European Lotteries' report on lotteries in the EU and in Europe in 2010

Lausanne, Switzerland, June 2011

Table of contents

1. Lotteries in the EU and Europe 2010 - Executive Summary

In 2010, the total economic activity measured as gross gambling revenue (sales minus prizes and hereinafter GGR) of state licensed and controlled lotteries in the EU (27) was € 33.2 bn. Compared to 2009, this was a decrease of 3.0%[1]. This figure reflects the expenditure of European Union (27) consumers on activities offered by the state licensed national lotteries. In the period 2006 to 2010, the average annual increase in total GGR was 0.7%. Viewing all the European Lotteries' 75 members that reported in 2010 (not including RAY, Finland as explained in the footnote for table 1a) , the total GGR was € 35.9 bn; of this, lotteries from Turkey, Switzerland, Norway and Israel account for the majority of the difference.

In the EU, per capita spending ranges from € 2 in Latvia, € 4 in Romania and € 5 in Lithuania to more than € 100 in Cyprus, Greece, Italy, Spain and the Nordic countries. Average spending across the EU was € 66. The corresponding figure for the 74 reporting European lotteries was € 43, including the Russian Interlot and Orglot lotteries covering a population of almost 142 million and spending at € 0.3 per capita.

Sales in the EU, measured for the four "lottery categories", draw based games[2], instant tickets, sports games with pari-mutuel and fixed odds, were € 73.8 bn in 2010 representing a decrease of 2.0% over that of 2009.

A key characteristic of the state licensed lotteries in the EU is that they are required by law or through their license to make payments to society. In 2010, such mandatory payments to society from the 54 reporting EU lotteries came to a total of € 22.2 bn in the form of taxes for treasury, duties, funds for sports or funds for other good causes. This was down 1.3% compared to 2009. On average, a state licensed lottery in the EU gives back to

---

[1] The survey has data from 2006, 2007, 2008, 2009 and 2010. To make figures comparable over time, all lottery monetary figures from those years in currencies other than EUR have been converted into EUR using the 3.1.2011 European Central Bank exchange rates. In other words, all amounts in the report are reported in 2011 EURO value. Thus, looking at previous years reports, which have used exchange rates from 2007, 2008, 2009 and 2010 respectively; differences appear as a consequence of the change in exchange rates.

[2] In previous year's reports "Draw based games" was referred to as "Number games". The name has been amended to correspond better with international terminology but the games included in the category are unchanged cf. Annex A.

society as mandatory payments – as opposed to and not including sponsorships[3] – 67% of each Euro it earns and some even return more than 75% as shown in table 19. In the largest EU member states the amount for society raised from lotteries exceeded € 2.0 bn (Italy € 5.8 bn, Spain € 4.0 bn, Germany € 2.7 bn, France € 2.5 bn, the U.K € 2.6 bn). On average, the amount that lotteries paid back to society across the 27 EU member states (population of 501 million) was € 44 per capita in 2010.

The largest lottery activity in the EU is comprised of draw based games with brand names like Lotto, EuroMillions and Joker. This category of game, offered in all 27 EU member states, had sales of € 49.3 bn and a GGR of € 22.5 bn and accounted for 68% of total GGR. The category dropped 5.7% from 2009 and seen over the period 2006 to 2010, it has lost an average of 2.1% every year.

The second largest category is instant games with EU sales of € 17.3 bn and a GGR of € 5.7 bn representing some 17% of the total GGR. The category's GGR remained quite steady, decrease 0.8% over 2009. On the top three instant selling countries there were increases in France and the U.K. but decrease in Italy.

National lotteries in 26 of the 27 EU member states (all except Greece) offer instant games and per capita spending ranges from € 2 or less in, for example, Estonia, Germany, Latvia, Lithuania, Malta, Poland, Spain and the Czech Republic to more than € 20 in Cyprus, France, Italy and Sweden. Italy is the largest market with € 2.8 bn in GGR, but it lost 4.8% compared to 2009.

