoy greater media value status than what they deserve on the grounds of their athletic merits alone. This is the case for male players, such as Nadal, Roddick, and Blacke; but the effect is far more significant for women such as Sharapova, Venus and Serena Williams, Jankovic, Ivanovic, Hingins and, especially, Kournikova. Again, figures 5.2 and 5.3 illustrate – at the individual level – the extent to which some male and female players deviate from the normal pattern of the sport-based model in Table 4.2.

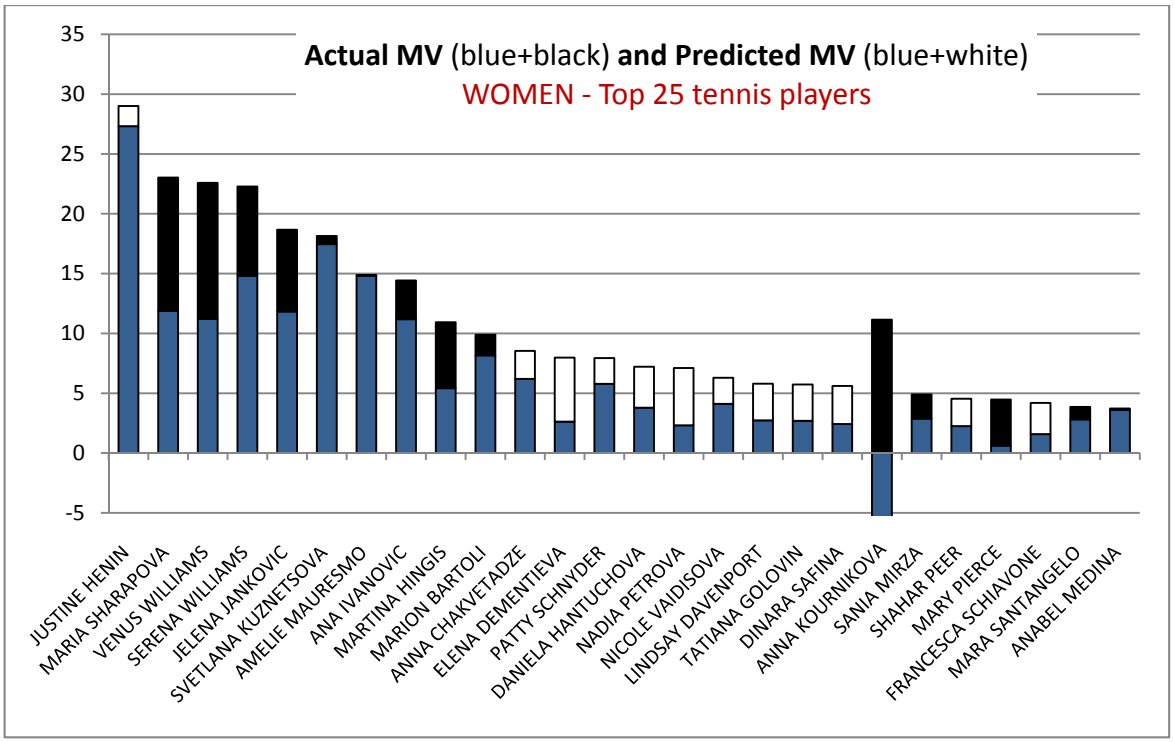
Figure 5.2. Actual and Predicted media value - Men tennis players



To summarise, consider the meaningful findings we have obtained by examining the deviations of current (or effective) media value from the predicted (or expected) media value; the latter being the estimated media value one should expect by exclusively considering to sport performance and achievements.

Notice further that the comparison of the two figures immediately provides support for the notion that the personal characteristics of players are more relevant for women than they are for men. This bias, even if statistically not very large, hints the existence of stereotypes that could be affecting the incorporation of women into particular labour markets.

Figure 5.3. Actual and Predicted media value - Women tennis players



6. Media value and "equal prize" policies

All four Grand Slam tournaments pay equal prize money to male and female tennis players. In 2007, the organisers of the Wimbledon Open decided to adopt this policy, just one year after the French Open began awarding the same prize money to the men's and women's singles champions. The other two (the US Open and Australian Open) already had followed this policy for years. The debate on the subject seems an endless argument that has become more notorious since the last Grand Slam implemented an equal prize policy.

The arguments in support of the current arrangement (of equal prize money in tennis) are varied. On one side, people invoke social reasons, the modern sensitivity towards historical discrimination against women and the desire to ensure that they occupy an equal role in society, a view that is becoming increasingly predominant. The following quote made in June 2012 by Stacey Allaster, the CEO of the women's tour, may be a good summary of this viewpoint: "Tennis, including the Grand Slams, is aligned with our modern, progressive society when it comes to the principle of equality. I cannot believe in this day and age that anyone can still think otherwise. This type of thinking is exactly why the WTA was founded and we will always fight for what is right." Of course, these may be good reasons for establishing equal prize policies in tennis tournaments.

Nevertheless, if the goal is to confront the issue from an economic perspective exclusively, we must then leave aside any argument that is not strictly of an economic nature. The aim of this study is respond to questions such as: to what extent are money prizes in tennis in accordance with the economic contributions of the players? Is there room for efficiency improvements in the tennis industry?

Thus, adopting an economic-centred approach leads to a different view and even to somewhat contradictory conclusions. In line with this, Gilles Simon, who in 2012 was elected to the ATP Player Council, has argued that men should be paid more than women at tennis tournaments. Two types of arguments support his position and may help to characterise people's opinions on the matter:

a) "men spend twice as long on court as women do at Grand Slams".

b) "[men] provide a more attractive show" in their matches.

It is true that, at the Grand Slam tournaments, men play best-of-five-set matches; whereas women play best-of-three matches. Moreover, even if in the majority of the other tournaments, all matches for both genders are best-of-three matches, the duration of the ATP games may still be generally longer than those of women. And yet, we believe that arguments of this kind are rather weak, as money prizes are nonetheless fixed in advance, without actually knowing the duration of the games. Moreover, from an economic perspective, the critical issue is determining the spectators' willingness to pay for a tennis match, regardless of its duration.

