



Università
Ca' Foscari
Venezia

Corso di Laurea Magistrale
in Economia e Gestione delle Aziende -
curriculum International Management

Tesi di Laurea

Business of Gambling: impact on Italian economy, policies and regulation of the phenomenon

Relatore

Ch. Prof. Michele Bernasconi

Laureando

Denis Sabbadin

Matricola 842162

Anno Accademico

2016 / 2017

Index

Introduction	4
1. History and evolution of gambling.....	7
1.1. Origin of gambling	7
1.2. Evolution of games in the last two centuries	9
1.3. Types of games	11
2. Analysis of the business	15
2.1. Casinos.....	17
2.2. Lotteries	20
2.3. Betting	22
2.4. Slot Machines	24
2.5. The new frontier of gambling: Online Games.....	27
3. Social analysis of the phenomenon	33
3.1. Profiles of players.....	33
3.2. Geography of gamblers.....	35
3.3. Technological revolution and game addiction	41
4. Customer's choices in uncertain scenario: the expected utility	45
4.1. Expected Utility theory	46
4.2. Risk avoidant and risk seeking	50
4.3. Risk, insurances and lotteries.....	54
4.4. The St. Petersburg Paradox.....	56
4.5. Gambler's Fallacy	59
5. Taxes and fees: the impact of gambling on Italian tax revenue	62
5.1. Historical trend of Italian gambling business	63
5.1.1. Until 2004	64

5.1.2.	2004-2011 Period	65
5.1.3.	2011-2016 Period	67
5.2.	Types of taxes.....	68
5.3.	Current tax framework.....	72
5.4.	Analysis of taxation in the period 2012-2016	75
5.5.	Possible developments	87
5.6.	Elasticity and Gross Margin taxation.....	90
6.	Government position: policies and regulation of gambling in Italy	95
6.1.	History of game taxation.....	95
6.2.	Regulations of gambling before Decreto Bersani (until 2006).....	97
6.3.	Decreto Bersani and renovation of taxation.....	101
6.4.	Evolution of regulation and taxes after Decreto Bersani.....	105
6.4.1.	Decreto Balduzzi and customer protection	106
6.4.2.	PREU and Slot taxation.....	110
6.4.3.	Stability Law of 2015 and 2016	112
6.5.	European Community orientations.....	113
Conclusions.....		117
Bibliography.....		120

Introduction

Over the last 20 years, interest in gamblers' behavior and in the socio-economic impact of legal gambling has increased enormously. Plenty of researchers in different countries have dedicated increasing attention to gambling issues, given the quick growth of the industry. Most of them were focused on gaming addiction and on the behavior of pathological gamblers from psychological and sociological points of view. Nevertheless only a relatively small share of researches on gambling has been dedicated to managerial and economic themes. All of this seems almost paradoxical, given that the main reasons why casinos and gambling in general have been created are economic in nature. Italy is one of the countries whereby gambling is most spread nowadays, and it's even the most addicted to slot machines. Since the first liberalization in 2003, gambling industry in Italy has followed a dynamic and exponential growth, in contrast with the stagnation observed in all the other economic sectors. We need only to think for example that almost 30 million of Italians played lotteries, betting or slot machines at least once in 2016, "investing" a total amount of 96 billion of Euro, accounting for a net expenditure of 19 billion. Crisis of 2008 has increased a lot the amount of money played on gambling: inclination to games is in fact much higher within less wealthy and educated classes, making gambling a real anti-redistributive tax.

The purpose of this thesis is to document the socio-economic dimension that gambling has taken on in Italy, by offering an analysis of the impact of this phenomenon on the Italian economy, with a specific focus on taxation. Given that the

gambling regulating agency (AAMS) makes available on its website¹ a great amount of detailed and updated data, this research has been mostly based on the analysis of them. The first part is aimed to introduce the concept of gambling, since its first appearances in history, passing through its evolution over centuries, until a description of the various kinds of games that now constitute the Italian gambling system. The study will then move towards an analysis of the market situations of the most representative gambling categories in Italy, which correspond to casinos, lotteries, betting, gaming machines and online games. The third chapter is dedicated to the investigation of the sociological aspects of gambling: starting from the various types of gamblers, we are going to define who is the average Italian gambler, by studying the distribution of the phenomenon in the whole country and by explaining how technological innovation has influenced people's approach to gambling. It follows then a technical enlightenment about how people take decisions in conditions of risk: at this purpose the Expected utility theory by von Neumann will be introduced, together with its implications in case of risk; after having given a sight over a milestone of the decisions in uncertain scenarios (the Saint Petersburg's paradox) the main gambler's mistakes and fallacies will be explained. What is expressed in the first chapters lay the foundations for facing and understanding better the real core of this paper: gambling taxation in Italy, that is the theme of the last part of the thesis. In particular we are going to take a look at the taxation trend of gambling industry over the last 25 years, with a special focus on the most recent period; the current tax framework will be then explained, recovering the concepts of ad valorem tax and specific tax and their effects combined with elasticity of the demands. To conclude I will run through the history of gambling regulation and

¹ <https://www.agenziadoganemonopoli.gov.it/portale/monopoli/giochi>

legislation over the last decades, listing and explaining the renovations of the various decrees year over year, witness of a clearly ambiguous position of government about the issue, given that gambling still represents an important source of revenues for the State but also a real plague for a huge number of people.

1. History and evolution of gambling

1.1. Origin of gambling

It's acknowledged by everyone that gambling is widespread all around the world and every time we hear the single words "*Gambling*" or "*Hazard*" we automatically think about huge casinos in Las Vegas, Singapore or Macau (China). But actually this concept of game is not recent at all, and it finds its roots in the ancient civilizations of Western Asia. Not by chance the term "*Hazard*" derives from the Arabic word "*Zahr*" that means "dice". There are plenty of witnesses of gambling in almost every era. For instance, during the Babylonian age people used to play with animal bones, rolled like a kind of dice-prototype. There are then tracks of gambling in Egyptian, Greek, Roman and Chinese societies. Game and hazard seem to integrate each other forever; "*alea*" was the term the ancient Romans used for indicating dices game, and consequently the term "*aleatory*" now defines everything is handled by chance¹.

"Alea signifies and reveal the favor of destiny. The player is entirely passive; he doesn't deploy his resources, skills, muscles, or intelligence. All he need do is await, in hope and trembling, the cast of the die. He risks his stake. (...) Alea negates work, patience, experience and qualifications." (Caillois, 1958)

In the ancient Rome gambling fascinated both poor and wealthy people, and it seems that even Emperors Nerone, Claudio and Caligola were great gamblers. But game was also source of controversies and there were various trials of legislation on the issue: one of those laws, Lex Aleatoria, banned lots of the most popular games to

¹ Source: W. Eadington; J. Cornelius - *The business of gamin : economic and management issues*; (1999)

protect citizens against gambling risks and to contain the numerous problems which it originated. In the meantime lotteries were already exploited as mean of funding for the Chinese Empire. Lottery in fact contributed to the consolidation of Han dynasty (206 b.C-220a.C), by financing the conquer war and the edification of the famous enormous Chinese wall.

Until the Middle Age gambling was considered just as another way of entertainment but, after the empowerment of the Papal States in Europe, it started to be seen under a negative point of view. In those years in fact, it was one of the most used ways to swindle other people. It was blamed for being source of sins and of frauds and it was consequently hindered through rules and regulations issued by the Papal State and spread around Europe. In the XIV century cards games started to spread, despite the various Pope's convictions: Lottery was in fact the only gamble allowed at that time, just because it was organized by governments and it constituted a sure revenue for clergy and states. Lotto was born in Genova and it became soon the most practiced game in Italy starting from the XVI century; in 1638 the first state-handed game-house opened in Venice (known as "*Ridotto di Venezia*"). These houses increased in number, becoming 136 at the dawn of 1800².

The first official regulation about the issue dates back to the Napoleonic age, when it was established that gambling was allowed only in specific places destined to this purpose, named "casinos". These structures spread all around Europe: the success of *Ridotto* determined the consequent opening of new casinos in other European cities such as Montecarlo in 1861 and Sanremo in 1906, and hazard started becoming one of the most controversial social issue also in paintings (i.e. "*Card players*" by Paul

² Source: N. Toffa - *Quando il gioco si fa duro : dalle slot machine alle lotterie di Stato*; (2014)

Cèzanne) and romances (such as *"Around the world in 80 days"* by Jules Verne and *"The Player"* by Dostoevskij).

1.2. Evolution of games in the last two centuries

Since the second industrial revolution, gambling started an unstoppable growing trend, implying a multiplication of the available games and a consequent growth of players and money invested in the industry. Gambling began to represent a real big business when casinos started to be attended also by less wealthy classes. It was in fact considered both as an entertainment for nobles and as way to challenge the fate for poorer people, in order to increase their living condition and their status. People were in a continuous risk situation at that time and they were always looking for an opportunity to improve their revenues.

In USA gambling was practiced in Saloons which opened also in big commercial centers such as New Orleans and San Francisco, but in 1919 the XVIII amendment approved prohibition of alcohol and gambling. Gambling became inevitably illegal and managed by organized crime. After the failure of prohibition, gambling was declared legal again in 1931 in Nevada: this event triggered the birth of numerous casinos in Las Vegas, entailing the flourish of the city since the second half of the XX century³.

In 1906 H. S. Mills produced the first slot machines on a global scale, making the fortune of every casino. Their easiness and rapidity of use, made the world of gaming easier and easier to access.

³ Source: Leighton V. Williams, Donald S. Siegel - *The Oxford Handbook of the Economics of Gambling*; (2013)

In the 90's, thanks to the development of the internet for commercial purpose and to the exponentially increasing use of computers, the first gambling websites appeared. The offer of games and services has become wider over years, implying a consequent rise of the demand. In addition to this phenomenon, the diffusion of mobile devices (such as tablet, laptops and smartphones) has boosted further the expansion of gambling, allowing everybody to play outside their houses.

The first game of chance acknowledged at a national level in Italy was Lotto in 1863, despite it was already widespread in the whole country, and the State intervention had the only function of regulating it under a legal point of view. A first significant widening of the offer was applied in the half of the XX century, with the institution of the first games linked to sports events such as football, car races and horse races (such as Totocalcio, in 1946, Totip in 1948 and Tris in 1958). Forty years later gambling sector lived a second phase of renovation, started in the middle of 90s. In that period the supply of games was extended; in 1994 the first instantaneous lotteries were launched and in 1997 there was the transformation of the game "Enalotto" in Superenalotto. The most relevant innovation has been for sure the introduction of fixed rate betting in 1998, allowing the possibility to bet on various event not connected one another. Finally, the dawn of the new millennium has signed the birth of legalized Bingo and the legalization, in 2004, of Slot Machines. The success of these devices has made sure that today they account for half of sources of revenues of the whole sector.

1.3. Types of games

The business of gambling in Italy is regulated by an important state agency named AAMS (in Italian stays for *Amministrazione Autonoma dei Monopoli di Stato*), branch of the Ministry of Economy and Finance since 2007. AAMS distinguishes the games supply in 8 homogeneous categories according to: type of demand covered, development strategy, supply chain structure⁴.

1. Numerical games at fixed rate:

Includes all games based on drawing of numbers with a previously known jackpot; that's because wins are determined by multiplying the stake by a given coefficient, which is inversely proportional to the probability of the event. Lotto is the most famous example of this type of games.

2. Numerical games with national totaliser

They are quite similar to the previous one. Numerical games with national totaliser are games of chance based on the choice of numbers by consumers at the time of the bet. The main difference between them and fixed rate games is that players don't know the amount of wins at the time of bet, because it depends on the whole amount of bets placed and on the number of winners. A share of the stakes is conferred to a single national prize, which is allocated, by regulation, in units of equal value as a function of the number of winning bets belonging to the same

⁴Source: www.agenziadoganemonopoli.gov.it/portale/monopoli/giochi

category of prizes . Leaders of this games are Superenalotto and the younger Win For Life (born in 2009).

3. Gaming machines

Legal since 2002, in these kind of games, players interact with an electro-mechanic (or electronic) device which automatically distributes money prizes in case of win. These are the most spread games and also the most addictive. This category includes Slot machines and Videolottery (VLT).

4. Lotteries

Traditional lotteries are one of the most played categories, related to folk traditions. In their original version they consist in the drawing of numbers and the amount of the jackpot is known at the time of the bet. Unlike numerical games at fixed rate, players are not supposed to have an active behavior, in fact they participate to the lottery simply by purchasing the ticket. Regulation distinguishes between *delayed drawing lottery* (when the winning ticket is determined after a real established drawing) and *immediate drawing lottery*, when it's not necessary waiting for a drawing to know if you win or lose (it just needs to remove the silver film of the ticket, such as in *Gratta e Vinci*).

5. Sports betting

Includes games based on forecasting of the result of a sport event or a combination of them. There may be many events for a single match. It includes also the residual category of other events (such as shows, sing or beauty contests, ecc.) with similar features to races and competitions. Two types of sports betting are allowed in Italy: with national totaliser (such as *Totocalcio* and *Totogol*) and with fixed rate. In those with fixed rate, winners get a prize equal to the amount paid multiplied by the odd of the events played.

6. Horse racing betting

It consists of bets on forecasting about horse races and the prize depends on the ability to guess the right results and on the amount of players, given that this is a totaliser concourse. In this segment there are two categories: horse racing bets and national horse racing.

7. Bingo

Bingo was introduced in Italy in 2001; also for this game is not possible to determine the jackpot in advance, because it depends on how many charts are used and how many of them are winning. It is played in special rooms, equipped with hospitality and entertainment services, favoring encounter and socialization among players.

8. Remote skill games

This new frontier of gaming has emerged after the various technological progresses in informatics and telecommunication that have introduced significant revolutions in the entertainment sector. In 2008 the segment of remote skill games has been introduced in Italy. It allows customers to play using the Internet connection everywhere; it's no more necessary to go to game rooms or casinos to play. The expression *skill games* indicates games in which the probability to win depends both on luck and player's ability. The Italian legislator defines skill games as mostly characterized by player's ability rather than by luck. These games can be played exclusively on specific websites controlled by dealers of Monopolies which allow to bet real money legally.

2. Analysis of the business

Legal Gambling has doubled its size in Italy from 2008 to now and it is still increasing. In 2016 there has been a +7% on the total gross revenues, accounting for about € 95 billion. This is absolutely a huge number because it is worth for 4,4% of the Italian Gross Domestic Product¹. It means that an average of € 260 million per day are spent in gambling. It has been computed that Italian gambling accounts for the 22% of the € 420 billion of the global gambling turnover². This legal business (the illegal gambling is estimated to account for other € 100 billion) guarantees € 10 billion of tax revenue for the Italian state and feeds a supply chain of 6.000 firms and companies with more than 140.000 workers. AAMS is responsible for the regulation, address, coordination and control of the entire public gambling sector. The Italian legislation contemplates a concession scheme characterized by a double constraint for the practice of gambling. The two bonds are:

- The release of the administrative concession by AAMS;
- The public security authorization³

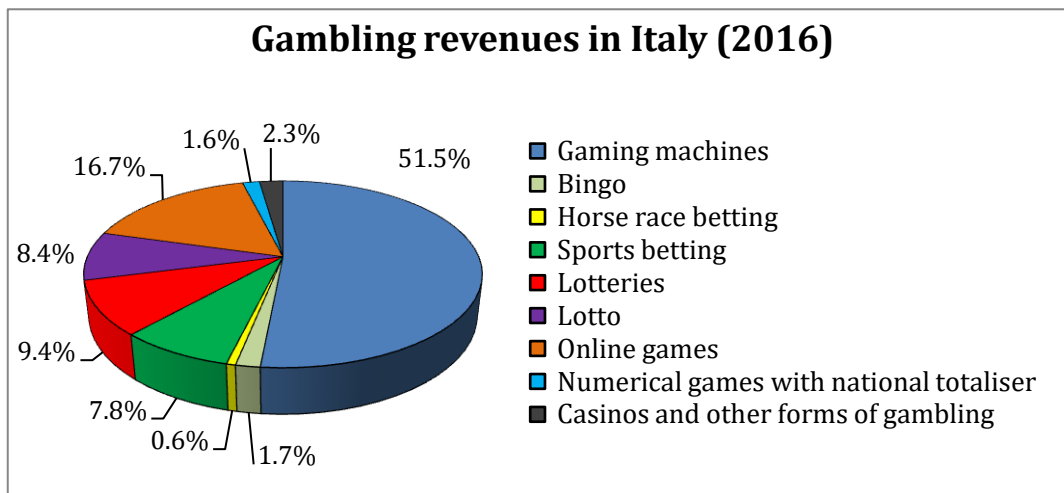
Concessionaries are private companies that, after a public call for tenders, receive by AAMS the license for the conduction of the electronic network, allowing the functioning of their work. The revenues collection is the sum of players' expenses and wins; concessionaries are responsible for the collection towards AAMS, and at this aim they stipulate specific contracts with managers. Managers distribute and install game devices, and they handle the money collection, assuring the compliance

¹ Source: www.lastampa.it/2017/01/03/italia/cronache/il-gioco-dazzardo-strega-gli-italiani-business-record-da-miliardi-q3Y0HABeIGu0C5tFBrFRKM/pagina.html

² Source: www.ilsole24ore.com/art/impresa-e-territori/2017-01-23/spesi-95-miliardi-lotterie-e-slot-e-gioca-47percento-minorenni-114623.shtml?uuid=AEKluoF

³ Art 88, no.773, 18th June 1931

with the running law. Game devices are finally delivered to shopkeepers who require them and receive a percentage over bets in exchange for the space made available for the working of devices. This ramified system is the consequence of a long series of public interventions occurred over years and which we are going to approach in chapter 6.



