

Online Poker in the European Union

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Abstract

Although online poker is a gold mine of data, until now nobody knows where the players and their money come from. It seems that the knowledge about the online poker market has not been able to keep up with the speed of its evolution in the past years. This paper is the first to shed light on this matter. We use data of 4,591,298 poker identities from the Online Poker Database of the University of Hamburg (OPD-UHH) collected over a six months period from 09/2009 to 03/2010. Since the EU-27 countries are of particular interest in this paper, we identified 2,905,925 active poker players for these countries who paid 1.62 billion US\$ rake to the operators in 2010 (on average 558 US\$ per player). We found Germany to be the biggest poker market of the EU-27 countries with a market size of 392 million US\$ and with 581 thousand players. Even though Germany is the biggest market in absolute terms, Finland is the biggest relative market with 15.40\$ spending per head. The main driver of the relative market size in a EU-27 country is the internet activity. Denmark is the country with the highest proportion (1.641%, 1 out of 61) of online poker player in regard to its population. In relation to the number of internet users Hungary has the highest proportion (1.983%, 1 out of 50) of online poker players.

Keywords: online, poker, market, EU-27.

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Introduction

Online gambling and online poker in particular is a relatively new phenomenon nearly nonexistent in 2003. During the past years it has grown extraordinarily so that it is now an important factor in the whole gambling market.

From an academic perspective, most research in the field of poker has focused on playing strategy (e.g. Chen/Ankenman, 2006) and especially the question whether poker is a game of skill or a game of chance (see e.g. Dreef et al. 2003, Cabot/Hannum 2005, Dedonno/Detterman 2008, or Turner 2008 and for an empirical point of view see Fiedler/Rock 2009).¹ Shaffer, Peller, LaPlante, Nelson & LaBrie 2010) did a search of the literature and identified 111 articles released through spring 2008 (excluding their own Internet gambling publications). Only ten of these articles met the criteria for quantitative empirical studies of Internet gambling. But none of them addressed the questions where the poker players come from and how much money they spend on online poker? And which factors determine the prevalence of online poker?

This is an empirical study to answer these and similar questions by investigating the EU-27 markets. We use data from the Online Poker Database of the University of Hamburg (OPD-UHH), a database including information on the origin and playing habits of 4,591,298 poker identities over a six months period.² At first we analyze the worldwide online poker market and the market shares of the various poker operators. Since our main interest is to enlighten the markets for EU-27 countries, we present the results about the gross market size of the EU-27 countries in absolute and in relative terms for the year 2010. Before analyzing the prevalence of online poker in relation to the population and the

¹ The answer to this question is especially important from a legal perspective as most jurisdictions legalize games of skill while they regulate games of chance. However, the skill/chance debate has not yet come to an end, and also skill does not seem to be the best criterion for the distinction between harmful and non-harmful games (Rock/Fiedler 2008).

² For a more detailed description regarding the Online Poker Database of the University of Hamburg (OPD-UHH) see Fiedler/Wilcke (2011). The description does not only include the collection of the data in the OPD-UHH, but also the calculation process regarding the number of poker identities and of active poker players.

internet users of the EU-27 countries we identify the main driver of the market size per country. We continue by discussing the results and give an outlook on further research in the last section.

Market Sizes per Country

The data in the OPD-UHH allows us to specify how many players in each country in the world and in Europe in particular play online poker for real money and how much rake they paid to the operators while playing.³ Using these data we determined the market sizes of the EU-27 countries in dollar terms and also the absolute and relative prevalence of online poker in each of the EU-27 countries. We linked this information to data about the average US\$ rake paid per player, hour, and table for the different poker variants and stakes.⁴ This allowed us to determine how much US\$ rake a player paid to the operator over the course of 6 months. As we also obtained the origin of the players, we could aggregate the rake paid for all observed players of each country. We then extrapolated this data to the whole market of each country by considering the market share of the observed operators in each country (88.4% in the USA, 57.4% in all other countries, resulting in 64.72% of the whole market). Multiplied by 2 we got the market size for online poker cash games for each country in 2010.⁵ Given that the operators earn about 70% of their revenues with cash games and 30% with tournaments we further extrapolated the market size to include the tournament revenues.⁶ The resulting gross market size is the rake paid by all online poker players in a given country. This is not identical with the players' net losses: 1) Players get about 30% of their rake back in form of Rakeback deals or bonuses⁷ and 2) players can win and lose money from other players, a cash flow we did not observe. To obtain the net losses, it is only necessary to account for the former point, which can be easily done by deducting 30% of the gross market size. The

³ The sum of the rake equals the players' losses.