Ultimately, in keeping with economic rationality and to ensure that the events are organised with an efficient structure, attention must be focused on studying whether men's or women's tournaments arouse greater interest among the general public and examining to what extent.

The basic model developed thus far has proven to be reliable and provided us with a valid framework for responding this type of questions. Given the internal consistency of the previous specifications of the empirical model, we are in a position to address several topics in this industry. In particular, in this section we argue that the ESI methodology is an appropriate tool for addressing the issue of equal money prize rewards in tennis.

Economic theory recommends employing more intensively those inputs that are more productive. This general principle also applies in the sports industry, as shown, for instance, by Szymanski and Smith (1997) or Hoehn and Szymanski (1999).[10] The first purpose of this section is to examine whether this feature holds in the tennis industry and to establish the extent to which it applies.

We have found that media value level (of tennis players) is primarily accrued through sport success, although other factors are also involved. Additionally, tennis players generate economic added value (and hence revenues) through their media value status. Many companies are then happy to pay large amounts of money for the support, in their marketing and sponsorship campaigns, of the most popular superstar players. In summary, the media attention attracted by the individuals is an essential factor in determining their potential capacity for attracting earnings through various sources: prizes, merchandising, TV contracts, publicity, sponsorships, etc.

[10] A full discussion of the issue requires additional comments. In sports economics, players or clubs are typically considered to be profit maximising agents. However, following the earlier work of Sloane (1971), Késenne (1996, 2000) argued that, in the world of European soccer, clubs can be treated as win maximisers (subject to a profit constraint) rather than profit maximisers, leading to different conclusions about competitive restraints. Similarly, Garcia-del-Barrio and Szymanski (2009) find consistent evidence of win maximising (subject to a zero profit constraint) behaviour in both the Spanish and English leagues.

The issue under examination here is the degree of efficiency in the equal prize money policy now prevailing in the four major tennis tournaments. To determine whether this policy is supported by economic rationality, we estimate a model where the dependent variable is the money prize per tournament "PrizePerTourn_2007". Then, the main explanatory variable is the joint index of media value ("MediaValue_Mixed", as shown in Table 3.3, which is reported in more detail in the Data Appendix). Both variables are perfectly comparable for all tennis players, regardless of their sex, which is a critical strength of this empirical model.

But, in addition to implementing the most revealing empirical model (that is to say, the one described in the above paragraph), it is informative to examine the relationship between money prizes per tournament (the same dependent variable than before: "PrizePerTourn_2007") with respect to current sport productivity: "PointPerTourn_2007"; or to the 2 variables: "WTAperTourn" and "ATPperTourn", if the number of points in the WTA or ATP tour are allowed to have different slopes in the estimations. Table 6.1 reports the summary statistics of the available variables, including the winner-take-all dummies for the top 2 and top 4 superstar players.

Table 6.1. Summary Statistics of the Main Variables

	Sample	Mean	Std. Dev.	Min	Max
PrizePerTourn_2007*	1378	9.25	28.69	0	462.9
MoneyPrize_2007*	1378	107.78	339.94	0	7405.6
WinTakeAll_2	1378	0.00	0.05	0	1.0
WinTakeAll_4	1378	0.00	0.05	0	1.0
MediaValue_Mix	1378	1.01	3.16	0	52.9
Popularity_Mix	1378	1.00	2.40	0	28.1
Notoriety_Mix	1378	1.01	4.17	0	78.8
PointPerTourn_2007	1378	20.60	50.93	0	793.8
PointPerTourn_Past	1376	10.66	22.08	0.6	311.8
NoTourn_2007	1378	12.26	7.07	1	34.0
NoTourn_Past	1378	13.37	7.85	0	33.2
Women_Dummy	1378	0.51	0.50	0	1.0
No_language	1378	0.39	0.49	0	1.0

* Earnings expressed in thousands of $US.

Then, Table 6.2 presents the estimation results of the models relating the amount of money prizes per tournament with respect to the sport performance records of tennis players. The R-squared values are very high in all the models, which is not surprising given the existing rewards structure employed in both the ATP and WTA tours.

First, note that models in Table 6.2 are not perfectly legitimated, as men and women play in entirely separate competitions. Thus, a joint comparison in terms of sport performance is inadequate, insofar as half of the players in the sample have never played against the other half. Irrespective of this shortcoming, some comments may still be relevant.

To simplify the explanations, let us focus on the observations of Model (3) and Model (4), which only differ in the use of dummy variables: "WinTakeAll_2" and "WinTakeAll_4". Note that, in both models, we only include a single variable for sport achievements: "PointPerTourn_2007", implying that the same estimated slope is enforced for men and

women. Within this framework, the negative sign, along with the statistically significant level of the estimator for "Women_Dummy" (a qualitative variable collecting the women in the sample) indicates that the women's money prizes are smaller in size compared to those of men for a similar number of points in the respective WTA and ATP tours.

Table 6.2. Regression of: Money Prize per Tournament against Sport Performance

	Model (1)			**Model (2)**			**Model (3)**			**Model (4)**		
	Coeff.		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**		**t-stat**
WinTakeAll_2	82.684	***	(3.86)				114.94	***	(2.78)			
WinTakeAll_4	37.485	*	(1.76)				51.691	***	(3.37)			
ATPperTourn	0.6550	***	(8.81)	0.7989	***	(8.23)						
WTAperTourn	0.4469	***	(21.50)	0.4694	***	(25.41)						
PointperTourn							0.4604	***	(25.27)	0.5150	***	(15.47)
Women_Dum	0.5265		(0.47)	2.0322		(1.48)	-2.6808	***	(-4.86)	-3.3340	***	(-3.91)
Constant	-2.0741	**	(-2.00)	-3.830	***	(-2.90)	0.6424		(1.37)	0.3316		(0.72)
Number obs.	1378			1378			1378			1378		
% Women	50.65			50.65			50.65			50.65		
R-squared	**0.8860**			**0.8673**			**0.8736**			**0.8271**		
	ey/ex	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**
WinTakeAll_2	0.0259		0.003				0.0361		0.003			
WinTakeAll_4	0.0118		0.003				0.0162		0.003			
ATPperTourn	0.5121		7.235	0.6247		7.235						
WTAperTourn	0.6455		13.367	0.6781		13.367						
PointperTourn							1.0250		20.603	1.1467		20.603
Women_Dum	0.0288		0.506	0.1112		0.506	-0.1467		0.506	-0.1825		0.506

Statistical significance: *** p-value < 0.01; ** p-value < 0.05; ** p-value < 0.1. (t-statistic) in parenthesis.