Personal elaboration of AAMS game collection data, available on AAMS official website, (2016)

On the other hand this business has created more than 300.000 pathological gamblers (and another million of Italians are considered high risk of pathological gambling) and it has triggered a sanitary expense of over € 6 billion. Let's now go deeper in the analysis of the 4 most representative gambling activities.

2.1. Casinos

The first thing we think about when hear the term *Gambling* is probably the casino, because it represents the traditional place where people go to spend their money for hazard purpose. Notwithstanding, as we will see later, other activities have replaced the role of leader in the Italian gambling business, leaving to casinos just a marginal part of it. A casino is a facility which houses and accommodates certain types of gambling activities. They are often built next to or combined with hotels, restaurants, retail shopping or other tourist attractions. Clients of casinos can play different games of chance, sometimes combined with elements of skill, such as craps, roulette, baccarat, blackjack and video poker. In all the games practiced, the house, that's the casino itself, is always favored. This happens directly, when odds for desk's win are higher than those for the player (such as in roulette game); and indirectly, when the desk handles the game between two players, withdrawing a share of the jackpot (such as in chemin de fer). Often a big income is constituted by tips left to the croupiers, people employed to manage the games. Many jurisdictions worldwide have a minimum gambling age which spans between 16 and 21⁴. In Italy the minimum age to access a casino is 18.

The legalization of casinos is a very controversial issue. The main reasons why people blame casino business are moral and religious in nature. In particular they worry about negative social influence and about uncertainty of economic benefits from their legalization. In the last decades, casinos have been declared legal in plenty of nations, for different reasons; but the greatest motivation lays in tax revenues. Taxes over casinos usually have a relatively high rate, thus they offer such

⁴ Source: Douglas M. Walker - *Casinonomics, The Socioeconomic Impacts of the Casino Industry*; (2013)

an easy source of revenue for politics and politicians⁵.

Douglas Walker and John Jackson's article (1998) is one of the deepest empirical studies of the relationship between legalized gambling and local economic growth. This research exploits the regression analysis to address two key questions:

(1) Does legalized gambling contribute to state economic growth?

(2) Must gambling be exported for economic growth to occur?

They found evidence that casino gambling raises country income but also that there is no need for the state to export its business in order to achieve the economic growth. Among these benefits are direct and indirect employment from the construction of the casino to its management, taxes collected by the government and the increase in customer's utility given from additional entertainment choices.

In Italy casinos are private places reserved to gambling, otherwise forbidden in the other public spaces. There are only four casinos, all concentrated in the Northern Italy: Campione d'Italia, Saint-Vincent, Sanremo and Venice. Despite Italy is one of the most active country in gambling, the Italian casino industry has entered a period of crisis since many years. The most emblematic example is the one of Saint-Vincent casino: it was founded in 1947 and since then it has always been an important economic source for Val d'Aosta region. Notwithstanding, the yearly income of the structure, which also has debts for € 38 million, has decreased from 125 million in 2003 to 60 million in 2016, and the number of entrances has halved. Saint Vincent casino seems to have the most dramatic situation, but also the other Italian casinos appear to sail in difficult waters. While Casinò di Venezia shows debts for € 2

⁵ Source: Leighton Vaughan Williams, Donald S. Siegel - *The Oxford Handbook of the Economics of Gambling*; (2013)

million, casino of Sanremo has already operated a reduction of its labor force by 60 units out of 320 employees. The reasons cannot be demanded only to the economic crisis because all the other gambling sectors didn't show symptoms of downturn over the last years. According to Fabio La Rosa and Antonio Sorci, the law forbidding to smoke in closed places has played a significant role in the decrease of affluence. Other causes lay in the diffusion of other forms of gambling such as betting, lotteries, slot machine, and above all online games. Facility of access and infinite availability of games has made people realize that it's much easier to challenge the fate by their own homes than in a casino⁶. Gambling market keeps accounting for billion and billion of Euro, but casino market is sinking; while slot machine and betting centers have increased in number, the 4 casinos (all located in peripheral areas of the country) remain accessible only for customers wealthy enough to afford the travel and the entry⁷. While physical casinos represent one of the biggest source of gambling revenues for many nations such as United States, Singapore, Canada and Australia, accounting for an average of 15% of the revenues of the local gambling industry, in Italy the situation is completely reversed and current data (2,3% of the gross gambling revenues in 2016) seem to doom casinos to an inevitable disappearance in the next decades.

⁶ Source: www.aostaoggi.it/attualita/9958-la-crisi-dei-casino-in-italia-rien-ne-va-plus.html

⁷ Source: Fabio La Rosa - *Il gioco d'azzardo in Italia. Contributi per un approccio interdisciplinare*; (2016)

2.2. Lotteries

Lottery is a common legal form of gambling, based on the drawing of numbers for a prize (generally money). Lotteries are banned in some countries, while some others adopt and regulate them also at a national level. There is a huge and active market for lottery products worldwide. People around the world spend the equivalent of millions of Euro on different lotteries every day. In 2010 the worldwide sales of tickets for lotteries accounted for \$ 245 billion. A prize is defined “*fair*” if it is equal to the ratio between the single ticket and the probability to win ($1 / \text{total of tickets sold}$). Actually this condition is never reached in a normal lottery, given that the arrangement of the lottery is a cost itself and that the organizer wants to earn a share of profit.

Statistics say that odds of winning big prizes are absolutely small and the majority of people playing in a specific drawing don’t win any kind of prize. Other forms of gambling, such as casino games or betting are much more profitable, given a higher expected value, higher odds of winning prizes and a larger share of bettors winning at least a little prize. In addition the other forms of gambling offer some non-pecuniary benefits to the players, such as the fun and the entertainment of watching a match or a race or playing actively a game at the casino. Why, despite all these elements, lots of people keep playing lottery games?

Adam Smith offers an interesting analysis of the topic in his famous “*Wealth of Nations*” (Book 1, Chapter X).

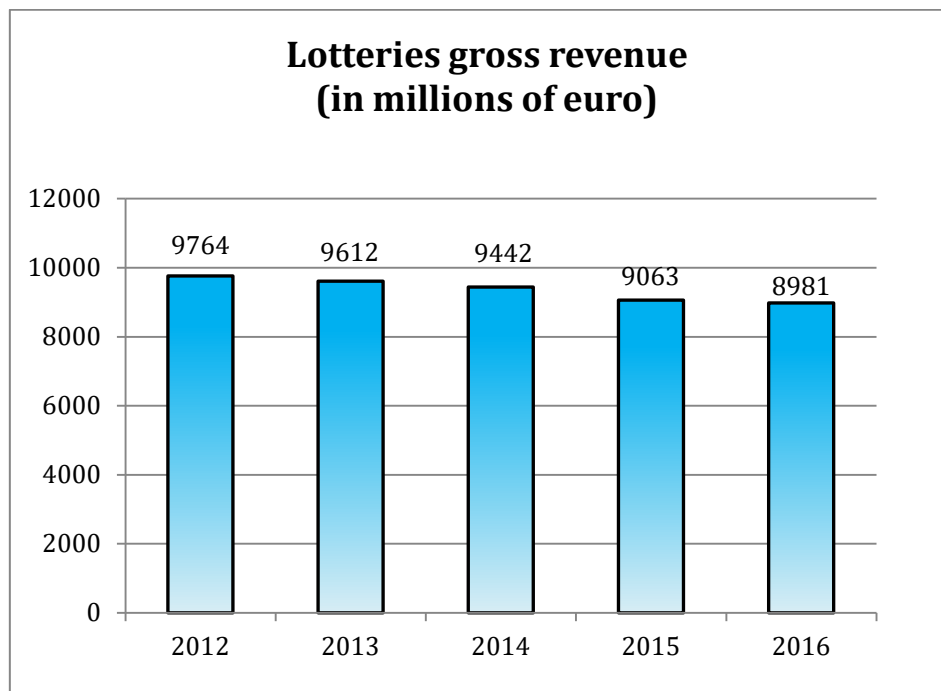
“The world neither ever saw, nor ever will see, a perfectly fair lottery; or one in which the whole gain compensated the whole loss; because the undertaker could make nothing by it. In the state lotteries the tickets are really not worth the price which is

paid by the original subscribers, and yet commonly sell in the market for twenty, thirty, and sometimes forty per cent. advance. The vain hope of gaining some of the great prizes is the sole cause of this demand. The soberest people scarce look upon it as a folly to pay a small sum for the chance of gaining ten or twenty thousand pounds; though they know that even that small sum is perhaps twenty or thirty per cent more than the chance is worth."

The purchase of lottery tickets can't be explained by a strict decision model based on the maximization of the expected value because the lottery tickets cost much more than the expected gain.

Assuming that players are rational utility maximizer, Adam Smith suggests that the utility from the investment combined with that form of entertainment components are sufficient to push plenty of people playing lotteries. Besides the lottery prizes, the ticket can enable some players to experience a kind of thrilling dream of becoming wealthy. In this way, the disutility of an almost sure monetary loss may be outweighed by this combined utility of monetary and non monetary components, making the purchase of the tickets a rational decision for the person.

As said in the previous chapter, in Italy we distinguish between immediate drawing lotteries and the traditional delayed drawing lotteries. The first category includes 55 active games, gathered under the name of Gratta e Vinci; this is the most spread game in our country with more than 60% of Italians playing at least once in their life. In the graphic below we can observe that the money invested in lotteries over the last five years have slightly decreased from € 9,7 billion to € 8,9 billion, but they still represent an important sum. All the lottery rights in Italy belongs to Lottomatica, the only private company enabled to organize these games together with Lotto.



*Personal elaboration of AAMS game collection data
available on AAMS official website, 2012-2016*

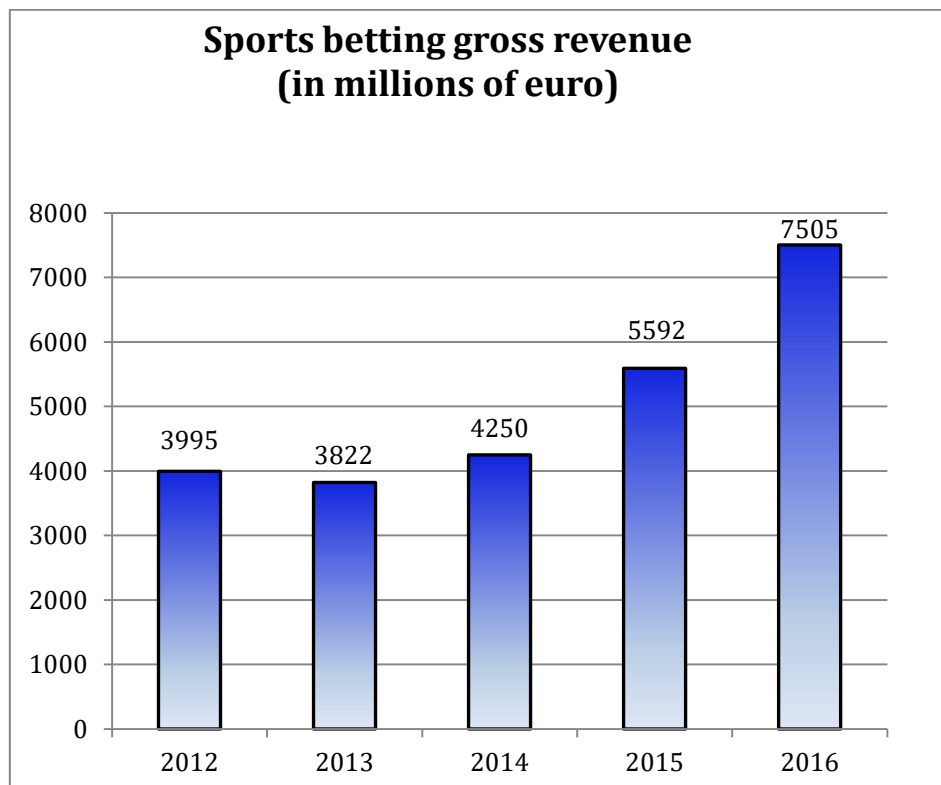
2.3. Betting

Sports betting is one of most common gambling game, especially for men, in Italy. It consists in predicting sports results and placing a wager on the outcome. The first sport betting game has been Totocalcio, established in 1946 and still played every turn of Serie A football league. The aim of this game is predicting the results of 13 (14 since 2003) football matches of the Italian league and it was the most played sport betting game until the introduction of the fixed rate betting in 2006. This new revolutionary form of gambling in fact, allows to bet on many more matches, choosing the import and the event to play. We could say that this new betting system is much more customizable: people can play only the matches they want, knowing in advance the prize they could win. That's the reason why fixed rate betting rapidly

substituted Totocalcio, that is still played only by an irrelevant share of old affectioned customers. Sports betting represents one of the most increasing sector of the gambling industry. Everybody knows that Italians are football lover and this passion is a factor that boosts people to bet over matches. If we look at the trend of the last 5 years we can notice a constant growth: in 2016 the amount of money played was € 7,5 billion, that means an increase of almost 35% above the money played in 2015. This tremendous result is due to the diffusion of betting websites on the internet, that have made it possible to play everywhere at every time. In 2016 the number of licenses conceded by AAMS to the various bookmakers was 247⁸. This means that a lot of suppliers are active in the industry, implying a high level of competition but it's also witness of the fact that betting is a blooming sector. Despite the presence of so many suppliers, it's also true that there are just 5 "champions" able to grab The majority of the market share. These are Bet365 (16,7%), SNAI (12,4%), Eurobet (11,3%), Sisal (9,78%) and Lottomatica (9,31%)⁹.

⁸ Source: AAMS game collection data 2016, available on www.agenziadoganemonopoli.gov.it

⁹Source: www.casinonewsdaily.it/2017/01/11/settore-delle-scommesse-sportive-registra-raccolta-circa-75-miliardi-euro-nel-2016/



*Personal elaboration of AAMS game collection data
available on AAMS official website, 2012-2016*

2.4. Slot Machines

The gaming machines business is probably the most interesting one, especially in Italy, given that just slot machines and video lottery revenues have accounted for more than a half of the whole Italian gambling industry over the last 5 years. According to the American Gaming Association (AGA 2010) we define a slot machine as *“any mechanical or electrical device in which outcomes are determined by a random number generator located inside the terminal”* and we define the closely related video lottery terminal as *“an electronic game of chance played on a video terminal that is networked and can be monitored, controlled and audited by a central computer*

system". The designation electronic game device includes both categories and represents "*any mechanical or electrical game of chance including slot machine, video lottery terminal, video bingo, video pull-tabs and video poker machines*"¹⁰.

Actually slot machines and VLT are not the most played game if we look at the whole community of people; other games such as lottery or betting are definitely played by a higher share of people. Recent studies showed that just 2 Italians out of 100 admitted to play or have played also occasionally with gaming machines.