⁴ For a more detailed description of this procedure, see main report of the research project: Fiedler/Wilcke, 2011.

⁵ Our data were from 09/09 to 03/10, but we assumed that these data are representative for 2010. Probably the market grew a little in this time, but we neglected this and conservatively decided that it did not so we can give a number for the whole year 2010.

⁶ This assumes that the share of revenues of the operators is 70% in every country.

⁷ The exact amount differs from operator to operator and also depends on the playing volume of the player. The higher the playing volume, the higher the rakeback.

latter point does not matter much for whole countries, because cash flows between the players converge to zero if the observed player pool are large (without rake, poker is a zero sum game).

Table 3 shows the results for the gross market size of the EU-27 countries in dollar terms, their share and their share of the total market for 2010. The biggest poker market is Germany with a market size of 392 million US\$. While Germany accounts for almost one quarter of the market size of the EU-27 countries, its total market share is about 11%. Other big markets are France (187 million US\$), Great Britain (160 million US\$) and the Netherlands (153 million US\$). Although the French market may now look different after online poker was legalized, licensed, taxed, and insulated from the other markets in 2010. In total, the players of the EU-27 countries paid about 1.62 billion US\$ rake to the operators in 2010 or 558 US\$ per player. Comparing the market of the EU-27 countries and the world market we can state that the EU-27 accounts for almost the half (44,96%) of the World market.

Rank	Country	Gross Market size 2010		
		Size in mil. US\$	Share EU-27	Share World Market
1	Germany	391.94	24.14%	10.85%
2	France	187.35	11.54%	5.19%
3	Great Britain	159.72	9.84%	4.42%
4	Netherlands	152.80	9.41%	4.23%
5	Spain	117.07	7.21%	3.24%
6	Sweden	99.25	6.11%	2.75%
7	Finland	80.93	4.98%	2.24%
8	Denmark	58.50	3.60%	1.62%
9	Hungary	47.78	2.94%	1.32%
10	Poland	47.09	2.90%	1.30%
11	Austria	46.58	2.87%	1.29%
12	Italy	40.38	2.49%	1.12%
13	Belgium	29.71	1.83%	0.82%
14	Greece	20.54	1.26%	0.57%
15	Portugal	19.86	1.22%	0.55%
16	Romania	19.26	1.19%	0.53%
17	Czech Republic	16.29	1.00%	0.45%
18	Estonia	15.51	0.96%	0.43%
19	Irland	14.34	0.88%	0.40%
20	Bulgaria	13.87	0.85%	0.38%
21	Lithuania	11.21	0.69%	0.31%
22	Slovenia	10.76	0.66%	0.30%
23	Latvia	10.50	0.65%	0.29%
24	Slovakia	4.86	0.30%	0.13%
25	Cyprus	2.78	0.17%	0.08%
26	Malta	2.56	0.16%	0.07%
27	Luxembourg	2.36	0.15%	0.07%
Total	EU-27	1,623.80	100%	44.96%
Total	World Market	3,611.59		

Table 3: Market size and market share for the EU-27 countries.

Besides the market size in absolute terms the spending per head (in US\$) of online poker is a key figure for describing the market for online poker in a country. Table 4 depicts the relative market size per population for the EU-27 countries. Accounting now for the information of the population in a country changes the ranking of the EU-27 countries: Finland has the biggest relative market with a spending per head of 15.40 US\$, followed by Estonia (12.01 US\$), Sweden (10.94 US\$), Denmark (10.61 US\$) and the

Netherlands (9.10 US\$). In total, each inhabitant of the EU-27 countries paid about 3.23 US\$ for online poker in 2010. Comparing this number to the world market we can state that the spending per head in the EU-27 countries is approximately six times higher than in the world market (0.53 US\$).