The two sports games categories, pari-mutual and fixed odds wagering, totalled a GGR in the EU of € 2.0 bn (6% of the total GGR). However, sports wagering pari-mutual continued its strong decline and GGR dropped 7.4% from 2009. The average annual decrease since 2006 has been 11.7% for this category to now totalling € 658 million. Fixed odds betting saw an increase of 3.7% compared to 2009 and showed a total GGR of € 1.4 bn in 2010, a World Cup tournament soccer year. National lotteries in 17 EU member states offered fixed odds betting in 2010.

[3] In 2010, some 29 lotteries in the EU reported a total of € 198 million in sponsorships. Among all the EL members, some 35 lotteries reported total sponsorships of € 225 million.

Slot machines, apart from casinos, are operated by lotteries in 6 EU member states. This was the third largest category with a GGR of € 2.2 bn (7% of the total GGR); and a growth of some 18% over 2009.

Direct full time employment by 53 EU lotteries in 2010 was above 19,000 whilst indirect employment typically in sectors selling lottery products accounted for more than 290,000 full time jobs[4].

Responsible gaming and measures to prevent problem gambling are an integrated part of lottery operations. In 2010, some 29 lotteries reported spending of € 21 million on measures to prevent problem gambling. Among all the EL members, the corresponding figures were 34 lotteries spending € 26 million.

Some 25 state licensed lotteries in 20 EU member states reported a total GGR through the Internet of € 1.7 bn; a growth of 20% over 2009. The annual growth of GGR through the Internet has averaged 38% over the past three years.

2. Introduction and background

This is the fifth report based on data gathered under the heading "ELISE"[5]. The report covers key descriptive statistics about lotteries in Europe in 2010 and includes comparative statistics for the years 2006 – 2009 where appropriate. All monetary figures also from previous years 2006 to 2009, are calculated in EUR using the exchange rate from the Central European bank 3.1.2011, as noted in the above foot note 1. This implies slight differences in, for example, 2009 figures in this report and the same 2009 figures in last year's report.

---

[4] The calculation is based on the London Economics study "The case for State lotteries", September 2006, which found a multiplier effect of 15. In other words, for each full time employee of the lotteries an average of 15 full time jobs was created in sectors where lotteries are sold.

[5] European Lotteries Information Sharing Extended. Data are collected through a questionnaire to all EU lotteries and since 2008 also to non EU lotteries which are members of EL, and quality tested by a group of lottery experts. The group is chaired by Mr. Léon Losch, EL Executive Committee member and CEO of the Loterie Nationale, Luxembourg, and the members are: Ms. Alexandra Perrier, Head of International Relations of La Française des Jeux, France; Ms. Helka Lääperi, Development Manager/BI, Veikkaus Oy, Finland; Mr. Oscar Castro Villar, Business Analyst of ONCE, Spain; Mr. Ulrich Engelsberg, Senior Referent, Westdeutsche Lotterie GmbH & Co. OHG, Germany; Mr. Wolfgang Leitner, Senior Controller and Ms. Astrid Baier-Löw, Financial Controller, Austrian Lotteries, Austria,; Mr. David J. Evans, Global Strategy and Insight Manager at Camelot UK Lotteries Ltd., U.K.; Mr. Jean Moreau Jørgensen, Executive Director, World Lottery Association, Denmark; Ms Mélissa Jacquérioz Steiner, Administrative Secretary, and Ms. Bernadette Lobjois, Secretary General of EL, Lausanne, Switzerland.

The objective being to provide data on the economic activities of lotteries in the European Union member states (EU 27) and in Europe in general.

The EL gathered the information for this report in spring of 2011. It is the most detailed and up to date data on lotteries in the EU and Europe available from any source. The survey for 2010 has data from 76 EL member lotteries (including RAY, the Finland's Slot Machine Association) and covers 42 European countries. As all EL members have answered the survey, the response rate is 100%.