The interpretation of this empirical finding may be simply due to the fact that there are many tennis tournaments where equal price policies are not adopted. We believe that this may of course be the case; nonetheless, the result is inconclusive for several reasons:

(i) As has already been mentioned, men and women play separately in two groups, implying that the number of points accumulated by individuals in each group is not perfectly comparable with those of the other group.

(ii) According to the elasticities (estimated at the mean) for "ATPperTourn" and "WTAperTourn" of models (1) and (2), the result seems to be the opposite: in proportional terms, women receive larger increases in money prizes than men in response to a percentage point increase in sport attainment.

(iii) Finally, and most importantly, from an economic perspective, the critical issue is not so much about matching money rewards to the number of points, but rather to determine whether the earnings of tennis players are congruent with the amount of business and economic added value they actually produce, which can be much better appraised by the ESI media value index.

As a result of the above reflections, we prefer the empirical estimations in Table 6.3, which deliver meaningful and reliable outcomes. The structure of these models is essentially based on the relationship between money prizes per tournament (again the

same dependent variable) and a set of explanatory variables, where the main one consists of media value ratings and is denoted "MediaValue_Mix" (or "mv_Mix").[11] We have already clarified that this measure of media value, entering into the regressions, is the joint index shown in Table 3.3 and reported in the Appendix.

Table 6.3. Regression of the Model: Money Prize per Tournament against Media Value

	Model (5)			**Model (6)**			**Model (7)**			**Model (8)**		
	Coeff.		**t-stat**	**Coeff.**		**t-stat**	**Coeff.**			**Coeff.**		**t-stat**
mvMix_Men	5.4982	***	(5.47)									
mvMix_Wom	9.9247	***	(6.84)									
mvMix				6.8913	***	(9.56)	6.7212	***	(8.79)	6.6947	***	(8.30)
Women_Dum	2.0047		(1.52)	5.9421	***	(5.49)	13.5081	***	(5.69)	19.0748	***	(5.40)
No_language	5.2001	***	(4.77)	5.4187	***	(4.45)	12.1679	***	(4.09)	15.5907	***	(3.43)
Constant	0.9226		(-0.81)	-2.8192	***	(-2.71)	-5.5216	***	(-2.91)	-8.0732	***	(-3.02)
Number obs.	1378			1378			600			400		
% Women	50.65			50.65			39.67			37.50		
R-squared	**0.6240**			**0.5733**			**0.5815**			**0.5843**		
	ey/ex	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**	**ey/ex**	at	**mean**
mvMix_Men	0.3852		0.648									
mvMix_Wom	0.3842		0.358									
MVmix				0.7495		1.006	0.8127		2.264	0.8633		3.248
Women_Dum	0.1097		0.506	0.3252		0.506	0.2861		0.396	0.2839		0.375
No_language	0.2206		0.392	0.2299		0.392	0.1960		0.301	0.1733		0.280

Statistical significance: *** p-value < 0.01; ** p-value < 0.05; ** p-value < 0.1. (t-statistic) in parenthesis.

The specification of this preferred model overcomes all the drawbacks associated with the approach based solely on the sport performance records. The model is presented in four versions, to robustly determine whether women or men are paid in excess of their contribution to the business, which is the question of interest.

Moreover, the results are checked for robustness by using diverse specifications of the model. The first procedure is shown in Model (5), where two variables for the players' media value ("mvMix_Men" and "mvMix_Wom") are included to separately treat the groups of men and women. The estimated slopes – positive, significant and statistically very different – predict that women tennis players receive higher earnings than men, at any given level of media value: the coefficients are, respectively, 9.924 and 5.498.

More revealing than a deeper examination of Model (5) is to review the estimations of the other three models. Strictly speaking, all three are actually a single case, given that Model (7) and Model (8) are mere replications of the same specification of Model (6) for different sub-samples. As can be seen subsequently, the regressions when using smaller sample sizes, of either 600 or 400 players, yield similar results.

The specification of Model (6) is more suitable, than Model (5), for comparing the new estimations with those in Table 6.2. More importantly, its interpretation is

[11] In this case, we have not included "WinTakeAll_2" or "WinTakeAll_4" as regressors, as they are not statistically significant. This is not surprising because the winner-take-all effect is already implicitly taken into account, as Section 4 shows, by the inclusion of "MediaValue_Mix" in the set of independent variables.

straightforward, and the similarity of the results, across the three versions of the model, supports the soundness of the conclusions. Under this approach, instead of dividing the main explanatory variable (using both "mvMix_Men" and "mvMix_Wom" permitted the estimation of different slopes for men and women), we include a single "mvMix" variable, accompanied by a dummy variable capturing all the women in the sample.

This is possibly the simplest and most convincing procedure to provide a truthful answer to our question. The whole point consists of testing if the estimated coefficient of "Women_Dummy" (a qualitative variable controlling for female players) is statistically significant. A negative and significant coefficient indicates that women are paid less than the amount their media value deserves, and the opposite interpretation follows if the sign is positive and significant. Table 6.3 presents the regressions for 3 different sample sizes of the model. The explanatory power in all the cases is high (R-squared of approximately 0.58). More importantly, the estimated coefficient of "Women_Dummy" is statistically positive and highly significant, implying that women are paid above the economic value they generate, at least according to the perceptions of the public and the media.

Regarding the quantitative interpretation, the estimations of the elasticity convey very informative outcomes. In Model (6), the elasticity is as high as 0.3252, meaning that the earnings of a tennis player increase by approximately 33% simply by the player being a woman.[12] Notice also that constraining the sample to the 600 or 400 most relevant players does not alter this conclusion (in this case the figure is approximately 28%). The results reported in Table 6.3 do not seem to permit another interpretation.