Rank	Country	Gross market size in mil. US \$ in 2010	Population	\$ per head
1	Finland	80.93	5,255,695	15.40
2	Estonia	15.51	1,291,170	12.01
3	Sweden	99.25	9,074,055	10.94
4	Denmark	58.50	5,515,575	10.61
5	Netherlands	152.8	16,783,092	9.10
6	Malta	2.56	406,771	6.29
7	Austria	46.58	8,214,160	5.67
8	Slovenia	10.76	2,003,136	5.37
9	Hungary	47.78	9,992,339	4.78
10	Germany	391.94	82,282,988	4.76
11	Luxembourg	2.36	497,538	4.74
12	Latvia	10.5	2,217,969	4.73
13	Lithuania	11.21	3,545,319	3.16
14	Ireland	14.34	4,622,917	3.10
15	Belgium	29.71	10,423,493	2.85
16	France	187.35	67,768,389	2.76
17	Great Britain	159.72	62,348,447	2.56
18	Cyprus	2.78	1,102,677	2.52
19	Spain	117.07	46,505,963	2.52
20	Bulgaria	13.87	7,148,785	1.94
21	Greece	20.54	10,749,943	1.91
22	Portugal	19.86	10,735,765	1.85
23	Czech Republic	16.29	10,201,707	1.60
24	Poland	47.09	38,463,689	1.22
25	Slovakia	4.86	5,470,306	0.89
26	Romania	19.26	21,959,278	0.88
27	Italy	40.38	58,090,681	0.70
Total	EU-27	1,623.80	502,671,847	3.23
Total	World Market	3,611.59	6,842,454,978	0.53

Table 4: Relative market size per population for the EU-27 countries.

Drivers of the Market Size per Country

To understand the drivers of the market for online poker, it is most useful to analyze the relative size of the markets because the absolute numbers mostly depend on the size of a country. In order to investigate the drivers of the market size per country, we focused on the spending per head and identified that the main driver for this number is the internet activity of a country. We used a simple regression model where we examined the relationship between one dependent variable and several independent variables. We operationalised spending per head (in US\$) as dependent variable and GDP per capita and internet activity as independent variables. We found that there is a significant relationship between spending per head and internet activity in a given country in the EU-27: If the internet activity rises by 1 percentage point the spending per head increase by 0.118 percentage points ($t=4.101$, $p<.001$).⁸ We illustrate this finding by giving the following two examples: If Finland rises its internet activity by 1 percentage point from 85,26%⁹ to 86.26%, the spending per head for online poker increases by 0.118 percentage points from 15.40 US\$ to 15.58 US\$. Giving another example, we can state if Italy rises its internet activity by 1 percentage point from 52.59%¹⁰ to 53.59%, the spending per head increases from 0.70 US\$ to 0.71 US\$. We also examined if the GDP per capita is a driver of the market size of a country. We did not find any significant influence for the GDP per capita on the spending per head ($t=-0.055$, $p>.10$).

Our findings concerning the drivers of the market size of the EU-27 countries differ from our findings of a previous analysis¹¹, where a simple regression model with the proportion of poker players per internet users per country and its GDP per capita yielded a significant influence: If the GDP per capita rises by 1,000 US\$, the proportion of online poker players increases by 0.009 percentage points ($t=5.786$, $p<.001$). Hence, we conclude that the GDP per capita has only an effect on the prevalence of online

⁸ See appendix for the operationalization of the simple linear regression.

⁹ According to Internet World Stats the internet activity of Finland is 85,25% for the year 2010.

¹⁰ According to Internet World Stats the internet activity of Italy is 59,59% for the year 2010

¹¹ For more detailed and profound information on this analysis, see main report of the research project: Fiedler/Wilcke, 2011.

poker when considering countries with a large spread of GDP per capita while it has no effect between high income countries. The findings are reasonable because we examined the world market in our previous analysis and had about 160 data points available in contrast to 27 data points for the EU market. Furthermore we only used one independent variable in the analysis of the world market in comparison to two independent variables we integrated in the present analysis. By adding further independent variables into the model the likelihood of these variables to be significant decreases.

Prevalence of Online Poker

Besides the market size the prevalence of online poker is also a key figure for describing the market for online poker in a country. Prevalence can be measured in absolute terms (how many people play poker in a country) and in relative terms (how many people play poker in relation to, for example, the population).

We derived the number of poker players in a country as follows: First, we used the country data¹² for the observed player identities and added the non identifiable identities proportionally.¹³ Then, we extrapolated the number by the market share of the observed sites during the data collection period. In a last step we calculated the number of active players by assuming that per 100 player identities 85 real persons exist (see reasoning above).

Yet, the absolute market sizes disregard the information of the size of a country. To know how large the proportion of online poker players is in a given country, the number of players has to be related to the population of the country. Table 5 depicts the proportion of online poker players in a population: Denmark has the highest proportion (1.641%.) of online poker player. In detail, one out of 61 Danish plays online poker for real money. Denmark is followed by Estonia (1.488%), the Netherlands (1.428%),

¹² For the players on Pokerstars and Cake Poker we obtained the city of origin. We used the city data base „World Cities“ from MaxMind to assign these players to countries.