There are five common characteristics of the EU lotteries included in this report. They:

1. are located in an EU country
2. have an exclusive license from the state (or region) to operate games and are controlled by the state
3. make mandatory payments to the state and/or to state defined good causes like, for example, sports or culture
4. sell only within the jurisdiction they are licensed and cover the complete jurisdiction. They are not "local" lotteries and unlike commercial bookmakers, they do not sell in a jurisdiction where they are not licensed
5. are members of the EL

Thus, the reporting lotteries of each country serve as the "base unit". With a few exceptions, they cover all large-scale lotteries in the EU. Not all lotteries offer the same games and services. Therefore, each table is calculated with the number of lotteries that reported for the activity indicated in the table heading.

The report shows the consolidated Gross Gaming Revenues (GGR) figures broken down into six gaming categories[6] and the corresponding sales figures. It also shows the amount of money collected through mandatory payments by lotteries to society, the employment created through lottery activities and how the Internet is used as a sales channel for lottery products. The tables are accompanied with explanatory footnotes where appropriate but otherwise left uncommented to serve as a basis for EL members and other stakeholders' own analysis.

[6] The six categories are defined in Annex A.

The EL believes that ELISE can contribute to the understanding of how lotteries work and what their contributions are to society in general.

Bernadette Lobjois, EL Secretary General, Lausanne, Switzerland, June 2011

3. Tables and figures

Table 1a: Participating lotteries in the EU

Country	Number of reporting lotteries	Founded year	EU lotteries
Austria	1	1986	Österrechische Lotterien
Belgium	1	1934	Loterie Nationale
Bulgaria	2	1957	Bulgarian Sports Totalizator
		1993	Eurofootball Ltd.
Czech Republic	1	1956	Sazka a.s.
Cyprus	2	1958	Cyprus Government Lottery
		1969	OPAP (Cyprus) Ltd.
Denmark	2	1948	Danske Spil AS
		1753	Det Danske Klasselotteri AS
Estonia	2	1971	AS Eesti Loto
		2003	AS Spordiennustus
Finland*	2	1940	Veikkaus Oy
		1938	RAY Raha-automaattiyhdistys*
France	1	1933	La Française des Jeux
Germany	18	1946	Staatliche Lotterieverwaltung
		1947	Süddeutsche Klassenlotterie (SKL)
		1947	Deutsche Klassenlotterie Berlin (DKBL)
		1948	Staatliche Toto-Lotto GmbH
		1948	Nordwestdeutsche Klassenlotterie (NKL)
		1948	Bremer Toto und Lotto GmbH
		1948	Lotto Rheinland-Pfalz GmbH
		1948	LOTTO Hamburg GmbH
		1949	Lotterie-Treuhandgesellschaft mbH Hessen
		1949	Toto-Lotto Niedersachsen GmbH
		1951	Saarland-Sporttoto GmbH
		1957	Westdeutsche Lotterie GmbH & Co. OHG
		1990	Sächsische LOTTO- GmbH
		1991	Land Brandenburg LOTTO GmbH
		1991	Verwaltungsgesellschaft Lotto und Toto in Mecklenburg-Vorpommern mbH
		1991	Lotto-Toto GmbH Sachsen-Anhalt
		1991	Nordwestlotto Schleswig-Holstein GmbH & Co. KG
		1991	Lotterie- Treuhand-Gesellschaft mbH Thüringen
Greece	2	1959	OPAP S.A.
		1929	Hellenic State Lotteries
Hungary	1	1991	Szerencsejáték Zrt.
Ireland	1	1987	An Post National Lottery Company
Italy	2	1990	Lottomatica S.p.A.
		1946	Sisal S.p.A.
Latvia	1	1993	Latvijas Loto
Lithuania	1	1993	Olifeja Inc.
Luxembourg	1	1945	Loterie Nationale
Malta	1	2004	Maltco Lotteries Ltd
The Netherlands	2	1959	De Lotto
		1726	Nederlandse Staatsloterij
Poland	1	1956	Totalizator Sportowy Sp.z.o.o.
Portugal	1	1783	Santa casa da Misericórdia de Lisboa
Romania	1	1906	Compania Nationala Loteria Romana S.A.
Slovakia	1	1993	TIPOS, národná lotériová spoloènoist, a.s.
Slovenia	2	1952	Loterija Slovenije d.d.
		1996	Sportna Loterija d.d.
Spain	3	1812	Loterías y Apuestas del Estado
		1987	Loteria de Catalunya
		1938	Organización Nacional de Ciegos Españoles (ONCE)
Sweden	1	1996	AB Svenska Spel
United Kingdom	1	1994	Camelot UK Lotteries Ltd.
EU (27) TOTAL*	**54**		