In conclusion, the current situation in the tennis industry is such that women are typically overpaid with respect to men, at least according to the media value approach adopted here. Provided that media value status determines the potential capacity to attract revenues, this finding implies that the current situation of the tennis industry is in clear disagreement with the usual economic views and recommendations. Therefore, our study called into question equal prize policies, provided there is some concern for not compromising the rules of economic rationality and efficiency.

7. Concluding remarks

In this study, we have pursued various objectives. First, we have presented and described the principal aspects of the ESI methodology, which we consider a reliable procedure to evaluate the economic value of intangible assets in sports. We have explained how the ESI approach establishes rankings of the intangible talent of players, a task carried out by appraising the level of a player's exposure in the mass media. In this way, ESI calculations provide individual assessments on the media value of players participating in a wide variety of sporting competitions, at any moment in time.

[12] Remember that, to be precise, an elasticity is not a fixed number but varies along with the different values taken by the variables involved. Thus, if in Model (6) ey/ex () = 0.3252, this means that earnings (money prizes per tournament) would increase by approximately 33%. However, this is only true under the assumption that the percentage rate is constant, which is not precisely the case.

Among the other strengths of the ESI methodology, the homogeneity of its rankings must be stressed. Thanks to the accurate and comparable ratings of media value generated by ESI, we can easily compute rankings and make comparisons (in terms of media value) between players and over time. Then, from individual figures, we can also infer the overall media value of tournaments or leagues, as well as the collective media value of groups of individuals who meet specific criteria or belong to particular teams.

To study the tennis industry, we have used ESI data set, which comprises weekly records of the top 1,400 professional tennis players (700 women in the WTA and 700 men in the ATP in the 2007 season). To rank the media value of tennis players, we follow the basic guidelines of the ESI methodology by combining the notions of notoriety and popularity.

After having computed the ESI media value index for the 1,400 most relevant tennis players in the world, our analysis reveals that, in 2007, Roger Federer was the absolute leader in terms of media value; while Rafael Nadal, who was second, came close to him. Among the ladies, Justine Henin received the third position in the mixed raking, and is considered the most valuable female player in 2007. Then, note that Sharapova is the second-ranked woman (in spite of ranking only 5^{th} in the WTA tour) and even holds the 6^{th} position in the mixed ranking. Sharapova received a share of attention that exceeds the rank she would deserve in terms of sport performance. Additionally, five women are found among the top ten players in the world.

Our study has provided insights on other relevant aspects, such as the concentration of media value. Some information may help to summarise the finding that a small number of superstar players absorb most of the attention in the media: The top 20 tennis players (out of 1,400) generate 30% of the total media value in tennis. If the analysis is restricted to the leading 10 players of each sex, we find that just 10 individuals account for 27% of the total interest generated by men (700 men in the data set, which is less than the 1.8% of the sample), while this figure is approximately 37% for women.

To reach a better understanding on the topic, we have also investigated the sources of media value in tennis. In this context, we have estimated the extent to which sport performance explains the media value level (as well as the popularity and notoriety) of players. In line with previous studies conducted for other sports industries, we find that sport performance largely determines the media value status of tennis players.

The investigation of the size and significance of the estimated coefficients reveals interesting aspects. On one side, sport achievements have a decisive influence on the media value levels of players. On the other side, current performance is found to be relatively more relevant (compared to past performance) for predicting the notoriety level than it is for the popularity level.

The study also examines the influence of non-sport related factors on the media value status of individuals, revealing that women are more dependent than men on their personal characteristics. This bias, even if not enormous, hints at the existence of factors not directly related to sport quality and to stereotypes that could be affecting the opportunities offered to women in certain labour markets.

Once the rankings of media values of the tennis players had been determined, we were in well positioned to explore other relevant issues related to the competitive structure of the tennis industry. For instance, as previous ESI reports had found for other sports, we

find that the potential earnings of tennis players can be better predicted using media value records rather than sport performance indicators alone.

Finally, the richness of ESI data set has allowed us to confront the current debate on equal money prize policies in tennis tournaments. The issue has been examined in light of the contribution to spectacle that tennis players generate, as evaluated by the ESI media value index. Interestingly, we find that men are responsible for 65% of the total media value generated in tennis. Accordingly, female players competing in the WTA only represent 35% of the worldwide global interest in the mass media. The estimations from the regression models provide empirical evidence that the gap in money prizes between men and women is smaller than the difference in terms of media value contribution. Therefore, by stressing the uneven contribution to the spectacle by men and women, our study calls into question the prevailing equal prize practices in Grand Slam tournaments.

In conclusion, from an economic perspective, policies of equal money prizes are unlikely to be compatible with economic efficiency. This is because women contribute to the provision of spectacle (by tournament) in a lesser degree than men, despite the winners for each sex receiving identical money prizes. This statement seems conclusive, as similar results have been obtained through various models. Although there might be a number of good reasons for defending equitable reward schemes, our point is simply to consider this to be incongruent with economic efficiency and rationality. For instance, from the perspective of the organisers of tennis tournaments or sponsorship companies, reward systems of money prizes could be more efficiently designed if the actual (effective) contribution of the agents involved in the spectacle are taken into account.