So how can we explain the huge amount of money "invested" in these devices? Many researches over the last years have investigated the thesis that gaming machines could be disproportionately related with problematic gamblers finding a high degree of correlation between slot machines and problematic gambling. Canadian Community Health Survey (2003) showed that about 25% of video lottery players are pathological gamblers.

The reason of it lays in the powerful addiction caused to the players. It's hard to find a normal person playing occasionally with slot and VLT, while it's definitely more common for a non-serial player to buy a lottery ticket sometimes. Players of gaming machines are usually pathological gamblers, sick people without control of themselves. This disease makes them lose perception with reality, wasting money without any limit. This explains why in the last year more than 46 billion of Euro have been spent by customers on these devices in our country.

Let's now take a look inside a slot machine to better understand how they work. Legal slots are provided of a smart card, a kind of electronic brain paying out jackpots after a certain number of turns played: there is a gathering cap changing for every model of slot, but usually sticking around € 30.000. The mechanism is set to

¹⁰ Source: Leighton V. Williams, Donald Siegel - *The Oxford Handbook of the Economics of Gambling*; (2013)

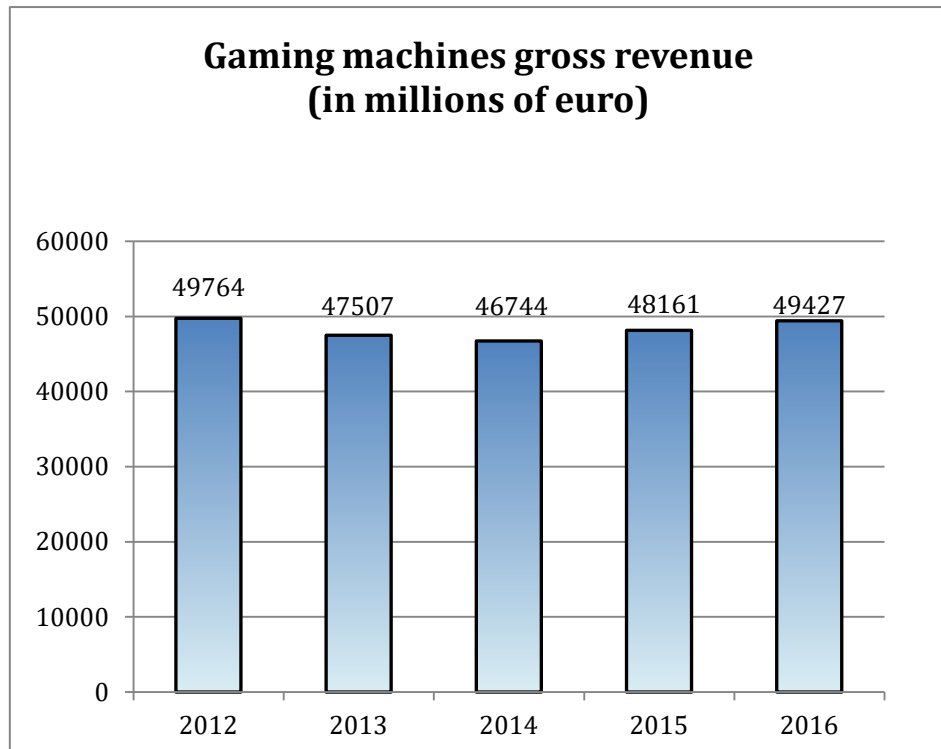
release to the players just a share of 74% (70% since 2016¹¹) of the whole money gathered. So only € 22.200 out of € 30.000 return into customers' wallet. It's obvious that prizes are lower than the money inserted given that the house always wins: in this case the house is represented by the State, together with game licenser (private societies handling the gaming machines monopoly and collecting taxes in behalf of the State), producers and the owners of bars or gambling houses hosting those devices. Wins are random: no one can foresee when the slot will align its symbols, giving a winning result. No one apart from AAMS officers and slot managers, which can access to the heart of every slot just inserting a password. In this way they can visualize for every single slot:

- The amount of money inside the slot (the money box that usually becomes full at € 30.000)
- The amount of money inserted in the device by players until that moment (also known as *in*)
- The amount of money released as prizes by the device until that moment (also known as *out*)

In this way the slot is “naked” and it's extremely easy to understand which machine has already paid and which hasn't. It's comprehensible that managers can access to the related data having the property of the devices, but this can trigger some problems: someone who knows ID number, city and address of a machine ready to pay out, could easily abuse of the information to empty it and rake off the cash.

¹¹ Financial Law of 2016

Clearly this behavior would be illegal and punishable by law but many of these cases happened and various operators admitted seeing or being part of this fraud¹².



*Personal elaboration of AAMS game collection data
available on AAMS official website, 2012-2016*

2.5. The new frontier of gambling: Online Games

The evolution of new digital technologies has entailed a significant change in the gambling world. If some years ago bars and casinos were the hubs where people went to play and bet, now it's the game itself that reaches directly players' houses, thanks to the Web. Also modalities and social aspect of the game have changed: during the 80's and the 90's lots of players attended the four Italian casinos, with a

¹² Source: N. Toffa - *Quando il gioco si fa duro: dalle slot machine alle lotterie di Stato*; (2014)

certain continuity, twice or three times a year. Today the identity of casinos has lost its importance and prestige: it's much easier for the player to sit in front of his computer with a credit card and start playing, without other strangers watching and judging him. Thanks to the Internet, plenty of game websites have appeared since 2000, offering all the games existing such as bingo, casino, poker and betting. These platforms showed immediately a wide catchment area, thus attracting the interest of sponsors, looking for new commercial and financial opportunities to cover and satisfy the different needs of players. The year 2003 signed the boom of online poker, which was presented as a new trendy game, image of a new cultural movement and of social elevation. The role of the player itself has changed its meaning: if before they were seen as anti-social actors, now they've become professionals and celebrities. In a couple of years a lot of new shows about poker and gambling appeared, both on the television channels (such as Wingo TV and also more popular channels such as Italia 1) and on the Internet, attracting more and more potential gamblers. In 2004 *Pokerstars* and *Partypoker* were the leaders of a highly growing market. At the end of the same year, the daily revenues of all the poker sites (which accounted for about 300) overtook \$ 2 million (in 2000 they were only \$ 100.000). Some among the main poker houses were even quoted on the stock exchange: for instance *PartyGaming* was listed on the London Stock Exchange at a market value of \$ 8,46 billion¹³.

Gambling websites have been able to cover homogeneously the total demand of players, independently on their geographic position: the gaming portals allowed the customers to play directly from their houses, quietly and anonymously, against other opponents from all the world. The possibility to play always and everywhere

¹³ Source: F.Daninos - *Storia del poker*; (2010)

implied a quick learning process for all the poker lovers, bringing to a significant increase in wins and in number of players. Everything is faster on the Internet, activities happen rapidly and above all in real time, in each part of the planet. Virtual houses are open 24 hours out of 24, entailing a continuous attendance of these spaces.

Besides benefits in time and space, online games include also the easiness and the new modalities introduced for payments. Comfort in payment is another important factor which has determined the diffusion of this new frontier of gambling. It just needs to use a credit card or an online bank account to have access to every gaming discipline: you can easily move from one lobby to another, playing different hands or games at the same time. This constant flow of activities makes extremely difficult to concentrate and to act rationally: people may lose huge amounts of money without realizing of their actual cash flows and of losses, which normally would influence their motivation and their gaming times.

In Italy every player accesses to a gaming or betting website through an electronic registration on an AAMS certified system. To complete the registration the user must insert his fiscal code: in this way the Italian Revenue Agency¹⁴ can verify the validity of the physical individual. Since that moment all the game movements are tracked, allowing the authorities to monitor and control the cash flows in order to prevent possible abuses or frauds. Among the measures adopted by controllers there are limitations of expenses to exclude minors from gambling. Who gambles online entrust his money in the hand of websites which are difficult to control: not always the money required to access an online casino are actually destined to it. The insertion of personal data related to credit cards or bank accounts involves many

¹⁴ Agenzia delle Entrate

risks of fraud. AAMS applies continuous controls to prevent these risks, writing down periodically a black list of all the unsecure websites: in 2007 the list counted 1242 websites; in 2017 the number of banned websites has increased to 6464¹⁵.

The online games boom of 2003 mostly derives from a sudden growth in interest in poker, commonly defined as *Moneymaker Effect*. This expression derives from Chris Moneymaker, an American amateur poker player who won the Main Event at the 2003 World Series of Poker and became a celebrity in a very short time thanks to online casinos¹⁶. His win is said to have revolutionized poker because he was the first person to become a world champion after qualifying at an online poker site. He started to play in little satellite tournaments and from the initial 39 dollars, he arrived to win \$ 2,5 million. This unbelievable challenge gave a huge importance to the poker phenomenon, attracting more and more non-professional players to follow the path of Moneymaker, trying to have his same success¹⁷. This boom was immediately verifiable in numbers: in just one year the number of participants to World Series of Poker tripled from 839 to 2576. The increase of users implied also a consequent growth of prizes and categories of tournaments on the Web. Looking at the graph below we can have an idea of all the money invested online for gambling over the last five years. The percentage of online gambling revenues over the whole gambling business has been steady around 15-16%, despite a slowdown in 2014. Just in 2016 we register a significant increase in absolute terms (almost € 16 billion collected), but the share in relative terms still remains under 17%: that's because there has been a rise in the gross income of the entire gambling industry and not only for the online sector. Anyway this form of gambling represents the

¹⁵ Source: www1.agenziadoganemonopoli.gov.it/files_siti_inibiti/elenco_siti_inibiti.pdf

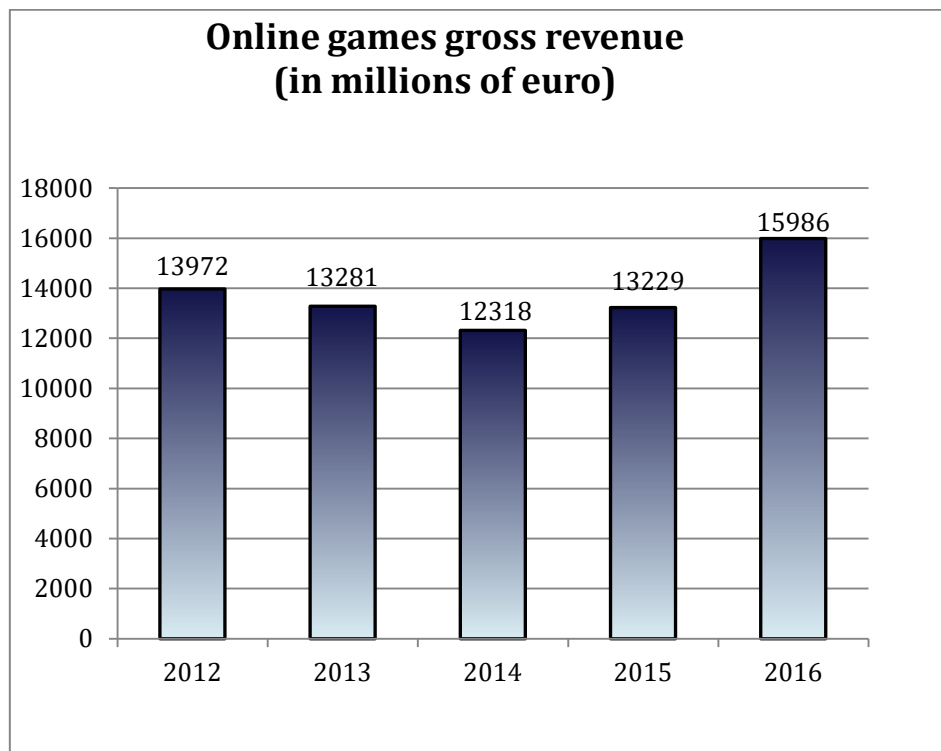
¹⁶ Source: Las Vegas Sun, The Biggest Stories in the World Series of Poker. 18/12/2009

¹⁷ Source: F. Daninos - *Storia del poker*; (2010)

second source of revenues in the whole industry. According to these data and given the unstoppable digitalization process we are facing nowadays, we can expect a constant growth of the market share of this sector also for the next years, both in absolute and in relative terms, given that many offline games are going to be replaced soon by the digital wave¹⁸.

The economic and cultural sector of online gambling is complex, blooming and full of ambiguity, but at same time it preserves an own tradition and a history. It took strength in a moment of economic downturn in Italy and all over the world, also because people were looking for opportunities to make money, besides having fun. Economic crisis, digital world, social media and mobile devices have nowadays assumed the role of antagonists of casinos and offline gambling. The game itself has progressively lost its social aspect, that used to be the mere pleasure of meeting and spending time with other people, exploiting the game as common factor to have fun together: what matters most now is being more independent and autonomous.

¹⁸ Source: D. Peel - *Economics of Betting Markets*; (2009)



*Personal elaboration of AAMS game collection data
available on AAMS official website, 2012-2016*

3. Social analysis of the phenomenon

3.1. Profiles of players

Games have always represented a classic topic for a better comprehension of how the economy and the society of a country work. Various sciences and scholars have committed to define player's profile, in order to understand who he is and what he searches into the game. There is in fact a direct link between the comprehension of the community's behavior and game attitude. Roger Caillois, a French sociologist of the XX century, described different game types which determine different behaviors in players. According to his study we can subdivide games in four categories¹:

1. **Competition game**, where the outcome basically depends on individual skills, and where success is achieved thanks to personal competencies (for instance sports).
2. **Game of luck**, where the outcome is determined by the case: the most emblematic example is gambling, where the central role is played by luck, which the player cannot interact with.
3. **Game of disguise**, where the individual can assume different personalities through costumes and mimicry.
4. **Game of giddiness**, where excitement and illusory pleasure prevail, making people lose the perception of reality (for instance luna parks).

Gambling gathers almost 80% of over 18 population. Obviously not every player shows an addiction to the game and, in the majority of cases, gambling only

¹ Source: R. Caillois - *Les jeux et les hommes: le masque et le vertige*; (1958)

represents a harmless hobby, which doesn't constitute a risk for social and economical life of players. But for a little share of those people, gambling means the most important activity of their lives: that's the case of pathological gamblers. Robert Custer, a famous American psychiatrist, was one of the first experts to face the problem of pathological gambling. In his article *Profile of the Pathological Gambler*, he defines the following six types of players:

- **Professional gambler:** he makes of gambling a real job and he's able to maintain himself just by playing; he prefers games with high level of competitiveness and he can keep his behavior under control. He is not game addicted (The great poker champions belong to this category).
- **Antisocial gambler:** he only wants to win, no matter how; he cheats at the game and prefers illegal gambling.
- **Casual social gambler:** he uses gambling as a tool of socialization and temporary entertainment; he is not absorbed by games. Games don't affect his personal and professional life at all.
- **Serious social gambler:** gambling is his main source of fun and it represents his favorite hobby; anyway it still doesn't interfere with player's job and social life.
- **Relief and escape gambler:** gambling in this case is a remedy to boredom, anxiety, depression and scarce self esteem. The player uses games more as analgesic than as excitant and he is defined as inadequate, compulsive but still not addicted.
- **Compulsive gambler:** gambling is the central aspect of his life, he has no more control of himself; his work, his family and all the other interests

seem to disappear from player's mind, who employs all his efforts and energies on games: it's the pathological gambler. The euphoria deriving from games brings the player to a state of addiction (i.e. players of fruit machines are overwhelmed by lights, sounds and switches, achieving a condition of hypnosis).

Fortunately only few people achieve the last level, being more disposed than others. The transition from social gambler to compulsive gambler is neither brief nor automatic, but it requires a slow and complex process, signed by particular events and situations in the life of a player.