**RAY is the Finnish Slot Machine Association and a member of EL. As such, RAY completed the ELISE survey. However, RAY does not offer lottery games and their data has not been included in the aggregated lottery data shown in this report.*

Table 1b: Participating lotteries outside the EU

Country	Number of reporting lotteries	Founded year	EL lotteries outside the EU
Azerbaijan	1	2001	Azerlotereya SJSC
Belarus	1	2007	CJSC Sport-Pari
Bosnia and Herzegovina	2	1973	Lutrija BIH
		1992	Lottery of the Republic of Srpska
Croatia	1	1973	Hrvatska Lutrija d.o.o.
Georgia	1	2009	GLC Georgian Lottery Company LLC
Iceland	2	1934	Happdrætti Háskóla Íslands
		1986	Íslensk Getspá
Israel	2	1968	Israel Sports Betting Board - ISBB
		1951	Mifal Hapais
Kosovo	1	1974	Lotaria e Kosovës
Moldova	1	1994	I.M. Loteria Moldovei SA
Norway	1	1948	Norsk Tipping AS
Russia	2	1996	CJSC Interlot
		2006	Orglot OOO
Serbia	1	2004	State Lottery of Serbia d.o.o.
Switzerland	2	2003	Swisslos
		1937	Société de la Loterie de la Suisse romande
Turkey	1	1939	Milli Piyango Idaresi Genel Müdürlügü
Ukraine	2	1971	MSL
		1997	Ukrainian National Lottery
EL (42) TOTAL	21		

Thus, a total of 76 lotteries have provided 2010 data for this report.

Table 2: GGR 2010 in the EU by game category

Game category	Lotteries reporting	EU (27) GGR 2010 (M€)	%
Draw based games	52	22'516	68%
Instant games	44	5'675	17%
Sports games pari-mutual	33	658	2%
Sports games fixed odds*	31	1'398	4%
Slots/VLTs/EILs outside casinos	7	2'163	7%
All other games and non gaming activities	13	749	2%
Total	**53**	**33'160**	**100%**

Euro exchange rate 3.1.2011. All the data from previous years has been recalculated from the national currencies using these rates.

GGR = Gross Gambling Revenue

**Not including Bulgaria Eurofootball, they did not report GGR*

Figure 1: GGR 2010 in the EU by game category

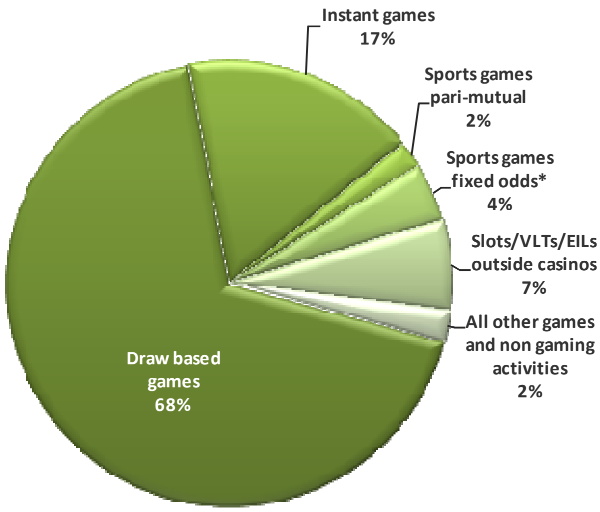

Table 3: GGR 2010 for EL members by game category

Game category	Lotteries reporting	EL (41) GGR 2010 (M€)	%
Draw based games	71	24'271	68%
Instant games	60	6'069	17%
Sports games pari-mutual	41	742	2%
Sports games fixed odds*	40	1'604	4%
Slots/VLTs/EILs outside casinos	14	2'387	7%
All other games and non gaming activities	17	772	2%
Total	**74**	**35'846**	**100%**

Euro exchange rate 3.1.2011. All the data from previous years has been recalculated from the national currencies using these rates.