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DATA APPENDIX

Ranking	Joint Media Value 2007		April	May	June	July	Aug	Sept	Oct	2007Average
1	Roger Federer	**ATP**	63.5	55.2	58.6	51.8	48.1	57.4	35.3	**52.9**
2	Rafael Nadal	**ATP**	64.0	51.1	68.6	54.0	43.8	27.3	19.2	**46.8**
3	JUSTINE HENIN	**WTA**	27.2	28.1	35.4	27.4	28.6	36.8	19.5	**29.0**
4	Andy Roddick	**ATP**	17.7	20.5	25.6	32.4	33.7	33.5	18.3	**25.9**
5	Novak Djokovic	**ATP**	18.4	17.9	27.6	17.8	26.1	34.7	25.4	**24.0**
6	MARIA SHARAPOVA	**WTA**	16.6	21.4	31.5	29.0	25.1	24.1	13.5	**23.0**
7	VENUS WILLIAMS	**WTA**	12.7	16.3	20.1	33.8	26.1	29.0	20.1	**22.6**
8	SERENA WILLIAMS	**WTA**	18.9	22.3	27.3	24.8	23.1	24.9	14.6	**22.3**
9	JELENA JANKOVIC	**WTA**	14.0	21.2	27.6	11.9	18.7	23.0	14.2	**18.7**
10	SVETLANA KUZNETSOVA	**WTA**	16.6	17.1	16.2	12.3	18.2	27.9	18.9	**18.2**
11	Nikolay Davydenko	**ATP**	18.4	18.4	20.0	10.8	20.4	22.5	15.4	**18.0**
12	James Blake	**ATP**	12.3	13.5	12.2	13.5	22.0	21.3	15.9	**15.8**
13	Lleyton Hewitt	**ATP**	14.9	21.0	22.6	13.2	12.6	11.2	10.8	**15.2**
14	AMELIE MAURESMO	**WTA**	21.6	21.2	21.8	19.2	6.3	6.0	8.1	**14.9**
15	ANA IVANOVIC	**WTA**	12.6	14.3	27.7	14.1	12.9	11.4	8.0	**14.4**
16	Carlos Moya	**ATP**	17.4	17.7	19.0	12.1	12.9	12.4	7.7	**14.2**
17	Fernando Gonzalez	**ATP**	22.4	21.1	12.7	8.2	8.0	10.0	13.3	**13.7**
18	David Ferrer	**ATP**	16.1	12.0	7.1	8.4	15.6	19.5	13.0	**13.1**
19	Tommy Robredo	**ATP**	18.4	16.7	17.0	8.9	8.2	7.5	9.2	**12.3**
20	Richard Gasquet	**ATP**	17.0	13.9	11.9	17.1	6.7	7.2	11.4	**12.2**
21	Andy Murray	**ATP**	12.2	9.1	8.3	9.3	11.0	11.2	17.2	**11.2**
22	MARTINA HINGIS	**WTA**	14.7	12.4	10.9	10.0	11.3	10.7	6.6	**10.9**
23	Tomas Berdych	**ATP**	17.8	12.4	9.5	10.0	6.9	8.5	10.1	**10.7**
24	Marat Safin	**ATP**	13.8	14.1	12.8	12.5	7.7	6.0	6.5	**10.5**
25	Andre Agassi	**ATP**	14.1	13.4	13.9	9.3	7.2	7.4	7.7	**10.4**
26	Guillermo Canas	**ATP**	18.1	15.5	15.5	6.7	5.3	4.0	5.9	**10.2**
27	MARION BARTOLI	**WTA**	6.0	7.6	10.7	19.9	9.0	8.2	7.8	**9.9**
28	Tommy Haas	**ATP**	9.2	7.9	7.0	10.0	10.7	12.6	11.7	**9.9**
29	Juan Carlos Ferrero	**ATP**	15.9	12.6	10.2	11.6	5.2	3.5	5.1	**9.2**
30	Ivan Ljubicic	**ATP**	10.6	11.9	12.0	5.3	4.9	6.4	8.7	**8.5**
31	ANNA CHAKVETADZE	**WTA**	5.1	5.6	8.0	9.8	11.7	13.0	6.7	**8.5**
32	Juan Ignacio Chela	**ATP**	13.0	11.8	6.7	5.5	8.4	8.1	4.4	**8.3**
33	Tim Henman	**ATP**	6.7	6.4	8.9	9.9	8.2	8.5	7.3	**8.0**
34	ELENA DEMENTIEVA	**WTA**	9.2	12.0	9.5	5.7	6.1	4.6	8.8	**8.0**
35	PATTY SCHNYDER	**WTA**	10.5	12.3	9.7	8.3	6.8	3.8	4.2	**7.9**
36	Marcos Baghdatis	**ATP**	11.5	10.4	11.6	8.5	4.4	4.3	4.3	**7.8**
37	Filippo Volandri	**ATP**	20.8	16.6	7.7	4.0	2.3	1.6	1.6	**7.8**
38	Juan Monaco	**ATP**	7.3	9.8	6.5	6.7	9.1	8.4	6.5	**7.8**
39	David Nalbandian	**ATP**	9.8	9.8	11.0	6.2	6.3	4.8	4.6	**7.5**
40	Igor Andreev	**ATP**	10.5	10.9	12.5	4.8	3.2	3.4	6.4	**7.4**
41	DANIELA HANTUCHOVA	**WTA**	7.0	8.4	8.0	6.9	4.3	6.5	9.3	**7.2**
42	NADIA PETROVA	**WTA**	10.5	8.3	6.2	7.5	6.6	4.8	5.8	**7.1**
43	Philipp Kohlschreiber	**ATP**	13.2	9.6	6.4	3.4	2.9	4.5	6.8	**6.7**
44	Mikhail Youzhny	**ATP**	9.4	9.5	8.6	6.1	3.8	3.8	5.1	**6.6**
45	Thomas Johansson	**ATP**	6.0	4.2	4.0	5.9	6.4	7.7	11.2	**6.5**
46	David Martin	**ATP**	0.9	0.7	0.7	6.1	11.3	12.0	13.2	**6.4**
47	NICOLE VAIDISOVA	**WTA**	4.3	9.2	13.8	8.4	2.9	2.6	3.0	**6.3**
48	Paul-Henri Mathieu	**ATP**	8.8	7.9	7.8	7.8	4.1	2.4	5.0	**6.2**