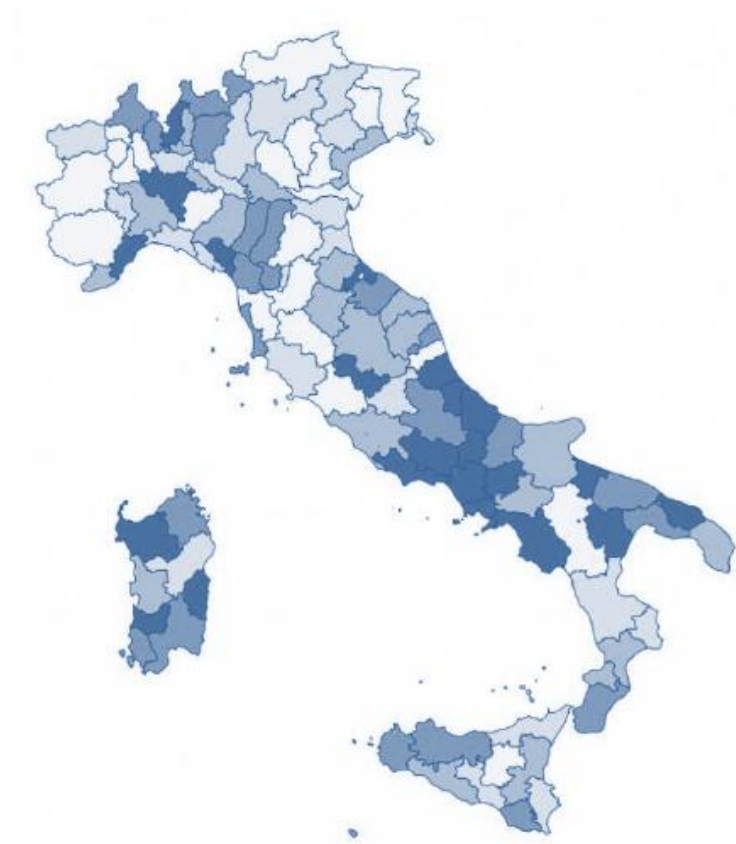
3.2. Geography of gamblers

Since the liberalization of 2003, the industry of gambling in Italy has followed an outstanding growing path, unlike many other sectors of Italian economy. In less than a decade the country has leaped ahead in the world gambling ranking thanks to the introduction of slot machines and VLTs in the most traditional places of social life: bars.

In the following picture are represented the Italian provinces according to the ratio of how much is spent for gambling out of the level of income per capita. The five different shades of colors represent the level of distribution, so the dark blue refers to the 20% of provinces with the highest gambling expenses, the white refers to the 20% of provinces with the lowest gambling expenses and so on².

² Source: M. Esposito - *Geografia economica del gioco d'azzardo in Italia*; (2015)

Gambling expenses per province



Source: M. Esposito, Geografia economica del gioco d'azzardo in Italia; (2015)

The record of expense is held by Pavia with 19,8%, obtained as the ratio between € 2.954 played and a taxable income (IRPEF) of € 14.872³. The “wiser” province is instead Trieste, where the percentage is only 5.8%. Let’s now go deeper in the individuation of the typical Italian gamblers, focusing on their age, social status and location. First of all we need to recognize that the profile of the average gambler has

³ Data of 2014.

The source for the expense is AGIMEG, Agenzia Giornalistica sul Mercato del Gioco. <http://www.agimeg.it/?p=2768>.

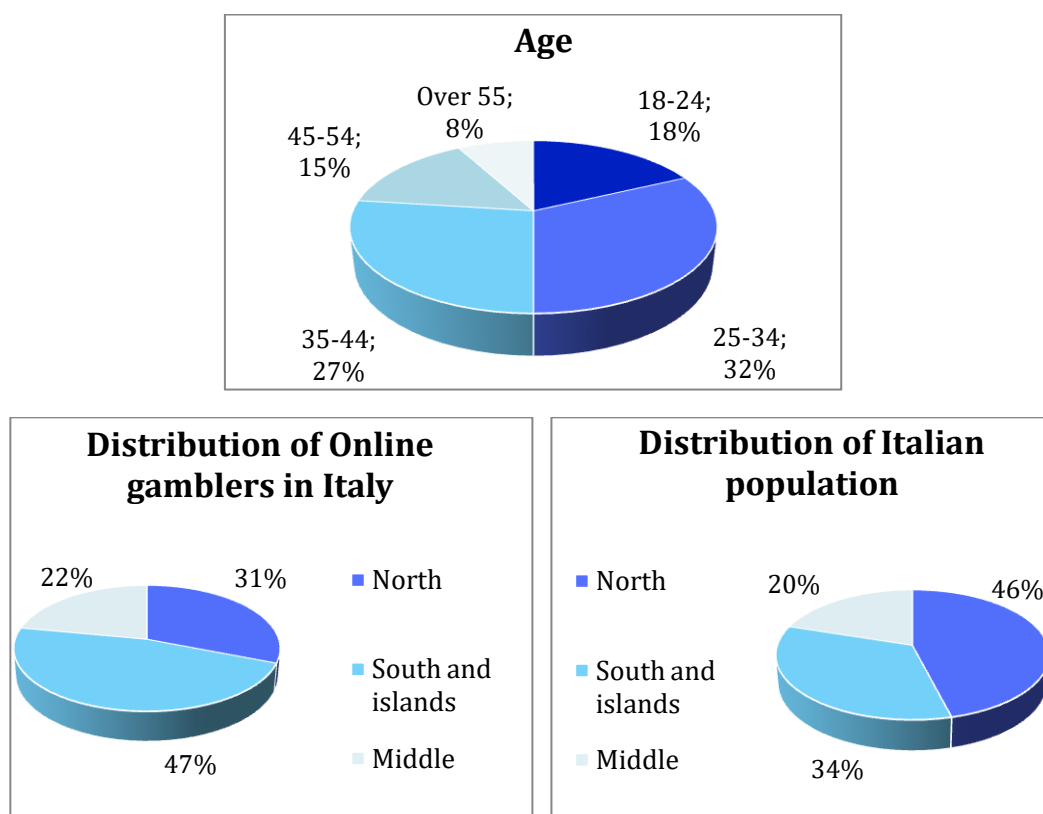
The source for the taxable income IRPEF is MEF, Dipartimento delle Finanze, http://www1.finanze.gov.it/analisi_stat/index.php?tree=2013.

changed over the last twenty years. The age has reduced, comprising people between 40 and 45 years old, but it is also lower for what concerns online games. The typical gambler usually belongs to the middle-low income class but, as we saw before, this phenomenon also affects wealthier people. The biggest share of players is constituted by men (53%), even though the number of women has incredibly increased lately. Some games such as sports betting, casino and horse race betting still account for a huge amount of men playing; but some others such as slot machines and bingo have registered a percentage of women also larger than men. This is an impressive result, considering that twenty years ago women represented only 10% of the total of gamblers. The reason of this vertiginous rise stands in a cultural factor, a bigger emancipation: women are more free to go out and they finally have a financial autonomy that was unthinkable some decades ago. Obviously also the advertising has played a key role, reaching the whole community through every possible way: radio, television, Internet. Women usually prefer the so-called “*escape games*”: slot machines, lotto, Bingo and Gratta e Vinci, as they represent a kind of shelter against the ordinary monotony.

The majority of online gamblers are aged between 25 and 35 and play twice or three times a week, with games sessions of 2-3 hours on average. They usually play in the evening at their homes. The share of men playing online is about 60%, but the number of women is going to increase in the future: the anonymity and the electronic mean justifies the preference of women for online games; that allows them to be invisible to other men, avoiding judgments and awkward comments. With the appearance of digitalization, young people have started playing more frequently. Game is becoming an habit for teenagers, implying more costs for them and above all, for their families.

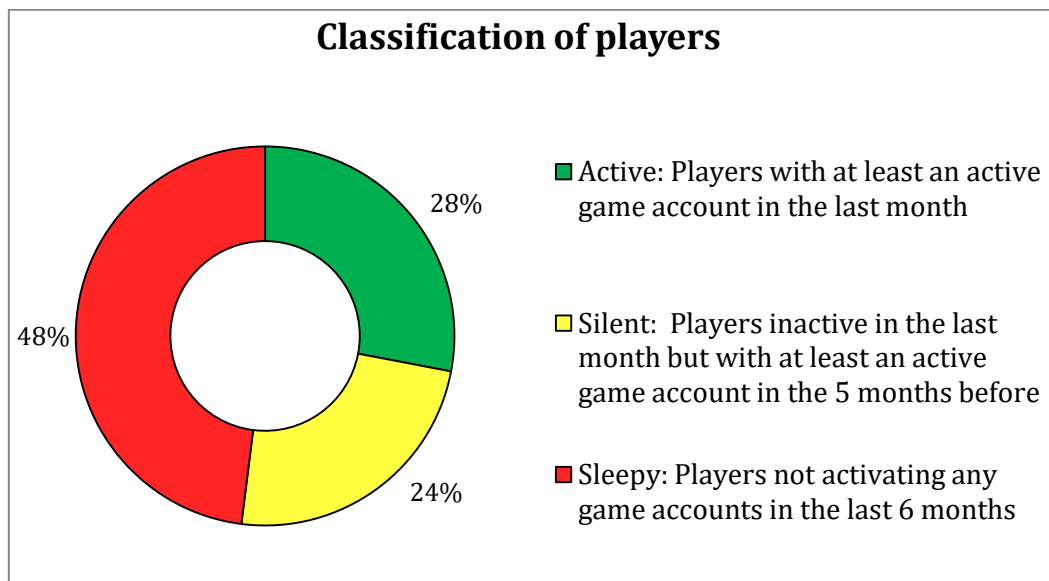
Which are the reasons that bring young people to play? Francesco Di Maria, professor of Dynamic Psychology at the University of Palermo explains that the main reason lays in the fragility of teenagers, who are guided by curiosity and by the crave of being adult; in response they pour their interest on games, underrating the related risks.

Since 2008, year of the boom of online games in Italy, at least an adult out of 10 has played online at least once, for a number of 2,6 millions of players. We can define a distinctive profile of the average Italian online gambler: a man, aged 25-44, living in the Middle-South of Italy⁴. Splitting out the whole category of online players per age ranges and regions of residence we find out the following groups:



Source: Osservatori.net (2016)

⁴ Source: E. Povoledo - *Fears of Social Breakdown as gambling Explodes in Italy*, The New York Times, 28/12/2013



Source: Osservatori.net (2016)

About 50% of players live in Southern Italy (islands included) and by adding the middle Italy share, the percentage of players reaches the 70% of the whole community. Almost 75% of online active gamblers spend less than 50 Euro per month, while a wide slice of the remaining 35% spend much more than 50 Euro. Discontinuity is an element which alludes to the playful aspect of online games: it means that online games are appreciated by players more as source of entertainment than as source of enrichment.

In the chart below we can observe the distribution of revenues, expenses and profits of the last three years for each region. The three regions registering the bigger sums of money invested are Lombardy (€ 14,6 billion), Lazio (€ 7,9 billion) and Campania (€ 7.3 billion). The results are not surprising given that those are the most populated regions in Italy, but if we calculate the average expense per inhabitant we

discover that Abruzzo is the region with the highest ratio (€ 355 per inhabitant), followed in order by the three regions listed above.

Game volume per region (in millions of Euro)

REGION	Money Collected			Players' wins			Total players' expenses		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
ABRUZZO	1.869	1.875	1.978	1.442	1.452	1.508	421	416	470
BASILICATA	468	486	510	352	367	378	115	117	131
CALABRIA	1.590	1.651	1.820	1.196	1.254	1.513	388	390	307
CAMPANIA	6.611	6.821	7.291	5.006	5.231	5.512	1.593	1.576	1.779
EMILIA ROMAGNA	5.914	5.994	6.234	4.639	4.679	4.766	1.245	1.293	1.468
FRIULI VENEZIA GIULIA	1.302	1.348	1.392	992	1.035	1.047	306	311	345
LAZIO	7.668	7.611	7.926	5.935	5.914	6.064	1.723	1.687	1.862
LIGURIA	1.867	1.880	1.933	1.437	1.455	1.450	428	422	483
LOMBARDIA	13.868	14.065	14.585	10.760	10.944	11.084	3.094	3.107	3.501
MARCHE	1.800	1.818	1.916	1.381	1.402	1.448	405	412	468
MOLISE	354	352	359	270	269	268	82	82	91
PIEMONTE	4.923	5.060	5.127	3.804	3.917	3.882	1.113	1.136	1.245
PUGLIA	3.969	4.074	4.398	3.037	3.122	3.308	922	941	1.089
SARDEGNA	1.504	1.542	1.663	1.133	1.149	1.196	366	385	467

SICILIA	3.836	3.890	4.263	2.859	2.934	3.124	969	941	1.138
TOSCANA	4.446	4.566	4.794	3.466	3.554	3.671	966	1.000	1.124
TRENTINO ALTO ADIGE	1.164	1.180	1.215	921	935	950	241	243	265
UMBRIA	1.031	1.029	1.099	796	792	832	233	235	267
VALLE D'AOSTA	127	132	133	95	99	98	32	32	35
VENETO	5.670	8.850	6.101	4.395	4.551	4.666	1.256	1.284	1.435
TOTAL	69.982	71.225	74.737	53.916	55.053	56.765	15.898	16.010	17.973

Source: AAMS report 2016, available on the official website

3.3. Technological revolution and game addiction

Enthusiasm towards gambling affected first of all people with a larger financial availability, including celebrities such as sport champions or famous actors. Then, by exploiting the notoriety given by testimonials, it has reached also people belonging to the middle-low income class. This process consists of an *emulative effect* starting from the bottom: people from middle-low classes decide to copy those big champions in their challenge against chance. For instance Ben Affleck, Cristiano Ronaldo, Leonardo Di Caprio, Ben Affleck, Neymar and Paris Hilton are just a bunch of VIPs having decided to undertake a career in poker. The involvement showed by these stars has made sure that poker became more popular and fashionable, achieving extremely high levels of notoriety. Dedicated TV shows such as the World Poker Tour, boosted also more the desire of people to start playing: the offer

inevitably started to grow, especially online, giving birth to various types of games, lobbies to play receiving people from all the world.

The causes which boost individuals toward compulsive gambling are basically boredom of ordinary life, difficulty to accept their own lives, and banality of a routine which is source of unacceptable frustration. Some years ago some specialized centers have appeared in Italy, with the aim of helping pathological gamblers to face their disease, by recognizing and unmasking all the causes and the deceptions having conditioned players' existences. Compulsive gambling belongs to the so-called new addictions, where the mechanism of addiction is not generated by a physical matter but by a behavior. It's important not to underestimate player's illusion to be able to control his instinct, particularly in those situations where a clear economic and psychological difficulty emerges. A large part of the dependence is surely related to the new technologies, which have radically changed the way people interact with real world. After the birth of language and the invention of press, the third big revolution of our history was signed by the new frontier of communication, Internet and the new media. The main feature of these new communication systems is the high mass diffusion, the interactivity and the strong customization. Online gambling relates to this condition, since it has become more accessible and easier to enjoy, thanks to the new media. The supply of entertainment has become wider: the number of lotteries, betting, and casino games on the Web has grown exponentially in just a few years. The internet-addicted uses the Web for research and entertainment, instead of professional reasons and he is forced from an unstoppable crave of surfing the Internet for a long time period. The radical change in the game sector as consequence of the new technological wave is defined as *New Gambling*.

The New Gambling offers a new lonely, decontextualized and global way to play; that can cause addiction in individuals subject to risk such as teenagers, retired people and families with children. The new offers of games have some peculiar aspects which make them more dangerous than the traditional gambling, for instance:

- Immediate and capillary availability on the territory;
- Easiness of access;
- Lack of relational aspects;
- Automatic behavior;
- Huge visibility on public spaces through advertising and sponsorships, with a communication strategy focused on every media.

The introduction of online gambling with its related technologies has constituted a new social issue, given also the ambiguous position of the government that in the beginning forbade it and then imposed itself as monopolist and first promoter, considering the significant tax revenues deriving in particular from the middle-low income class. This is the reason why legal gambling has been renamed by press as “tax on poverty”. The world economic crisis of 2008 didn’t have a significant effect on the sector at all; in fact Italians have kept spending sizable sums in gambling. The Italian sociologist Maurizio Fiasco has been one of the first scholars to underline the strong impact of gambling on our society⁵. His thesis explains that the success of gaming is inversely proportional to the economic growth of a country. At this purpose he says: *“The gambling boom happened in years characterized by uncertainty, economic stagnation and radical policies of public debt reduction through higher tax burden and less credit flow for investors and consumers (...)”. When the*

⁵ Prof. Maurizio Fiasco, sociologist of Consulta Nazionale delle fondazioni anti-usura

economy goes bad, gambling flourishes and vice versa. During economic crisis it happens that the attractive power of games increases because they seem to mean a valid alternative to work, in order to increase the income. On the contrary, with the dynamization of economy, the search of non aleatory solutions becomes preferable."