GGR = Gross Gambling Revenue

**Not including Bulgaria Eurofootball, they did not report GGR*

Table 4: Lottery sales 2010 in the EU by game category

Game category	Lotteries reporting	SALES EU (27) 2010 (M€)	%
Draw based games	52	49'270	67%
Instant games	44	17'252	23%
Sports games pari-mutual	33	1'694	2%
Sports games fixed odds	32	5'566	8%
Total	**54**	**73'783**	**100%**

Euro exchange rate 3.1.2011

Figure 2: Lottery sales 2010 in the EU by game category

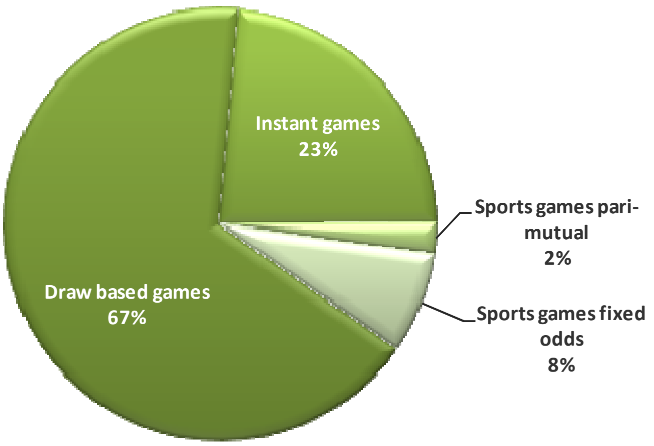

Table 5: Lottery sales 2010 for EL members by game category

Game category	Lotteries reporting	SALES EL (41) 2010 (M€)	%
Draw based games	71	52'733	67%
Instant games	60	18'096	23%
Sports games pari-mutual	41	1'898	2%
Sports games fixed odds	41	6'159	8%
Total	**75**	**78'885**	**100%**

Euro exchange rate 3.1.2011

Table 6: GGR development in the EU 2006 – 2010 by game category

Game category	Lotteries reporting	EU (27) GGR 2010 (M€)	EU (27) GGR 2009 (M€)	Change (%) 2010 vs. 2009	EU (27) GGR 2008 (M€)	EU (27) GGR 2007 (M€)	EU (27) GGR 2006 (M€)	Avg. annual change (%) 2010-2006
Draw based games	52	22'516	23'881	-5.7%	22'880	24'916	24'558	-2.1%
Instant games	44	5'675	5'720	-0.8%	5'698	5'627	4'350	6.9%
Sports games pari-mutual	33	658	711	-7.4%	801	997	1'084	-11.7%
Sports games fixed odds*	31	1'398	1'348	3.7%	1'454	1'231	1'264	2.6%
Slots/VLTs/EILs outside casinos	7	2'163	1'833	18.0%	1'664	1'197	754	30.2%
All other games and non gaming**	13	749	687	9.1%	376	278	237	33.4%
Total	**53**	**33'160**	**34'180**	**-3.0%**	**32'873**	**34'245**	**32'246**	**0.7%**