¹³ For 11.38% of all observed player identities we could not determine their country of origin. Adding them proportionally to the observed player identities of each country implies that they are equally distributed among all countries. This may not be true as people from countries with stricter laws against online gambling have a higher incentive to hide their identity.

Finland (1.361%) and Hungary (1.226%). Regarding the size of the world market for online poker we can state that the EU-27 countries are almost seven times the size of it. 0.578% (1 out of 173) of all people in the EU-27 countries have played online poker for real money during the 6 months of the data collection in comparison to 0.088% (1 out of 1136) who played on the world market.

Rank	Country	Active players	Population	Players/Population
1	Denmark	90,532	5,515,575	1.641%
2	Estonia	19,212	1,291,170	1.488%
3	Netherlands	239,700	16,783,092	1.428%
4	Finland	71,543	5,255,695	1.361%
5	Hungary	122,482	9,992,339	1.226%
6	Sweden	102,333	9,074,055	1.128%
7	Luxembourg	4,754	497,538	0.956%
8	Slovenia	18,899	2,003,136	0.944%
9	Portugal	100,075	10,735,765	0.932%
10	Latvia	20,281	2,217,969	0.914%
11	Germany	581,350	82,282,988	0.707%
12	Austria	57,802	8,214,160	0.704%
13	France	445,860	67,768,389	0.688%
14	Lithuania	23,555	3,545,319	0.664%
15	Belgium	68,792	10,423,493	0.660%
16	Cyprus	6,445	1,102,677	0.585%
17	Bulgaria	40,876	7,148,785	0.572%
18	Spain	253,043	46,505,963	0.554%
19	Ireland	25,107	4,622,917	0.543%
20	Greece	47,002	10,749,943	0.437%
21	Great Britain	269,247	62,348,447	0.432%
22	Czech Rep.	42,272	10,201,707	0.414%
23	Romania	64,703	21,959,278	0.295%
24	Malta	1,146	406,771	0.282%
25	Slovakia	15,129	5,470,306	0.277%
26	Poland	88,281	38,463,689	0.230%
27	Italy	85,504	58,090,681	0.147%
TOTAL EU-27		2,905,925	502,671,847	0.578%
Total World Market		6,029,930	6,842,454,978	0.088%

Table 5: EU-27 countries with proportion of online poker players per population

But as not everybody has access to the internet, it is more meaningful to relate the number to the number of internet users in a country. This seems also to be reasonable as we have found the internet activity to be the main driver of the relative market size. Table 6 shows the proportion of online poker

players in a country per internet users for the EU-27. Accounting for the information of the internet users in a country changes the ranking of the countries. Among the countries with more than 100,000 internet users the proportion of online poker players is highest for Hungary (1.983%). In detail, one out of 50 Hungarians with internet access plays online poker for real money. Hungary is followed by Estonia (1.981%), Portugal (1.936%), Denmark (1.906%) and the Netherlands (1.612%). For the Germany, it is striking that it is by far the biggest market in absolute terms, but rank only 17th (0.907%) considering the number of internet users in a country. Regarding the size of the world market for online poker we can state that the EU-27 countries are almost three times the size of it. 0.863% (1 out of 115) of all people in the EU-27 countries with internet access have played online poker for real money during the 6 months of the data collection in comparison to 0.307% (1 out of 326) who played on the world market.

Rank	Country	Active players	Internet user	Players/internet user
1	Hungary	122,482	6,176,400	1.983%
2	Estonia	19,212	969,700	1.981%
3	Portugal	100,075	5,168,800	1.936%
4	Denmark	90,532	4,750,500	1.906%
5	Netherlands	239,700	14,872,200	1.612%
6	Finland	71,543	4,480,900	1.597%
7	Cyprus	6,445	433,800	1.486%
8	Slovenia	18,899	1,298,500	1.455%
9	Latvia	20,281	1,503,400	1.349%
10	Sweden	102,333	8,397,900	1.219%
11	Bulgaria	40,876	3,395,000	1.204%
12	Luxembourg	4,754	424,500	1.120%
13	Lithuania	23,555	2,103,471	1.120%
14	France	445,860	44,625,300	0.999%
15	Greece	47,002	4,970,700	0.946%
16	Austria	57,802	6,143,600	0.941%
17	Germany	581,350	64,123,800	0.907%
18	Spain	253,043	29,093,984	0.870%
19	Belgium	68,792	8,113,200	0.848%
20	Romania	64,703	7,786,700	0.831%
21	Ireland	25,107	3,042,600	0.825%
22	Czech Rep.	42,272	6,680,800	0.633%
23	Great Britain	269,247	51,442,100	0.523%
24	Malta	1,146	240,600	0.476%
25	Poland	88,281	22,450,600	0.393%
26	Slovakia	15,129	4,063,600	0.372%
27	Italy	85,504	30,026,400	0.285%

TOTAL EU-27	2,905,925	336,779,055	0.863%
Total World Market	6,029,930	1,965,162,316	0.307%

Table 6: EU-27 countries with the proportion of online poker players per internet users (only countries with more than 100,000 internet users).