From the final consumer's point of view, the game is identified as a real way to escape from the crisis. Most of people have played hoping to reach a condition that would be impossible to achieve otherwise, given the precariousness of jobs of the last years. Notwithstanding, behind the illusion of a possible win there is the mental stability of the individual, that can be altered by the effect of addiction in a short time.

4. Customer's choices in uncertain scenario:

the expected utility

Every day individuals live situations where they must take a decision, they must face different challenges, they must evaluate and interpret outcomes of possible choices, in order to choose the best alternative, that may consist of a simple purchase of a product, or a particular investment. If people were provided of every necessary information in each of their decisions, there would be no need to study their behavior because all the elements helping people taking decisions would be known, as well as the consequences deriving from each of them. The problem arises when the subject is supposed to take a decision but he doesn't dispose of the right information to calculate and foresee the consequences of his choices. Gambling activity belongs to this particular category of situations, in fact players operate in an uncertain scenario. Roulette, lotteries, roll of dices, sports betting, tosses of coins: every game concerning hazard is related to probabilities and to the consequent evaluations and final decision by the player. Technically speaking there are three different scenarios where an individual can take a decision: certainty, risk and uncertainty (or ambiguity). The main theory regarding the analysis of people's behavior is the "*Expected utility theory*", elaborated by von Neumann and Morgenstern (1947)¹. This theory is accepted and applied as an economic model of human behavior, considering man as a rational and predictable being; according to

¹ John von Neumann was one of the most important mathematician of the XX century. Moreover he contributed to the development of physics, computer science and economic theory. Oscar Morgenstern was economist from Princeton who developed the theory of games with von Neumann.

the theory, the individual knows the various available alternatives, he's able to evaluate them and finally chooses the one offering the biggest utility. We are now going to see how customers think in situation signed by uncertainty and risk through the explanation of this theory and its application in gambling.

4.1. Expected Utility theory

Uncertainty is a fundamental characteristic of human life. People take risks also taking a shower or crossing the road, even more so when they employ their money. Economists use the Expected utility model by von Neumann and Morgenstern (1947) to explain choices made by individuals in uncertain situations. This theory is based on a deductive process starting from a bunch of axioms defining rationality requirements, linked to choices and preferences of the subject. When a customer stays in front of various alternatives without knowing which one is going to occur, but knowing the relative probability of each one, he will opt for the alternative offering the highest expected utility according to the available resources. In other words, we could say that the expected utility constitutes a criteria allowing people to select the best alternatives in aleatory conditions. With the term *utility* we can identify an index of preferences for the customer according to the level of "pleasure" he gets by the satisfaction of his needs. According to Daniel Bernoulli, who was the first mathematician having applied this theory to solve the St. Petersburg Paradox:

"The determination of the value of an item must not be based on its price, but rather on the utility it yields. The price of the item is dependent only on the thing itself and is equal for everyone; the utility, however, is dependent on the particular circumstances

of the person making the estimate. Thus there is no doubt that a gain of one thousand ducats is more significant to a pauper than to a rich man though both gain the same amount."

The totality of preferences maximizing customer's utility are identified in the expected utility function that can be seen as the function that associates every possible choice to its relative measure of utility; the function respects the order of preferences of a person, in fact it can be used to evaluate risky alternatives².

To explain analytically what an expected utility function is, we must start from the definition of *expected value* and from the description of a standard utility function. The *expected value* of a discrete random variable is the probability-weighted average of all possible values. In other words, each possible value the random variable can assume is multiplied by its probability of occurring, and the resulting products are summed together to produce the expected value. Every time a customer has preferences concerning consumptions in different situations, we can describe them with an utility function. Usually the way an individual chooses between consumptions in a state or in another one depends on the probability that the above mentioned state occurs. So the utility function depends both on probabilities and level of consumption. We can write the utility function concerning 2 possible alternatives in the following way:

$$U(c_1, c_2, \pi_1, \pi_2) = \pi_1 u(c_1) + \pi_2 u(c_2)$$

² Source: M. Li Calzi – *La matematica dell'incertezza*; (2016)

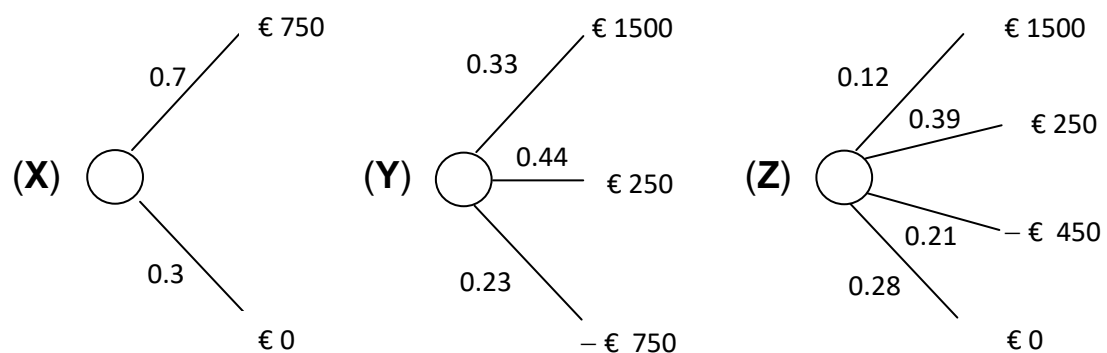
where C_1 and C_2 are the level of consumption in the state 1 and 2, while π_1 and π_2 indicate the probabilities that state 1 or 2 occurs. The utility function is nothing but the weighted sum of some functions of consumption in the two states. If one of the states is given for sure, for example $\pi_1=1$, then $v(C_1)$ is the utility of the certain consumption in the state 1. So the expression

$$\pi_1 v(C_1) + \pi_2 v(C_2)$$

represents the average utility, or expected utility, of the consumption plan (C_1, C_2) ³.

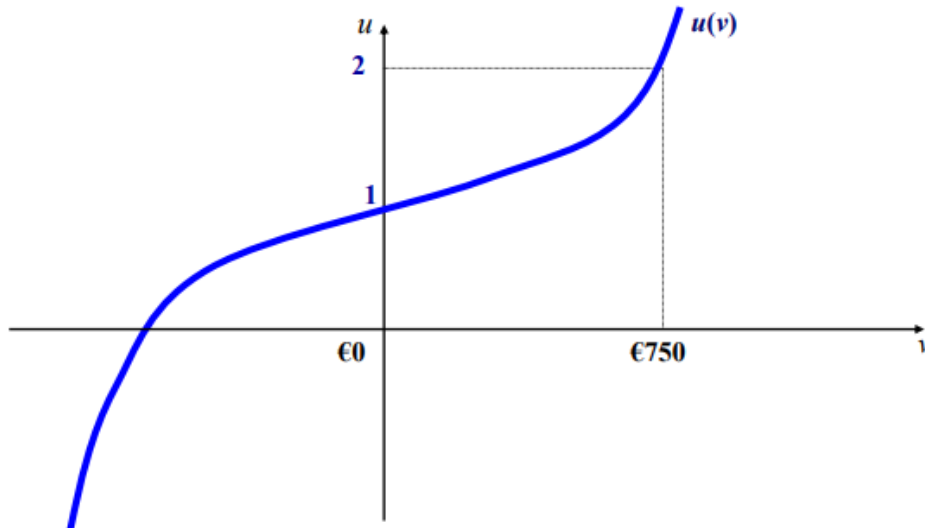
The Expected utility theory implies that when an individual is called to choose among different lotteries, he will compare the levels of expected utility related to the lotteries and he will opt for the lottery with the higher expected utility (EU).

Let's suppose that a man has to choose among the following three lotteries:



³ Source: Hal R Varian - *Microeconomia*; 2011

Let's suppose also that the individual is characterized by the following utility function:



If we consider the lottery (X), it pays € 750 or € 0 with probabilities $\pi_1=0.7$ and $\pi_2=0.3$. The utility associated to € 0 is $u(0)=1$; the utility associated to € 750 is $u(750)=2$. If the individual wants to decide according to the expected utility model he:

1. Uses his utility function to compute the utility related to each prize of every lottery;
2. He computes the expected utility of every lottery (he multiplies the probability of every prize by the corresponding utility and eventually he sums the products); for instance the expected utility of the first lottery is

$$U(X) = 0.7 * u(750) + 0.3 * u(0) = 0.7 * 2 + 0.3 * 1 = 1.7;$$
3. He chooses the lottery with the higher expected value.

The expected utility values for each lottery are the following:

$$EU(\mathbf{X}) = 0.7 * 2 + 0.3 * 1 = 1.4 + 0.3 = 1.7$$

$$EU(\mathbf{Y}) = 0.33 * 4 + 0.44 * 1.35 + 0.23 * (-1.5) = 1.32 + 0.59 - 0.345 = 1.57$$

$$EU(\mathbf{Z}) = 0.12 * 4 + 0.39 * 1.35 + 0.21 * 0 + 0.28 * 1 = 0.48 + 0.527 + 0 + 0.28 = 1.29$$

So according to the expected utility model, a person characterized by the utility function showed above should opt for the lottery (X), given that it offers the higher expected utility.

4.2. Risk avoidant and risk seeking

Finding an activity or a human behavior which is not characterized by uncertainty or risk is extremely difficult. Anyway before introducing the concepts of risk avoidance and risk love we must make a clear distinction between uncertainty and risk: the two terms are often erroneously used as synonymous even if their meanings are different. We have a context of risk when information are related to casual events with a given probability to occur.

Instead in a context of uncertainty every action brings to different consequences deriving from casual variables, which are not clearly definable through probabilities. The lack of information about an event creates uncertainty, so it's important to dispose of the highest amount of information to reduce it. Basically the difference between risk and uncertainty lays in the possibility to associate a probability of occurring to the various events: we can consider risk as "*quantifiable measure*" and uncertainty as "*unquantifiable measure*".

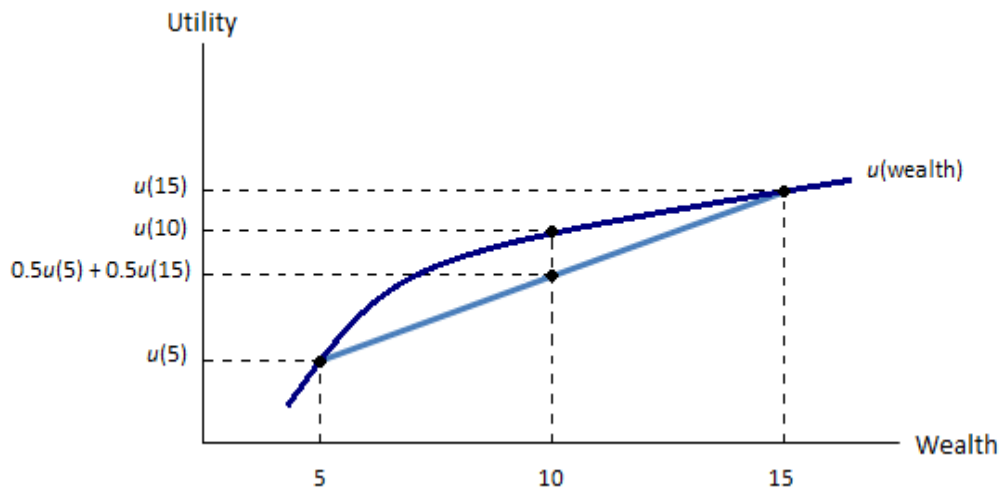
In the real world the only certain piece of information we can have is our current

situation, which may be subject of an indefinite number of variables entailing unpredictable outcomes; there are often situations whereby consequences of a decision don't depend on who makes that decision but on the happening (or not) of certain uncontrollable events. Individuals don't behave the same way when they have to face risk, their attitudes and choices may vary according to economic, social or institutional factors. Let's now apply the Expected utility model to a simple problem of choice to explain how people approach risk in different ways.

Let's suppose that a customer owns € 10 and he is considering to invest it in a risky activity (such as a lottery) offering a 50% probability to earn € 5 and 50% to lose € 5. His final wealth will depend on an aleatory element: he could dispose of € 15 with a probability of 50% and he could end up to have € 5 with the same probability. The expected value of this bet is € 10 and the Expected utility function is

$$0.5u(€ 15) + 0.5u(€ 5)$$

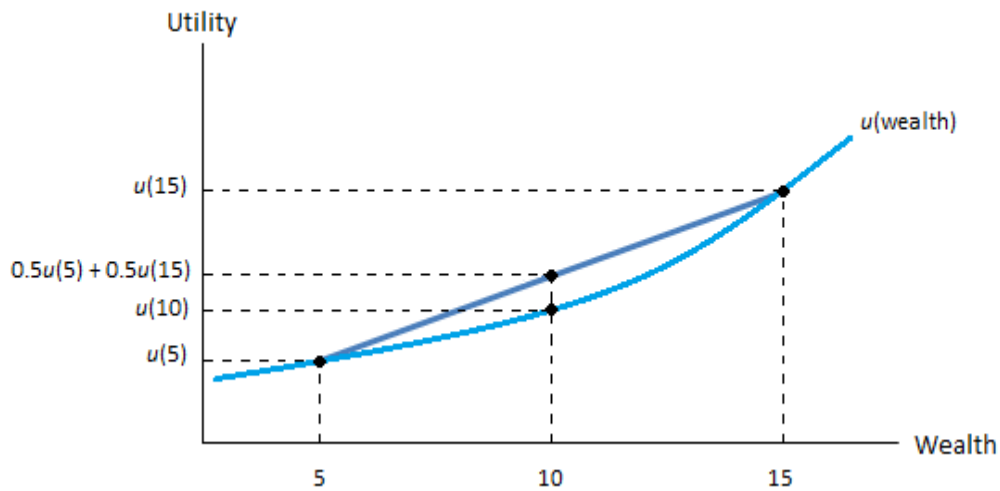
This is showed in the following picture; the expected utility of the wealth is the mean between $u(€ 15)$ and $u(€ 5)$, represented in the graph by $0.5u(5) + 0.5u(15)$. The utility of the expected value of the wealth is instead $u(10)$, which is bigger than the expected utility of the wealth.



Risk aversion utility function

In this case we say that the customer is **risk adverse**, because he prefers to dispose of the expected value of the wealth rather than taking the risk of the bet. For a risk adverse customer the utility of the expected value of an amount of money is bigger than the expected utility of the same amount of money.

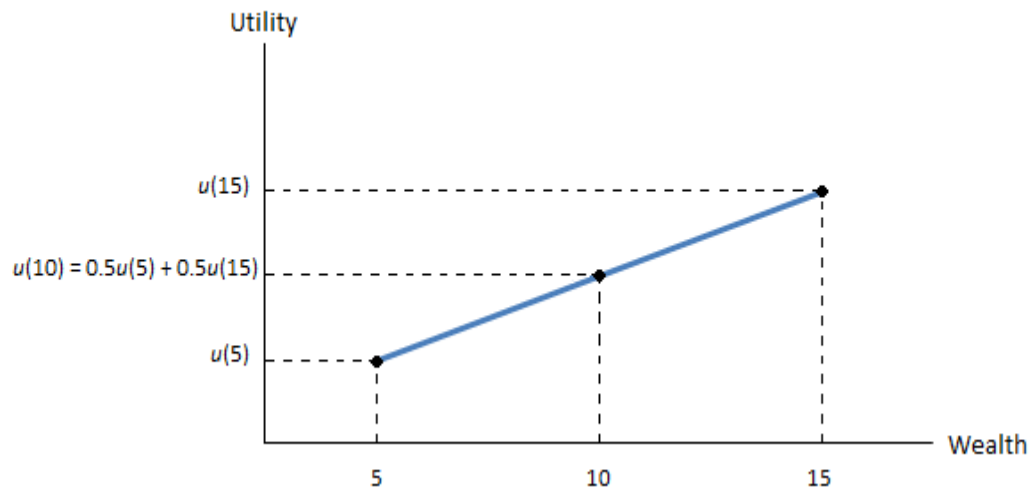
Obviously, personal tastes and different attitudes can make a customer prefer an aleatory distribution of the wealth rather than its expected value: in this case we say that the individual is **risk lover** or **risk seeker**, as represented in the following graph. Here the expected utility of the wealth $0.5u(5) + 0.5u(15)$ is bigger than the expected value $u(10)$.