Euro exchange rate 3.1.2011

GGR = Gross Gambling Revenue

**Not including Bulgaria Eurofootball, they are not reporting GGR*

***Interactive games included in this sector 2006 report*

Table 7: Sales development in the EU 2007- 2010 by game category

Game category	Lotteries reporting	SALES EU (27) 2010 (M€)	SALES EU (27) 2009 (M€)	SALES EU (27) 2008 (M€)	SALES EU (27) 2007 (M€)	Change (M€) 2010 vs. 2009	Change (%) 2010 vs. 2009
Draw based games	52	49'270	51'560	49'883	53'645	-2'290	-4.4 %
Instant games	44	17'252	16'735	16'151	14'678	517	3.1 %
Sports games pari-mutual	33	1'694	1'882	2'003	2'325	-188	-10.0 %
Sports games fixed odds	32	5'566	5'136	5'392	4'116	430	8.4 %
Total	**54**	**73'783**	**75'314**	**73'429**	**74'764**	**-1'531**	**-2.0 %**

Euro exchange rate 3.1.2011

Annex A: Data collection and game category definitions

The data was gathered and analyzed in the period from March to May 2011 and covers the calendar year 2010. With few editorial changes in the questionnaire that lotteries complete, the same data has been collected in previous years 2006 to 2009 allowing for comparison over time. Data was requested in national currency and figures from the non-Euro countries was converted into Euros using the European Central Bank's official exchange rate quoting on January 3, 2011. Population figures are from EUROSTAT. Percentage changes between years have been calculated on the basis of figures in national currency.

The report relies almost exclusively on primary data sources. All data thus comes from EL member lotteries answering to a questionnaire sent out on 2nd February 2011 by the EL.

There are no common definitions or internationally agreed to terms for games operated by state lotteries – or for that matter the wider gaming markets. Each jurisdiction thus applies its own definitions and no EU framework exists to give a homogenous description of gaming categories. The SICL study used five categories[7] of which lotteries were one (the others were bingo; casino; sports betting and slot machines outside casinos). There is a great variety of activities offered by lotteries. Svenska Spel, for example, operates games in all of the categories used in the SICL study. In the Nordic region, national lotteries were established in the 1930's and 1940's offering "Tipset". It was a sports game based on the outcome of typically 11 to 13 football matches. The lotteries later added other games based on a random draw of numbers – typically named Lotto. The national lottery in Denmark, Danske Spil AS, also operates horserace betting whilst other jurisdictions have granted separate non-lottery entities, like PMU in France or ATG of Sweden, exclusive licenses for this activity. In the U.K., nation wide lotteries were prohibited until The National Lottery was established in 1994.

In spite of the lack of a commonly agreed to framework, for the description of gaming, there is an unspoken consensus in the world of gaming by which games can be meaningfully grouped under the same heading. Commonly understood terms have developed over time and are based upon a few generic gaming characteristics.

Probably the most important distinction, as explained below, is between pari-mutual based games and games with fixed odds.

Additionally, there is usually a distinction between games where the outcome is completely based on a random selection of numbers or symbols and games where the outcome is based on one or more events, in which it is meaningful to claim that punters can estimate the likelihood of the outcomes differently. In other words, games based on future events in areas like sports, politics, music, film, weather forecast etc. where a punter's skill or knowledge within the given area increases her/his chances of winning the game.

The first group of games, those of random outcome, are typically also divided into regularly drawn games and pre-drawn games. The former is, for example, Lotto whilst the latter could be a scratch

[7] The study originally had eight categories defined by the EU Commission in its tender document Markt/2004/12/E. However, the researchers were only able to collect data from five out of eight categories leaving out Gambling services operated by charitable organisations; Media gambling services and Sales promotional games with prizes above € 100.000.

ticket game, where the winning tickets were determined at the time of printing.

Building upon this unspoken consensus, a list of terms with accompanying explanations was given to the lotteries to assist them in answering the data questionnaire. The explanations are attached as annex b and show which data the participants have been asked to report.

The report defined 6 economic activities carried out by lotteries:

Draw based games: All games offered nationwide and based on a random draw of numbers, letters or symbols. Another term would be Number games used in earlier versions of the questionnaire. The most well known European (worldwide) generic brand names are Lotto, Keno, Joker, Class Lottery and Bingo. The games are normally built on the pari-mutual principle where a certain percentage of the total stake sum is allocated to one or more prize pools and then shared amongst the winners in that prize pool. If there are many winners the prizes will be small and vice versa.