49	Gael Monfils	**ATP**	6.1	9.7	8.3	9.3	4.8	2.7	2.5	**6.2**
50	Michael Russell	**ATP**	0.9	5.8	5.8	4.7	7.9	8.1	9.1	**6.1**
51	Radek Stepanek	**ATP**	7.4	6.8	4.8	6.2	7.5	4.1	5.1	**6.0**
52	LINDSAY DAVENPORT	**WTA**	4.7	4.6	5.1	5.7	4.1	7.2	9.3	**5.8**
53	TATIANA GOLOVIN	**WTA**	5.2	3.8	4.0	7.0	4.9	5.0	10.2	**5.7**
54	DINARA SAFINA	**WTA**	7.0	8.0	6.9	2.9	4.8	4.5	5.2	**5.6**
55	Nicolas Almagro	**ATP**	10.1	9.5	3.9	5.2	4.8	3.0	1.6	**5.4**
56	Gaston Gaudio	**ATP**	10.9	9.5	6.3	3.5	2.3	2.0	2.2	**5.3**
57	kournikova	**WTA**					3.6	5.4	6.0	**5.0**
58	SANIA MIRZA	**WTA**	3.6	3.9	4.1	6.9	6.6	4.3	4.8	**4.9**
59	Fernando Verdasco	**ATP**	4.2	4.2	5.9	5.3	5.0	4.0	5.5	**4.9**
60	Nicolas Massu	**ATP**	9.0	8.4	4.6	3.3	2.3	2.4	3.1	**4.7**
61	Martin Lee	**ATP**	0.3	0.2	0.2	4.6	8.5	9.0	9.9	**4.7**
62	Arnaud Clement	**ATP**	6.4	5.9	7.2	4.4	3.7	2.4	2.8	**4.7**
63	Andre Sa	**ATP**	0.4	0.4	0.4	4.7	8.1	8.9	9.7	**4.7**
64	Benjamin Becker	**ATP**	6.4	4.9	4.8	3.7	3.7	3.5	5.2	**4.6**
65	Gilles Simon	**ATP**	6.4	5.1	3.4	5.4	4.5	3.6	3.4	**4.6**
66	SHAHAR PEER	**WTA**	5.2	5.1	4.2	3.2	5.4	4.7	3.9	**4.5**
67	Brian Wilson	**ATP**	2.3	1.7	1.6	4.5	6.6	7.0	7.9	**4.5**
68	MARY PIERCE	**WTA**					3.6	5.0	4.9	**4.5**
69	Matthew Smith	**ATP**	0.2	0.2	0.2	3.9	8.2	8.8	10.0	**4.5**
70	Mardy Fish	**ATP**	4.3	5.1	4.0	5.1	5.4	4.3	2.9	**4.5**
71	David Novak	**ATP**	0.0	0.0	0.0	2.0	8.0	12.7	8.4	**4.4**
72	Nicolas Kiefer	**ATP**	3.0	3.3	4.1	6.6	4.6	4.2	5.0	**4.4**
73	Donald Young	**ATP**	0.5	0.4	0.4	3.9	8.9	8.8	7.8	**4.4**
74	Agustin Calleri	**ATP**	8.8	6.8	3.6	3.4	4.1	2.4	1.5	**4.4**
75	Jarkko Nieminen	**ATP**	8.4	6.5	5.0	2.2	2.8	2.4	3.2	**4.4**
76	Simon Rea	**ATP**	0.1	0.0	0.0	4.0	8.0	8.6	9.0	**4.3**
77	Sebastien Grosjean	**ATP**	7.5	5.9	4.6	2.7	3.0	2.6	3.2	**4.2**
78	Olivier Rochus	**ATP**	6.1	5.8	4.7	2.6	1.9	3.1	5.3	**4.2**
79	Stanislas Wawrinka	**ATP**	3.7	3.4	2.0	4.1	5.4	4.6	6.1	**4.2**
80	Ivo Karlovic	**ATP**	1.8	2.3	4.8	4.1	4.4	3.3	8.6	**4.2**
81	FRANCESCA SCHIAVONE	**WTA**	3.3	3.6	3.7	5.1	3.8	4.6	5.2	**4.2**
82	Lee Childs	**ATP**	0.1	0.1	0.3	3.8	7.3	8.3	9.4	**4.2**
83	Jonas Bjorkman	**ATP**	2.0	4.3	7.7	4.0	2.0	4.1	5.0	**4.2**
84	Feliciano Lopez	**ATP**	2.8	2.3	3.1	5.3	5.3	5.1	4.8	**4.1**
85	Dmitry Tursunov	**ATP**	3.3	2.7	3.8	4.4	3.6	4.2	6.6	**4.1**
86	Phillip King	**ATP**	0.1	0.1	0.1	3.7	7.3	8.0	8.7	**4.0**
87	Fabrice Santoro	**ATP**	2.7	3.9	5.1	5.6	3.1	3.5	3.9	**4.0**
88	Kevin Anderson	**ATP**	0.9	1.0	0.7	3.4	6.4	7.2	7.9	**3.9**
89	Marc Lopez	**ATP**	0.3	0.3	0.2	3.5	7.2	8.0	8.1	**3.9**
90	Albert Costa	**ATP**	1.4	1.3	1.4	3.5	6.1	6.8	6.5	**3.9**
91	MARA SANTANGELO	**WTA**	4.8	5.2	5.9	3.8	1.7	2.7	2.8	**3.9**
92	Oscar Hernandez	**ATP**	7.8	6.0	3.4	2.1	2.4	2.5	2.4	**3.8**
93	Kevin Kim	**ATP**	0.5	0.5	0.7	4.2	6.5	6.9	7.2	**3.8**
94	Greg Jones	**ATP**	0.3	0.2	0.5	3.6	6.6	7.2	8.1	**3.8**
95	Potito Starace	**ATP**	6.7	5.9	3.9	3.1	2.3	1.7	3.0	**3.8**
96	ANABEL MEDINA	**WTA**	5.2	6.9	4.8	2.1	2.2	2.5	2.2	**3.7**
97	SYBILLE BAMMER	**WTA**	3.6	4.5	5.4	2.8	3.7	3.0	2.8	**3.7**
98	Kristof Vliegen	**ATP**	5.7	5.5	4.8	2.8	1.7	1.9	3.1	**3.7**
99	Jordane Doble	**ATP**	0.0	0.0	0.0	3.1	6.8	7.4	8.1	**3.6**
100	Florian Mayer	**ATP**	4.3	5.8	5.1	2.8	2.8	2.1	2.1	**3.6**