Risk seeking utility function

It's important to notice that the utility function of the risk adverse customer is concave, thus the more the level of wealth increases, the flatter it becomes. The utility function of a risk lover is instead convex: the more the level of wealth increases, the steeper it becomes. The curvature of the utility function shows the risk attitude of the individual: the more it is concave, the more the customer is risk adverse; the more it is convex, the more the customer is risk seeking.

The middle case is represented by a linear utility function: here the customer is indifferent about risk and the expected utility of wealth is equal to the utility of its expected value. In this case the consumer is indifferent between the certain alternative and the risky one. He is not interested in the risk of the bet, but only in its expected value.



Risk indifference utility function

4.3. Risk, insurances and lotteries

Experience teaches us that in general consequences of our choices are not perfectly known in advance at the moment of the decision: the uncertainty can depend on various circumstances. Anyway the problem of choice can be set up in a simplified way. First of all the various sources of uncertainty can be brought back to the unique general case whereby the consequences of our choice are uncertain. Furthermore the different forms of uncertainty can be represented in terms of risk over the monetary sum we could get after having relinquished something with a certain monetary value. That means that we can think of a decision under uncertainty as a choice among different lotteries. If we accept the proposed simplification, the mere activity of choice in a world signed by uncertainty is nothing but choosing among different alternative lotteries, each with different characteristics, which are the price of participation and the potential prizes. At a first sight it could appear that the

comparison among the various lotteries may be done on the basis of the only expected monetary values: a higher expected monetary value (and so an higher winning expectation) should be preferable. Despite this, we have already observed that risk propensity represents an important evaluation criterion. Some cautious people could prefer a lower expected monetary value, if the risk is modest, while some others could love hazard. Let's consider the following example, initially proposed by Bernoulli himself.

The individual A is poor but he owns a lottery ticket with a 50% probability to win € 20.000 and a 50% probability of receiving nothing. The expected monetary value is so € 10.000. But are we sure that individual A's ticket is really € 10.000 worth and that he should turn off if someone would offer him € 9.000 to buy it? Definitely not, because it's more likely that A derives more utility from certain € 9.000 than from a lottery ticket with an uncertain outcome. On the other hand, are we able to demonstrate to an individual B who is instead very rich that it would be wrong to purchase that ticket for € 9.000? Even in this case the answer is no, because the idea of having a certain € 9.000 for a rich person could be less attractive than the perspective of earning more than its double with 50% odds. Thus the expected value of € 10.000 doesn't coincide with any of the two cases proposed; that's because A and B may have different opinion and attitudes about the outcome that can occur. According to Bernoulli the relative evaluations depend on personal circumstances and economic conditions which in this case are represented by the individual heritages. Who is poor gives more importance to a sure value, while who is richer pays more attention to how much he could gain because he can absorb the possible loss with any problems. This principle can be applied also in the market of risk (insurances); the individual A buys an insurance from B: the last receives a certain

sum (the prize) and he committees to offer an uncertain amount of money (the reimbursement for a possible damage)⁴. Generally, it's possible that a risk can be considered reasonable by someone or disadvantageous by other people. We can derive that a subject adverse to risk may prefer to ensure even if the prize to pay is higher than the refund in case of accident, multiplied by the probability to occur (also known as *fair prize*). What matters for him is in fact the expected utility rather than the expected value, and the former can be bigger than the one he would have without insurance. An individual who prefers not to ensure, after an evaluation of his perspectives according to the Expected utility theory, is a risk lover. On the other hand, if nowadays a lot of people bet and buy lottery tickets (which are never fair), according to the expected utility principle, these people are risk lovers too. It's important to underline that these considerations deriving from the Expected utility theory are assumed for hypothetical rational people, but in reality individuals don't behave this way, because their judgements are influenced by psychological and emotional components⁵. This reasoning is even more accentuated in pathological gamblers: in fact they constitute a separated category given that their disease makes them not able to evaluate rationally economic choices according to the Expected utility criterion.

4.4. The St. Petersburg Paradox

The St. Petersburg Paradox describes a particular game related to probability and decision theory in economics. This games consists in a peculiar lottery based on a

⁴ Source: M. Li Calzi – *La matematica dell'incertezza*; (2016)

⁵ Source: M. Friedman, L. J. Savage – *The utility analysis of choices involving risk. The journal of Political Economy*; (1948)

random variable with infinite expected value (infinite payout), that is an average win which is infinitely worth. Nevertheless, people seem to be willing to pay only a minimum stake to participate to the game. The paradox is a typical situation where the direct application of the decision theory (which only considers the expected value) suggests a behavior that no reasonable man would adopt. The paradox was formulated by Nicolas Bernoulli⁶ in 1713 and then solved by various mathematicians, among which Daniel Bernoulli in 1738. Let's explain the paradox in details.

A casino (i.e. the St. Petersburg casino, here the reason of the paradox name) offers a hypothetical game of chance that requires a certain stake A to take part, in which a fair coin is tossed at each stage. The initial jackpot for the single player is 2 dollars and it doubles every time head appears. The first time tail appears, the game ends and the player wins whatever is in the pot. So the player wins 2 dollars if tail appears on the first toss, 4 if head comes out on the first toss and tail on the second, 8 dollars if head comes out both in the first and in the second tosses and tail appears on the third, and so on. Basically the player wins 2^k dollars, where k is equal to the number of flips (k has to be a whole number, greater than 0). So at the end of the tosses the player is sure to win a prize, but what would be a fair stake A to pay the casino for taking part to the game?

To find the answer we need to consider the average payout: the expected value is thus:

$$\begin{aligned} EV &= \frac{1}{2} * 2 + \frac{1}{4} * 4 + \frac{1}{8} * 8 + \frac{1}{16} * 16 + \dots \\ &= 1 + 1 + 1 + 1 + \dots = \sum_{k=1}^{\infty} 1 = \infty \end{aligned}$$

⁶ Nicolas Bernoulli (1687-1759) was a Swiss mathematician, cousin of Daniel Bernoulli.

Supposing that the game can go on as long as the coin flip results in head and that the casino has unlimited resources, the sum grows infinitely and so the expected win tends to infinite. Consequently, according to the traditional expected value theory, the player can afford to play every amount of money A to take part to the game. In fact also by betting a billion per time, in the long run it will occur the time when he will win such a big prize to remunerate all the money invested to have irrelevant wins.

However in reality no reasonable person would be willing to pay more than a few dollars to play this game: the paradox lays so in the discrepancy between what people are actually willing to pay to enter the game and the infinite expected value. Various approaches have been proposed for solving the paradox, among which the Expected utility theory. For sociologists and economists the paradox constituted a powerful stepping stone to the formulation of an expectation theory and to introduce concepts of marginal utility and subjective weight attributed to probabilities. The classical resolution of the paradox proposed by Daniel Bernoulli involves a common utility model, such as the logarithmic function $U(w) = \ln(w)$, which represents the gambler's total wealth w , and the concept of diminishing marginal utility of money is included into it. This approach suggests a much lower expected utility and a determined price to avoid the paradox of an endless game, given that it abandons what was considered the milestone of utility functions: positive linear functions. Ten years before Daniel Bernoulli's resolution, also Gabriel Cramer⁷ had already realized part of this idea, explaining that:

"Mathematicians estimate money in proportion to its quantity, and men of good sense in proportion to the usage that they may make of it".

⁷ Gabriel Cramer (1704-1752) was a Swiss mathematician, professor of Math and Philosophy at the University of Geneva.

4.5. Gambler's Fallacy

The gambler's fallacy (also called Monte Carlo Fallacy or Fallacy of the maturity of chances) is a logical mistake concerning the belief that past events have an influence over future events in activities regulated by chance. More precisely, the expression describes one of the following wrong beliefs:

- A random event has more chances to occur because it hasn't occurred for a certain period of time;
- A random event has less chances to occur because it hasn't occurred for a certain period of time;
- A random event has more probabilities to occur because it occurred recently;
- A random event has less probabilities to occur because it has already occurred recently.

In situations where what is item of interest is truly random, this belief is false, even though it could be appealing to the human mind. The fallacy can develop in numerous practical occasions concerning probability calculation, but it is called Gambler's fallacy because these kind of mistakes are frequent among players. Gambler's fallacy can be exemplified thinking about the toss of a coin. Using a fair coin, the probability to obtain heads is 0.5 (1 out of 2), the probability to obtain heads twice in a row is 0.25 (1 out of 4), the probability to have heads three times in a row is 0.125 (1 out of 8) and so on. Now suppose that we have just flipped 4 heads in a row. An individual affected by gambler's fallacy could say:

"If the next flip a head appeared, there would be a succession of 5 heads in a row. The

probability of having five heads in a row is $\left(\frac{1}{2}\right)^5 = \frac{1}{32}$; so there is only one chance out of 32 to have a head in the next toss."

This is a wrong reasoning, because if the coin is fair the probability of having tails must always be 0.5 (never bigger or smaller), just like the probability of having heads. The odds of having five heads running is $\frac{1}{2}$ only before the first toss of the coin. After four tosses the results are no more unknown, so the calculation of the next outcome must not include them. The probability of having five heads in a row is the same of having 4 heads running and a tail. The odds of 1 out of 32 was based on the assumption that heads and tails are equally likely in each of the five tosses. Believing that in the next flip heads is more likely is a mistake deriving from the idea that having been lucky in the past influences somehow the outcomes of future events.

Analyzing a video recorded in the casino of Reno, Nevada, some researchers demonstrated that when playing roulette, people tend to bet on black if the ball has just ended up on red four times running⁸. An analogue example is represented by the tendency of people to bet on laggard number on Lotto game. Some of them also elaborate peculiar "systems" allowing them to understand the trend of a game of chance, forecasting the next outcomes and beating the house and the other opponents. Obviously these improvised methods are totally wrong but some gamblers are blind in front of probability theory and this affects the amount and the frequency of their bets. In situation signed by uncertainty, gambler's fallacy tends to prevail. The fallacy originates from the wrong mental representation people have about a mechanism entirely regulated by chance: the probability of a particular outcome is

⁸ Source: <http://www.ilpost.it/2016/03/10/non-capiamo-le-probabilita-ed-e-un-problema/>

always the same at every turn of roulette, but we are anyway attracted by those numbers making them desirable for a long time. This logical mistake can affects everybody, not only pathological gamblers. It's quite worrying that this form of superstition undermines people's capability of judgment in taking important decisions, individuals who are apparently reasonable and intelligent and who own a significant influence also on others' lives.

5. Taxes and fees: the impact of gambling on Italian tax revenue

In the last five years gambling industry has been item of numerous legislative policies aimed to an increase of revenues, to the protection of under-ages, to the fight against pathological gambling and illegal market. To understand the data we are going to analyze, that clearly indicate how much the gambling sector affects the State's revenue, it's important to define a brief sight of the whole tax revenues: in 2015 and in 2016 the total of tax revenue was respectively € 436 billion and € 452 billion, accounting for a tax burden equal to 43,8% and 42,9% of Italian GDP¹.

Generally taxes are divided in two main categories: direct and indirect. The former concern immediate manifestation of productivity such as income and heritage. The aim of these taxes is to redistribute wealth among people, so the State tries to reach a better equity through them. Direct taxes accounted for more than a half the whole tax revenue (€ 246 billion in 2016). Indirect taxes instead concern wealth manifestations through the consumption or purchase of goods. Taxes on games belong to this category and they represent the 6th indirect tax for relevance (accounting for 0,72% of Italian GDP). In 2016 indirect taxes accounted for € 206 billion.

The key function of the just mentioned tax system is to guarantee the pursue of a better fairness within the country. The paradox related to gambling is represented by two elements: the first is the composition of gamblers, given that this activity is

¹ Source: Bollettino entrate tributarie 2015, 2016 available on http://www.finanze.gov.it/export/sites/finanze/it/.content/Documenti/entrate_tributarie_2016/Bollettino-entrate-Dicembre_2016.pub.pdf

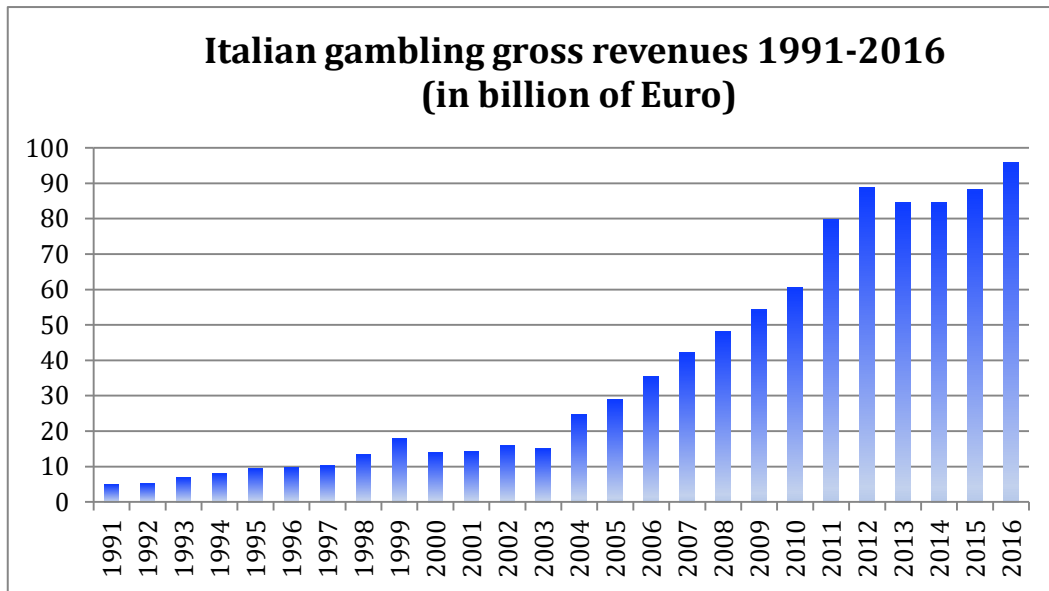
spreader among the less wealthy classes of population; the second is the system of game, that gathers little (bets collected) from a lot of gamblers to eventually give back too much (prizes for winnings) to very few winners.

5.1. Historical trend of Italian gambling business

Gambling sector has been subjected to an important slowdown over the last years: after a growing phase the business has entered a relatively stable period started in 2012 for what concern the gross revenues and in 2009 for the tax revenue, that's the profit for the State. Analyzing 2016 data it's evident the stillness of the current situation that, despite a slight growth over the previous year, it seems to have reached the total saturation. Players are now more oriented towards games with higher odds of winning and higher payouts. Consequently an enlargement of games supply in this scenario wouldn't imply an increase in both gross and tax revenues. The eventual increase in revenues deriving from the introduction of a new game will be equal to the reduction of revenues related to the other games, because they are substitute goods. Moreover, the shift of a player from a game to another will happen only if the new game offers more convenient conditions for the player himself, that entails almost always a lower income for the state. Despite the offer of games has varied many times over the last two decades, it's possible to split out the gambling market trend in three main phases:

1. 1991-2004, unstable and up and down phase;
2. 2004-2010, phase of growth, development and consolidation;
3. 2011-2016, current phase, mainly static.

The graph below shows an overview of data related to the gross revenues of the gambling industry in the last 25 years.