However, a small number of the games in this category use fixed prizes. In other words, the player knows the potential winning on a lottery ticket at the time of purchase no matter how many winners there are. There is thus a certain risk for the lottery operator that it must pay out more in prizes that what it sells for. This is obviously never the case for pari-mutual based games. When fixed prize games like, for example, Bingo or Keno are sold in large volumes the prize pay-out resembles that of pari-mutual games which is why they are grouped together.

In economic terms, the “Draw based games” category is by far the largest of all lottery operated game categories. Note that a given game may be sold through more sales channels like retail, the Internet and mobile phones.

Instant games: “scratch tickets” or “pull tab” games are pre-drawn lotteries. In other words, when the player buys a ticket it has already been decided at the time of manufacturing and according to a winning plan if the ticket is a winner or not. Thus, the player can immediately see if it is a winning ticket and hence the name “instant ticket”.

Typically, the winning plan applies a certain percentage of a sales unit as the prize amount and the winner selection is exclusively random. Thus, in construction, the game is closely related to number games in particular if the volume sold is large. However, the category always uses fixed prizes where players know the potential size of a winning in advance of the purchase independently of the conduct of other players.

Sports games pari-mutual: The term “sports betting” or “sports games” does not necessarily refer only to betting on sports events. In some jurisdictions, “sports betting” may also cover betting on other future events from politics, music, films, weather forecast or even operator created events – what in the U.K. comes under the term “novelty bets”. This report will therefore also use the term “sports games” knowing that it embraces events other than sports.

Probably the most important distinction in sports wagering is between pari-mutual betting and fixed odds betting. In Pari-mutual betting the lottery defines a certain share of the stake that goes to one or more prize pools. As stated above, if many punters predict the correct outcome, prizes will be small and if only few have guessed the correct outcome prizes will be large. Thus, the operator runs no risk of loosing money – given a level of sales that at least cover the total costs. The principle is typical for wagering on horse races and for the so-called “Toto” or “Tipset” games where punters must predict the outcome of a series of football matches ranging from 11 to 14 in the 1 (home win) X (draw) or 2 (away win) format.

Sports games fixed odds: Fixed odds betting is different. Here, the price or “the odds” are set in accordance with the different likelihoods of the outcome of a given event[8]. Hence, the operator offers a fixed prize established as the stake multiplied by the odds for a correct prediction. In principle, the operator does not need any volume as would be the case in pari-mutual wagering. The wager is, of course, concluded before the outcome of the event is known and the potential prize is then fixed and cannot subsequently be altered. Obviously, the operator runs a risk that the prize payout might exceed sales, which is not the case for pari-mutual based games.

Slots/VLTs/EILs outside casinos: Slot machines, Video Lottery Terminals (VLTs) and Electronic Instant Lotteries (EILs) are devices designed for gaming which the player operates without the intervention of a sales person or retailer. Typically, VLT’s are modern devices linked to a central computer from which games can be monitored, audited, installed and removed on one or on more terminals at a time. Slot machines are normally stand-alone devices where new games may be installed but only through direct physical contact which each machine.

Any other game or non-gaming activities: Was created as a residual category to make sure all games and economical activities offered were included in the answers. The category comprises of Internet Poker, Brick and mortar casino games and non-gaming activities like the issuing of drivers licenses.

[8] The odds are equal to: prize pay-out percent divided by the likelihood of the outcome in percent. For example, a lottery aims at an average theoretical pay-out of 85% of sales and uses this as the pay-out percentage for individual betting objects. Let the event be a football match between Manchester United and Arsenal where the company’s experts estimate that the likelihood for a home win is 50%, a draw 35% and an away win 15%. The (rounded) odds, or the price offered to punters for betting with one unit on the correct outcome, would then be: 85%/50% = 1.70 for (1); 85%/35% = 2.45 for an (x) and 85%/15% = 5.65 for the (2).