101	Alberto Martin	**ATP**	2.8	2.3	1.5	3.0	4.6	5.0	5.5	**3.5**
102	Juan Martin Del Potro	**ATP**	1.9	4.2	6.3	3.1	3.4	2.9	2.2	**3.4**
103	NATHALIE DECHY	**WTA**	5.3	4.2	4.2	3.2	2.6	2.3	2.0	**3.4**
104	Julien Benneteau	**ATP**	5.7	5.5	4.2	2.1	2.4	1.6	2.3	**3.4**
105	Robin Soderling	**ATP**	6.8	4.3	3.5	6.2	1.2	0.9	1.0	**3.4**
106	Jose Acasuso	**ATP**	5.6	5.0	2.6	2.9	3.8	2.3	1.5	**3.4**
107	Marcos Daniel	**ATP**	0.6	1.2	0.9	3.6	6.0	6.6	4.3	**3.3**
108	Martin Fischer	**ATP**	0.1	0.1	0.1	3.1	6.3	6.7	6.7	**3.3**
109	FLAVIA PENNETTA	**WTA**	3.6	2.3	2.4	2.3	1.6	3.0	7.7	**3.3**
110	MARIA KIRILENKO	**WTA**	2.5	2.1	2.3	2.4	3.1	3.8	6.1	**3.2**
111	Daniel Brands	**ATP**	1.2	0.5	0.1	2.8	5.5	5.9	6.1	**3.2**
112	Nicolas Mahut	**ATP**	1.7	2.1	5.9	4.6	1.6	2.2	3.9	**3.1**
113	KATARINA SREBOTNIK	**WTA**	3.5	3.6	4.1	3.2	2.7	2.2	2.8	**3.1**
114	Michael Berrer	**ATP**	0.3	0.2	1.0	3.5	4.4	4.9	7.2	**3.1**
115	MICHAELLA KRAJICEK	**WTA**	3.2	4.2	4.5	4.1	2.2	1.4	2.1	**3.1**
116	GISELA DULKO	**WTA**	5.5	3.9	2.7	1.9	2.4	2.2	2.9	**3.1**
117	LUCIE SAFAROVA	**WTA**	3.8	4.7	5.1	2.3	2.2	1.7	1.5	**3.0**
118	VIRGINIE RAZZANO	**WTA**	2.5	1.8	2.2	1.3	2.9	2.9	7.0	**3.0**
119	EMILIE LOIT	**WTA**	3.0	4.8	3.9	2.8	2.3	1.5	2.1	**2.9**
120	Janko Tipsarevic	**ATP**	1.3	3.1	4.3	3.1	1.8	2.4	4.2	**2.9**
121	MARY PIERCE	**WTA**	3.1	3.6	4.2	3.5	2.6	1.5	1.6	**2.9**
122	Alexander Waske	**ATP**	6.1	4.4	1.8	1.6	1.2	2.2	2.8	**2.9**
123	Albert Montanes	**ATP**	3.9	4.8	3.5	2.6	2.3	1.3	1.5	**2.8**
124	JULIA VAKULENKO	**WTA**	7.9	4.8	1.3	0.6	2.0	1.9	1.3	**2.8**
125	ALONA BONDARENKO	**WTA**	5.8	5.2	2.6	1.4	1.6	1.4	1.6	**2.8**
126	AGNES SZAVAY	**WTA**	1.0	0.7	0.7	1.3	5.3	7.3	3.2	**2.8**
127	Gustavo Kuerten	**ATP**	3.1	3.3	4.0	1.9	1.4	2.3	3.4	**2.8**
128	Robby Ginepri	**ATP**	2.5	3.2	4.1	2.1	3.2	2.5	1.8	**2.8**
129	Guillermo Coria	**ATP**	4.0	3.8	3.9	2.3	1.7	1.8	1.7	**2.7**
130	Jurgen Melzer	**ATP**	3.7	4.0	2.8	1.0	1.8	2.4	3.5	**2.7**
131	Andrei Pavel	**ATP**	3.4	2.0	2.5	3.5	2.7	2.4	2.6	**2.7**
132	AKIKO MORIGAMI	**WTA**	4.3	2.3	1.8	6.0	1.5	1.2	1.8	**2.7**
133	AI SUGIYAMA	**WTA**	3.7	2.6	3.2	3.2	2.6	1.7	1.7	**2.7**
134	Max Mirnyi	**ATP**	3.6	2.8	4.0	2.0	2.4	2.3	1.4	**2.6**
135	TAMIRA PASZEK	**WTA**	2.5	3.0	4.0	2.7	1.8	2.4	1.8	**2.6**
136	Mario Ancic	**ATP**	3.1	2.8	2.5	2.1	2.3	2.2	3.0	**2.6**
137	SAMANTHA STOSUR	**WTA**	4.4	4.8	3.7	1.7	1.3	1.1	0.8	**2.6**
138	TATHIANA GARBIN	**WTA**	4.7	3.8	3.6	2.7	1.4	0.8	0.6	**2.5**
139	Hyung-Taik Lee	**ATP**	1.4	1.5	1.5	3.7	3.7	3.1	2.8	**2.5**
140	Stefan Koubek	**ATP**	1.1	1.9	1.5	3.1	2.5	2.6	5.0	**2.5**
141	Juan Antonio Marin	**ATP**	0.4	0.2	0.2	2.3	4.6	5.1	4.7	**2.5**
142	Florent Serra	**ATP**	3.3	3.1	2.7	3.7	1.6	0.9	2.0	**2.5**
143	Luis Horna	**ATP**	1.7	3.7	2.5	2.9	2.0	2.1	2.1	**2.4**
144	AGNIESZKA RADWANSKA	**WTA**	1.1	2.3	2.2	1.9	3.7	3.2	2.6	**2.4**
145	CAMILLE PIN	**WTA**	3.1	2.7	2.1	2.3	2.3	1.5	2.9	**2.4**
146	ELENA VESNINA	**WTA**	1.7	3.3	2.6	3.2	1.5	1.7	2.7	**2.4**
147	MEGHANN SHAUGHNESSY	**WTA**	2.6	3.6	3.5	1.7	2.1	1.8	1.3	**2.4**
148	VICTORIA AZARENKA	**WTA**	3.5	2.0	0.8	1.3	2.7	2.6	3.8	**2.4**
149	VERA ZVONAREVA	**WTA**	2.2	2.2	2.1	1.4	1.7	2.6	4.3	**2.4**
150	ANASTASIA MYSKINA	**WTA**	2.7	3.9	4.2	1.9	1.2	1.2	1.3	**2.3**
151	Andreas Seppi	**ATP**	2.2	1.5	1.4	4.2	2.1	1.3	3.7	**2.3**
152	Marc Gicquel	**ATP**	3.5	2.6	3.1	2.8	1.5	1.4	1.6	**2.3**