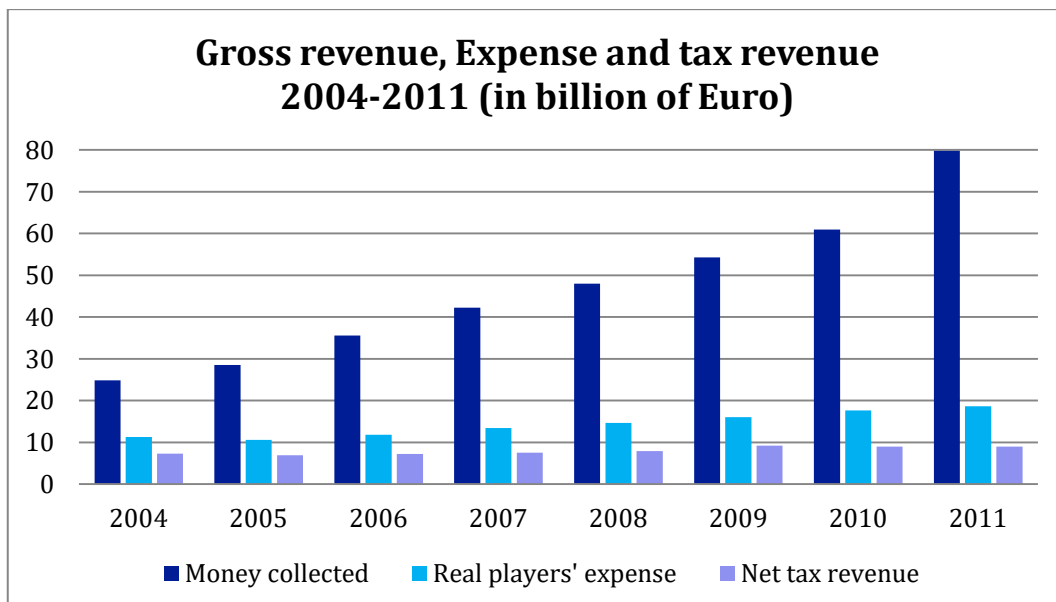
Source: Personal elaboration of game collection data available on AAMS website

5.1.1. Until 2004

The graph confirms that the evolution of gambling industry began in 2004. Anyway it's important to underline that these data are only in part meaningful, because they represent only the gross taxable amount and not the income, deriving by the subtraction of players' wins from the whole money collected. The reason of this sudden growth is due to the radical changes applied in the previous years both by government and distributors. At the heart of the rise of money collected there is in fact the introduction of a logic and new managerial methods aimed to raise the demand in two ways: by making emerge sectors still rooted in illegality and by widening the whole offer of games available.

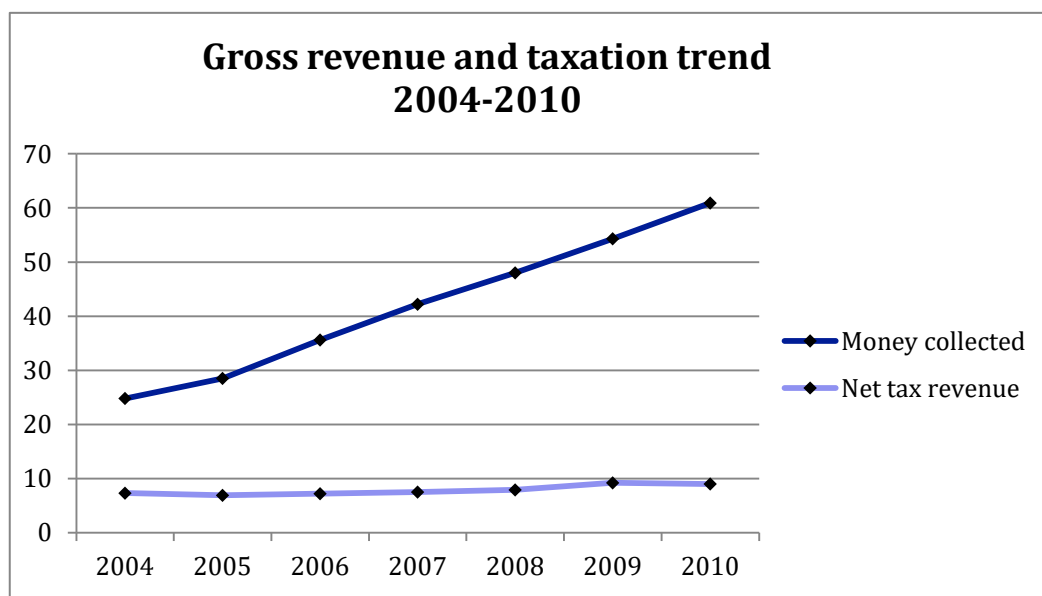
5.1.2. 2004-2011 Period

2004 is acknowledged as the real revolutionary year of the Italian gambling industry. The two policies at the basis of the development process are perfectly represented by the example of slot machines. These devices have deeply changed the market since the day of their introduction, assuring a relevant increase of the demand year by year. Another key factor of this positive trend lays on the success of Lotto game that in 2004 registered a record sales revenue for an amount of € 11 billion, well above the current trend of this game, considering also the numbers registered in 2015 and 2016, with just 7 and 8 billion of Euro collected. Results obtained thanks to this radical change in managerial practices, thanks to slot machine legalization and to Lotto exploit are outstanding: the net tax revenue doubled from € 3,5 to 7,3 billion, and also the gross collection increased at the same time, reaching 24,8 billion (from 15,1 billion in 2003).



Source: Personal elaboration of game collection data available on AAMS website

The new income registered in 2004 allowed the sector to definitely develop through the consolidation of tax revenue: the system changed from a situation characterized by uncertainty to a solution of continuity and structuralism. The following years confirmed a constant growing trend of gross revenues, carrying on until 2010 and beyond reaching € 79,8 billion in 2011 and € 88,6 billion in 2012. By analyzing the trend of players' expense (which represents the real income of the business, excluding taxation) we can notice a similar growth shifting from 11,3 billion of Euro in 2004 to 18,5 billion in 2011. Despite the increase of tax revenue, its growing path is notably lower than the one of gross revenues and player's expenses. Apart from the record doubling of 2004, tax revenue increased in a proportion (152,6% between 2003 and 2010) that is half the pace of gross revenues (306%). Unlike gross revenue and players' expense, tax revenue started to suffer a period of stagnation in advance, in 2010. In fact the value reached in 2009 of more than 9 billion of Euro still remains the highest ever, just behind the one of 2016 (€ 10 Billion).



Source: Personal elaboration of game collection data available on AAMS website

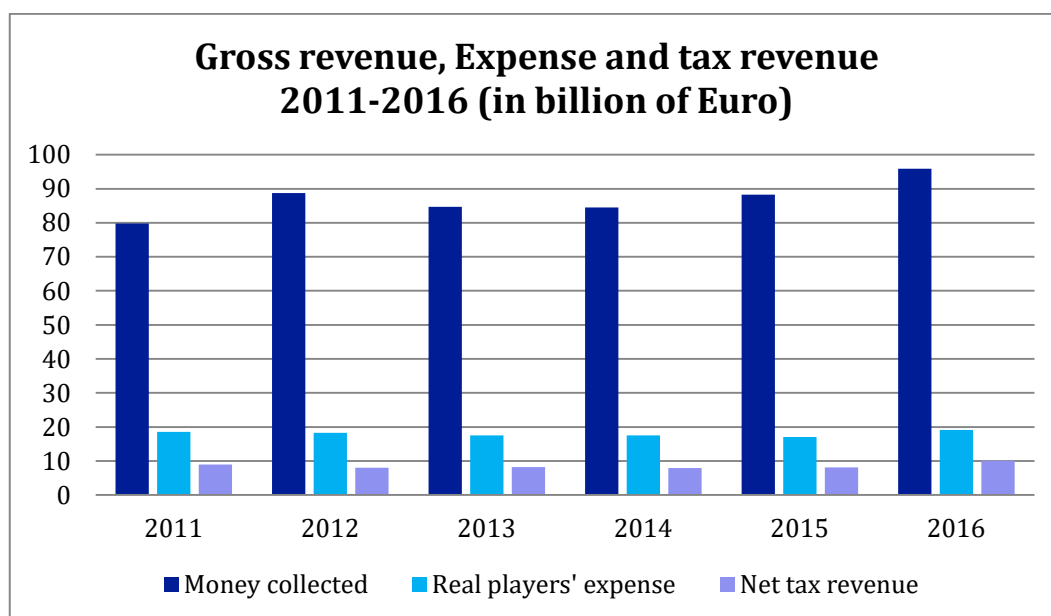
The incidence rate of tax revenue on gross revenue confirms this difference: it slumped from 30,3% in 2004 to 14,2% in 2010. The main reason of this different trend is constituted by the introduction of new, more convenient games that, thanks to their higher probability of win and lower tax rates, have made gamblers more selective and conscious of which were the games with the highest payout. This change is due to the so called substitution effect caused by the increase in tax rates over traditional games: the substitution effect states that an increase in the price of a good (for instance due to taxation) will encourage consumers to buy alternative cheaper goods. The substitution effect measures how much the higher price encourages consumers to buy different goods, assuming the same level of income². The rise of taxation over traditional games brought to a decrease of the yield deriving from them and to a shift of players from these games (such as lotteries, Lotto and games with totaliser) to slot machines and fixed rate betting. It's emblematic the evolution of slot machine sector, that in 2004 accounted for 7% of the whole gross revenue and in 2015 it reached a share of 54,5%.

5.1.3. 2011-2016 Period

In the period 2010-2012, while the growth of money collection reached its peaks overtaking € 88,6 billion, tax income suffered a slight drop accounting for € 8,3 billion in 2012. The situation of net tax income, after having reached the highest value in 2009, remained steady for the following 5 years, as observable in the following graph, sticking around an average amount of 8 billion of Euro. The money collection after the peak of 88,6 billion has stayed static in a scissor between 84,4

² Source: H. Rosen, T. Gayer, McGraw Hill - *Scienza delle finanze*; (2014)

billion and 88,2 billion until 2015. Only in 2016 we register a slight increase in values, but it is still a low growth if compared with the growing pace of the period 2004-2011, witness of a saturation of the market.



Source: Personal elaboration of game collection data available on AAMS website

In the current scenario slot and VLT are the primary source of the revenues, accounting for more than a half of it, followed by Lotto and lotteries and card games. Just like the demand, also the supply of games has been stable over the last years. So the analysis of these graphs confirms the limits of the expansion of a sector that only 10 years ago seemed to be unstoppable.

5.2. Types of taxes

Taxes are subdivided in two categories: per unit taxes (or specific taxes) and ad valorem taxes. Per unit taxes are peculiarly calculated in relation to the quantity of

the taxable output. A classical example of them are excises on fuel and alcohol. The taxable amount of a specific tax is represented by the physical quantity of a product, expressed in suitable units of measurement (i.e. € / liter).

The other category is formed by ad valorem taxes: an ad valorem tax (Latin for "*according to value*") is a tax whose amount is based on the monetary value of a transaction or of property. An ad valorem tax increases proportionally to the taxable base: it's so applied with a fixed tax rate. It is typically imposed at the time of a transaction, as in the case of a sales tax or value-added tax (VAT)³.

In the case of gambling, the specific tax is applied in a fixed percentage, having as taxable base the amount of money collected, without considering the wins of players. The State so absorbs a fixed amount of money out of the whole quantity of purchased bets. The consequence is that the tax is composed by a fixed sum on every unit of bet played. If otherwise the taxable base was the difference between money collected and wins distributed to players, it would be an ad valorem tax: the taxable base would be constituted by the gross margin of the bet, that's its price.

Despite in a market characterized by perfect competition the difference between specific and ad valorem taxes is irrelevant, since we shift to a not perfectly competitive market, this difference assumes an important meaning. In fact in a perfectly competitive market the market balance is characterized by the same price and the same quantity. So a proportional taxation would be equivalent to a specific taxation, because there would be no difference in applying a 10% tax rate per every Euro of output or applying 10 cents. This peculiarity makes sure that there are no variations in tax revenue when changing from a tax system to another.

As said before, the situation changes radically when we move to a not perfectly

³ Source: H. Rosen, T. Gayer, McGraw Hill - *Scienza delle finanze*; (2014)

competitive market, such as gambling. This market is so far from the ideal competitive market, because goods are not perfectly substitutable, there are solid entry barriers and there is an important information asymmetry for the players. Entry barriers can be economical (related to the enormous capital fund needed to invest in the sector) and administrative (related to licenses and authorizations conceded exclusively to very few concessionaries). Information asymmetries instead consist in the unfair relationship between consumers and operators. In fact it's necessary a deep knowledge of probability theory to compute the expected value of a possible game, that not every person disposes and that is not expressed explicitly by games managers. This bunch of factors makes the gambling market tend to a condition of legalized monopoly, where the economic operator is authorized by law to run exclusively his own economic activity.

An ad valorem tax on price in a not competitive market stimulates companies to maximize their profits through lower unit margins balanced by higher quantity sold. On the other hand a specific tax boosts unit margins to grow, while the quantity decreases. Type of tax imposition and state of the market are deeply related. The tax system adopted in a certain market affects also the capability of operators to react to possible shocks and alterations of externalities.

An ad valorem tax system guarantees firms a higher capability of adaptation in front of increases of competition such as those deriving from international companies. If an increase of competitiveness occurs, a reduction of the price of bets is immediately accompanied by a reduction of the fiscal burden, given that the taxable base would be constituted by the gross margin, that's the price of the bet. If the price goes down also the tax per unit decreases but not necessarily also the whole tax revenue for the

State does. There would be more aleatoriness of income for the state because there is the possibility that the sales volumes remain unvaried in case of price reduction.

With a specific tax instead, the taxable base would be constituted by the whole gross revenues and a reduction of price due to an increase of competition would entail a more than proportional decrease of the concessionary's margin, given that at the same level of collection the taxation remains the same, while the margin decreases. For sure this last type of taxation is more stable and reliable for the State, at least in the short term, because it doesn't depend on price policies that concessionaries may decide to adopt.

To solve the problem of tax revenue stability and to know deeply the effects of a transition from a tax type to another is necessary to know the behavior of sales volume after a variation of the price of the bet. To do it it's necessary to calculate the elasticity of the demand on price. The international literature shows that in some countries such as UK and USA, the elasticity of gambling market has always been higher than 1. Also some studies conducted by CASMEF⁴ about lotteries market reported a result well above the value of 1⁵; these data suggest that in case of adoption of a taxation on gross margin there would be a compensation of tax revenue loss, through an increase of money collected, due to a price reduction.

⁴ Centro Arcelli per gli Studi Monetari e Finanziari

⁵ Source: http://www.gioconews.it/attachments/31002_L'IMPRESA%20DEL%20GIOCO.pdf

5.3. Current tax framework

The motivation having boosted the government to constantly improve the revenues deriving from gambling lays in the principle of multiplicity of withdrawals. According to this principle, every tax system is never constituted only on a single form of revenue and, thanks to the plurality of sources it is possible to have a better tax fairness. Obviously not all the taxes have the same burden. In the last year the most important taxes, IRPEF (direct) and VAT (indirect) accounted together for 67% of the whole tax revenue⁶. Games taxation is one of the minor taxes but its role always arouse great attention. It accounts for 3% of the total of tax revenue.

The normative framework that regulates gambling sector is very complex, also because law dispositions refer often to AAMS's decrees. We can divide tax revenue of this industry in two categories:

- Extra-tax revenues: the collection is reserved to AAMS which applies it directly through authorized concessionaries, by getting directly the money collected, after prizes are paid to winners and after remunerations are given to sale points directors. Lotto, lotteries and Bingo belong to this typology.
- Tax revenues: they comprise tax revenues related to all the other games, which are taxed with different modalities and at different rates. The PREU (Prelievo Erariale Unico), instituted in 2003⁷, is aimed to tax slot machines activity. The last update of PREU concerns the adjustment introduced with the Stability Law 2016. Here the percentage of withdrawal for the State has

⁶ Source: Bollettino entrate tributarie 2015, 2016 available on http://www.finanze.gov.it/export/sites/finanze/it/.content/Documenti/entrate_tributarie_2016/Bollettino-entrate-Dicembre_2016.pub.pdf

⁷ DL 269 2003, art 39 comma 13

been fixed at 17,5% for newslots (AWP⁸) and at 5,5% for Video lotteries (VLT). The real turning point of gambling taxation happened in 1997 with the adoption of the *single tax* (imposta unica): it is used to tax the activity of all the games apart from those making part of extra-tax, slot machines (VLT and AWP) and other gaming machines which have the only aim of entertaining and don't contemplate money prizes (such as flipper or table soccer) and that are taxed through ISI and VAT. Starting from October 2011 a new tax on wins has been introduced: it consists of a 6% taxation over wins higher than € 500 related to VLT, Gratta e Vinci, Superenalotto and Win for Life⁹.