Source internet user: Internet World Stats, for June 2010.

Limitations

Although the study yields many findings there are some limitations. First, the OPD-UHH only consists of data on cash games, poker tournaments have not been taken into consideration. According to PokerScout, the revenue of a poker site approximately consists of 70% cash games and 30% poker tournaments. The market size calculations of this study assume that this relation is identical for every operator, which might not be true as the tournaments require a larger player pool and the smaller poker networks probably earn a lesser percentage with them. The OPD-UHH also excludes pure tournament players and, hence, the numbers of poker players in the different countries we derived in this study underestimate the true value. However, it is reasonable that there are just a very few players playing only tournaments and whom we do not have any data on.

Second, the data on the origin is self reported by the players. It is therefore possible that not all players stated their correct country. But as withdrawing funds is only possible if the correct personal data are submitted, we reason that the cases of wrong information are rare.

Third, as PokerStars and Cake Poker do not give information about the country of a player but only of their city. To assign the players to countries we used the city database “World Cities” by Maxmind.¹⁴ In doing so we faced two general challenges: 1) Many city names in the world exist multiple times. 2) The city data base only lists cities having a population of at least 50,000. To solve these issues we developed an algorithm to assign player identities to countries by taking the size of the cities into

¹⁴ For further information about this database see: <http://www.maxmind.com/app/worldcities>.

consideration. In the end, we were able to successfully assign 92% of the poker players stating a city of origin to their country of origin. 8% remained as not assignable.

Finally, we faced the problem that one player can have more than one poker identity by registering at multiple sites. It may also be possible that more than one person use the same player identity (for example family members). Considering different qualitative arguments (see above), we estimate that for 100 poker identities 85-90 real persons exist. We admit this number is not an exact empirical value but an estimation and therefore open to subjective interpretation.

Summary and Perspectives

The online poker market has grown rapidly in the past years. But until now there were only estimates about the total market size and nobody knew how where the players and their money come from, which countries are the biggest markets, and where the proportion of people gambling online on poker games in relation to the population and to the internet users is highest.

This study is able to shed light on the online poker market. It is the first time that the market can be broken down to the EU-27 countries. We identified 2,905,925 active poker players for these countries paying 1.62 billion US\$ rake to the operators in 2010 (558 US\$ per player on average). We also assigned the observed poker identities to their country of origin and derived the market size of the countries: We found Germany to be the biggest poker market of the EU-27 countries with a market size of 392 million US\$ and with 581 thousand players. Even though Germany is the biggest market in absolute terms, Finland is the biggest relative market with 15.40\$ spending per head. The main driver of the relative market size in a EU-27 country is the internet activity. Denmark is the country with the highest proportion (1.641%, 1 out of 61) of online poker player in regard to its population. In relation to the number of internet users Hungary has the highest proportion (1.983%, 1 out of 50) of online poker players.

This study only scratches on the surface of the possibilities the detailed data in the ODP-UHH allow. It is possible not only to break down the market on a national level but also to regions within countries. Future studies will also be able to analyze the playing habits and to determine for example the session lengths and the playing frequency of a player and which limits and how many tables the player plays simultaneously. This information can then be used for further analyses regarding inter and intra country differences. By conducting time series analyses it is also possible to identify how many players tend to play more often and more intensively over time and how many decrease the intensity of play and what kind of factors may give a hint at which group a player belongs to. This may not only be interesting for the industry but also from the viewpoint of excessive and compulsive gambling.

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Measurement Appendix

Sample (n=27)			
Variable	Regression coefficient	t-value	Significance
Constant	-6.208	-2.404	0.024
Internet activity	0.188	4.101	0.000
GDP per capita in 1000 US\$	-0.055	-1.055	0.302
Goodness of fit $R^2=0,445$; adjusted $R^2=0,398$; F-value=9,604 (p=0.000)			

Table 7: Results of a simple linear regression regarding the influence of GDP per capita and internet activity on the spending per head.