153	Diego Cristin	**ATP**	0.0	0.0	0.0	2.1	4.3	5.0	4.9	**2.3**
154	Pablo Gonzalez	**ATP**	0.3	0.2	0.1	2.3	4.0	4.4	4.9	**2.3**
155	NA LI	**WTA**	2.3	2.5	1.8	4.8	3.7	0.4	0.4	**2.3**
156	Dominik Hrbaty	**ATP**	4.4	3.1	2.0	1.6	2.2	1.4	1.1	**2.3**
157	Rainer Schuettler	**ATP**	4.6	2.9	1.1	0.7	0.7	2.0	3.5	**2.2**
158	KAIA KANEPI	**WTA**	3.2	3.4	3.3	2.2	1.4	1.0	0.9	**2.2**
159	Dick Norman	**ATP**	0.5	0.5	0.5	3.1	3.5	3.7	3.5	**2.2**
160	ALICIA MOLIK	**WTA**	1.7	2.0	3.0	2.9	1.3	1.5	2.7	**2.2**
161	Frank Dancevic	**ATP**	0.4	0.4	0.9	4.6	4.8	1.5	2.4	**2.1**
162	VANIA KING	**WTA**	3.1	2.0	1.5	2.5	1.3	1.4	3.0	**2.1**
163	Daniel Yoo	**ATP**	0.0	0.0	0.0	1.8	3.8	4.4	4.5	**2.1**
164	Olivier Patience	**ATP**	2.1	3.3	3.6	1.5	1.7	1.3	1.2	**2.1**
165	Fernando Vicente	**ATP**	0.7	2.3	1.9	1.8	2.4	2.7	2.7	**2.1**
166	Sergio Roitman	**ATP**	1.7	2.5	2.5	2.9	2.0	1.1	1.5	**2.1**
167	SEVERINE BREMOND	**WTA**	3.6	2.9	2.0	2.7	1.3	0.8	1.0	**2.0**
168	ALIZE CORNET	**WTA**	1.4	3.4	4.2	0.7	1.4	1.8	1.4	**2.0**
169	Nicolas Lapentti	**ATP**	0.9	2.7	2.8	2.7	1.7	1.2	1.9	**2.0**
170	Alberto Francis	**ATP**	0.0	0.0	0.0	1.9	3.7	4.1	4.0	**2.0**
171	ELENI DANIILIDOU	**WTA**	2.3	1.5	1.4	1.2	1.7	2.5	3.1	**2.0**
172	LISA RAYMOND	**WTA**	2.6	1.5	1.6	3.8	2.1	1.1	0.9	**1.9**
173	Santiago Gonzalez	**ATP**	0.3	0.4	0.3	2.2	3.3	3.3	3.7	**1.9**
174	Morgan Phillips	**ATP**	0.0	0.0	0.0	1.7	3.7	4.1	3.9	**1.9**
175	Michael Llodra	**ATP**	1.2	2.2	2.7	2.2	1.4	1.4	2.4	**1.9**
176	Sam Querrey	**ATP**	1.8	1.8	1.8	2.2	2.8	1.7	1.3	**1.9**
177	James Pade	**ATP**	0.0	0.0	0.0	1.9	3.7	4.0	3.7	**1.9**
178	Jonathan Marray	**ATP**	0.1	0.1	0.3	1.3	3.3	4.0	4.2	**1.9**
179	Paul Capdeville	**ATP**	1.1	1.9	1.7	2.1	2.1	2.2	2.0	**1.9**
180	Mariano Zabaleta	**ATP**	1.5	2.3	2.3	2.6	2.0	1.3	1.0	**1.8**
181	Christopher Lam	**ATP**	0.0	0.0	0.0	1.6	3.4	3.9	3.4	**1.8**
182	Carlos Berlocq	**ATP**	0.9	2.3	2.3	2.2	1.4	1.4	1.8	**1.8**
183	Albert Portas	**ATP**	0.6	0.5	0.4	1.5	2.9	3.3	3.0	**1.8**
184	Mark Philippoussis	**ATP**	2.4	2.2	2.3	2.1	1.3	1.0	1.0	**1.8**
185	ROBERTA VINCI	**WTA**	1.9	1.4	1.1	2.6	2.3	2.0	1.1	**1.8**
186	JAMEA JACKSON	**WTA**	0.6	0.9	1.5	4.6	3.5	0.6	0.5	**1.8**
187	Jo-Wilfried Tsonga	**ATP**	0.6	0.3	2.6	1.9	2.3	2.2	2.2	**1.7**
188	Diego Hartfield	**ATP**	1.0	3.4	2.5	2.3	1.6	0.7	0.6	**1.7**
189	Lucas Engel	**ATP**	0.2	0.1	0.0	1.5	3.2	3.8	3.4	**1.7**
190	Jamie Baker	**ATP**	0.2	0.1	1.0	1.6	2.6	3.1	3.4	**1.7**
191	Amer Delic	**ATP**	1.9	2.7	2.1	1.1	1.7	1.4	1.0	**1.7**
192	Paul Goldstein	**ATP**	1.7	0.9	0.6	2.1	2.5	2.0	1.9	**1.7**
193	MILAGROS SEQUERA	**WTA**	1.4	3.3	2.9	2.5	1.0	0.2	0.2	**1.7**
194	Xavier Malisse	**ATP**	2.9	2.2	1.6	1.1	1.1	1.3	1.4	**1.7**
195	Ricardo Mello	**ATP**	1.1	0.9	0.7	1.9	2.0	2.1	2.8	**1.6**
196	Miles Armstrong	**ATP**	0.0	0.0	0.0	1.4	2.9	3.6	3.4	**1.6**
197	CATALINA CASTANO	**WTA**	1.6	2.7	2.0	1.1	1.1	1.2	1.6	**1.6**
198	Martin Vassallo Arguello	**ATP**	0.7	0.7	0.5	2.6	2.8	1.3	2.6	**1.6**
199	Tyler Cleveland	**ATP**	0.0	0.0	0.0	1.3	3.2	3.7	3.1	**1.6**
200	Greg Rusedski	**ATP**	2.2	1.8	2.0	1.8	1.1	1.1	1.3	**1.6**