The Stability law of 2016 has represented a revolution in the introduction of the concept of margin as tax base, both for fixed rate sports betting and remote skill games, since 1st January 2016. The following chart summarizes the tax base and the tax rate for each type of gambling according to the Stability law 2016.

Current tax framework of Gambling (2016)

GAMES	TAX TYPOLOGY	TAX BASE	TAX RATE	6% for wins > €500
LOTTO				
Traditional Lotto	Extra-tax revenue		Differential for the house	No

⁸ AWP (Amusement with Prizes)

⁹ D. dir.prot. 2011/DL n. 138 2011

10 e Lotto	Extra-tax revenue		Differential for the house	No
NUMERICAL GAMES WITH NATIONAL TOTALISER				
Superenalotto	Single tax	Gross revenues	53,62%	Yes
Superstar	Single tax	Gross revenues	38,27%	Yes
Win for Life	Single tax	Gross revenues	23,27%	Yes
LOTTERIES				
Traditional Lotteries	Extra-tax revenue		Residual value	No
Gratta e Vinci	Extra-tax revenue		Residual value	Yes
SPORTS BETTING				
Sports and no sports betting at fixed rate	Single tax	Margin on sums not given back to players	18% offline; 22% online	No
Betting with totaliser	Single tax	Gross revenues	20%	No
HORSE RACE BETTING				
National horse racing	Single tax	Gross revenues	6%	No
Horse race bets	Single tax	Gross revenues	15,7%	No
V7	Single tax	Stake	15%	No
BINGO	Extra-tax revenue	Selling price of cards	11%	No
GAMING MACHINES				
Slot machines (AWP)	PREU	Total gross revenues	17,5%	No
Video Lottery (VLT)	PREU	Total gross revenues	5,5%	Yes
Machines for entertainment without money prize (comma 7)	ISI and IVA(VAT)	Average annual taxable income for category	8%	No

REMOTE SKILL GAMES	Single tax	Margin on sums not given back to players	20%	No
CARD GAMES AND GAMES OF CHANCE AT FIXED RATE				
Poker cash	Single tax	Concessionary's gross margin	20%	No
Casino games	Single tax	Concessionary's gross margin	20%	No

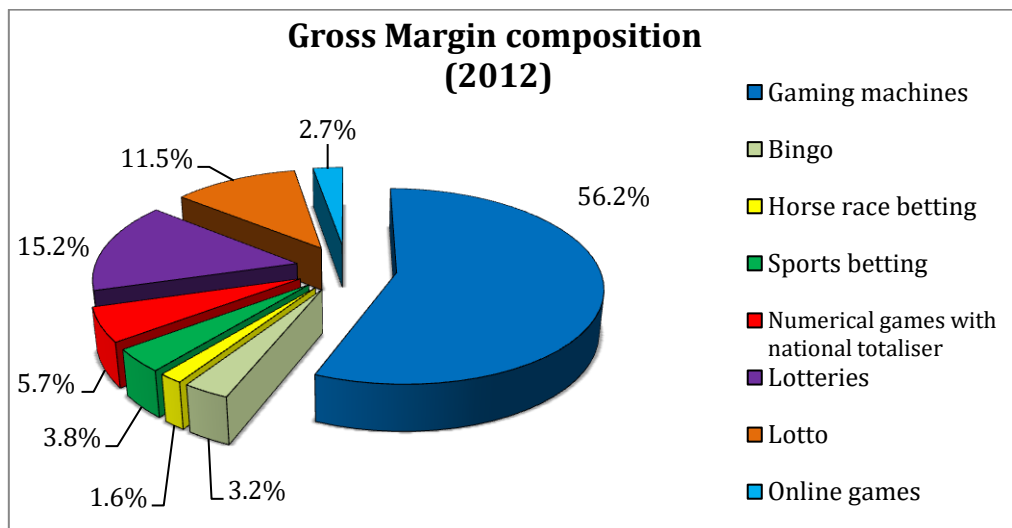
5.4. Analysis of taxation in the period 2012-2016

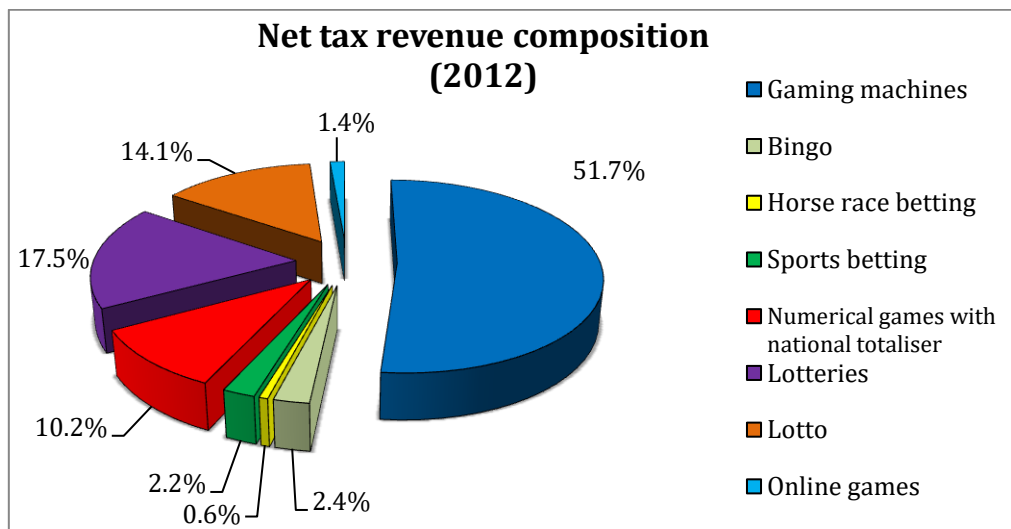
The following charts gather all the numbers related to gross revenues, income and tax revenues for every gambling sector over the last five years. All the data are available on the official website of AAMS. The related pie charts help to understand what is incidence of every game on the total gross margin and in which measure they contribute to the net tax revenue (according to the dispositions of the Stability Laws of the last years).

Sales Volumes and Tax revenues in 2012 (in million of Euro)

GAME	Money Collected	Players' wins	Total players' losses	Net tax revenue
Slot machines	27.420	20.733	6.687	3.236
VLT	22.344	19.046	3.298	894
Other gaming machines (Comma 7)	302	-	302	24

Bingo	1.763	1.185	578	194
Horse race betting	1.011	712	299	48
Sports betting	3.995	3.295	700	177
Numerical games with totaliser	1.779	740	1.039	816
Lotteries	9.764	6.977	2.786	1.406
Lotto	6.221	4.110	2.111	1.134
Remote skill games (Tournament)	1.256	1.110	147	38
Card games (Organized in different forms than tournament)	12.716	12.539	356	71
Virtual betting	-	-	-	-
Betting exchange	-	-	-	-
TOTAL	88.752	70.269	18.303	8.037





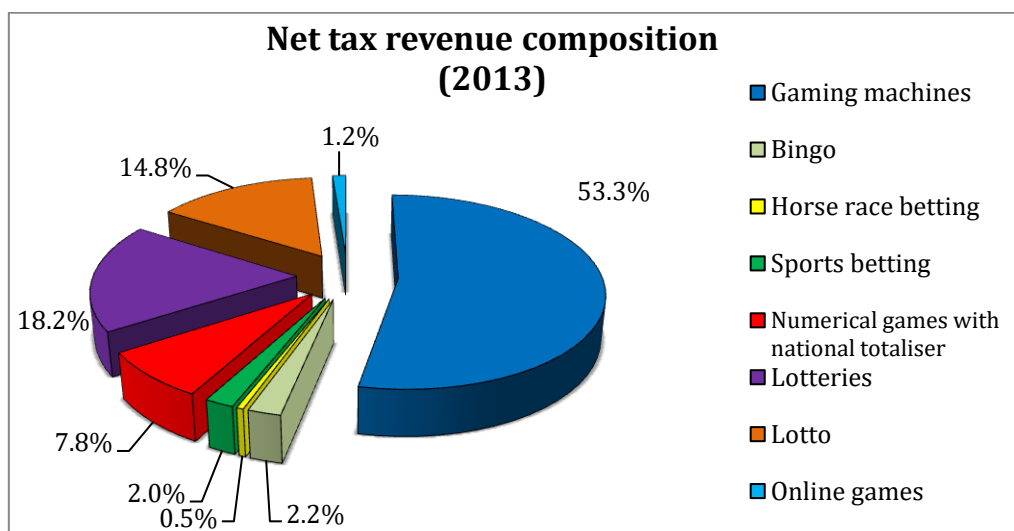
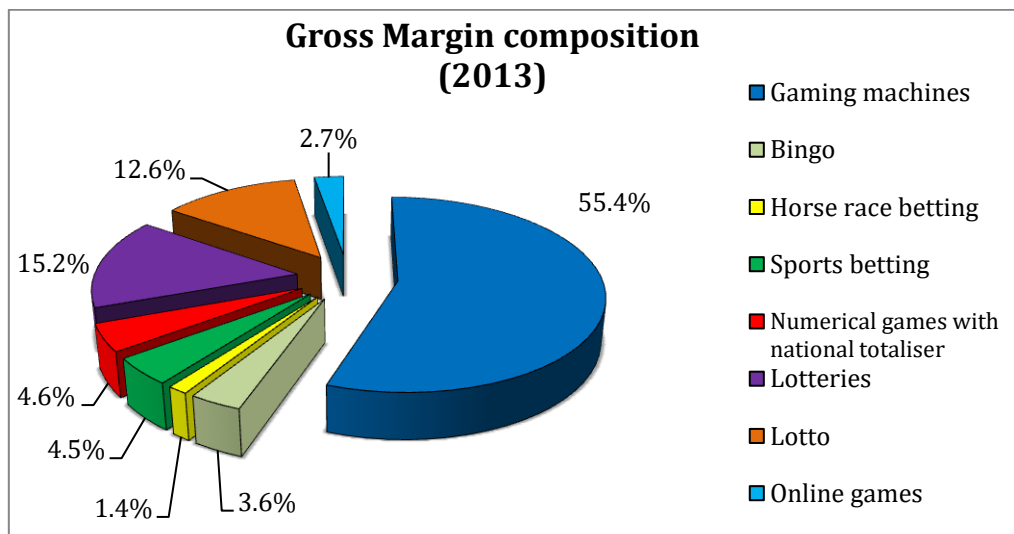
Source: Personal elaboration of game collection data of 2012 available on AAMS website

The starting year of our analysis is 2012. In this year the amount of money collected reaches its peaks, as well as the gross margin (while paradoxically the tax revenue is smaller than the one registered in 2009). It's evident how in this period the impact of gaming machines was already important, accounting for more than a half the gross revenues, as well as the gross margin and the net tax revenue. Lotteries and Lotto are the second and third contributors of tax revenues with shares of 17,5% and 14,1%. They contribute to tax revenue more than proportionally than to their gross revenues and gross margins. That depends on a taxation which encumbers on traditional games (including lotteries and Lotto) more than on the new games. The situation of numerical games with totaliser (including Superenalotto and Win for Life) is even more evident: their weight on tax revenues is twice their weight on the total of gross margin (10,2% against 5,7%). Even if the impact of the other games (sports betting, online games, bingo and horse racing) to the gross margin is just a marginal part, it's curious that their contribution on tax revenues is even lower. This

is proof of the fact that the taxation over these games is slighter than over traditional games.

Sales Volumes and Tax revenues in 2013 (in million of Euro)

GAME	Money Collected	Players' wins	Total players' losses	Net tax revenue
Slot machines	25.422	19.042	6.380	3.229
VLT	22.085	19.091	2.994	1.104
Other gaming machines (Comma 7)	303	-	303	24
Bingo	1.664	1.042	622	183
Horse race betting	813	572	241	39
Sports betting	3.822	3.041	781	162
Numerical games with totaliser	1.376	580	796	642
Lotteries	9.612	6.956	2.656	1.486
Lotto	6.333	4.128	2.205	1.210
Remote skill games (Tournament)	852	755	97	26
Card games (Organized in different forms than tournament)	12.429	12.052	377	74
Virtual betting	17	14	3	1
Betting exchange	-	-	-	-
TOTAL	84.728	67.273	17.455	8.179



Source: Personal elaboration of game collection data of 2013 available on AAMS website

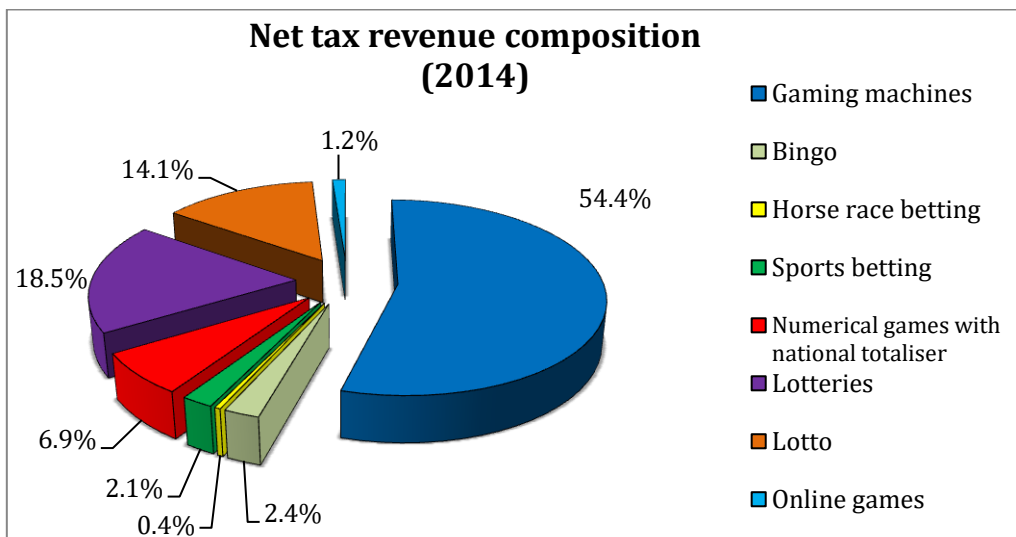
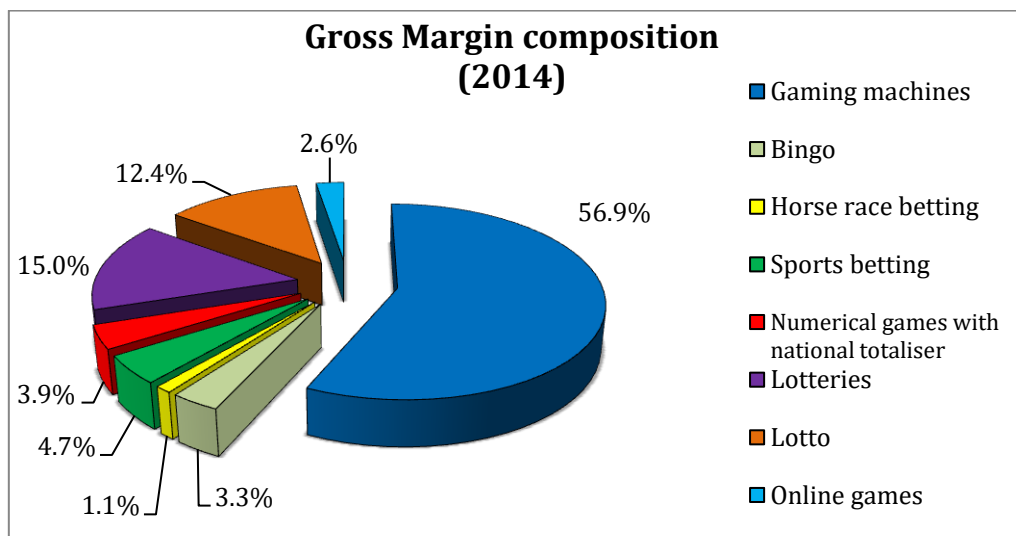
At the end of 2013 gambling industry registered gross revenues for 84,7 billions of Euro, with a decrease by 4,5% over the 88,7 billions of previous year. This result is emblematic because it's the first time in recent history that gambling suffers a decline in gross revenues, first symptom of a saturation of the market. Nevertheless, earnings for the State rose by € 1,5 billion, at a rate of 1,8%. This growth depended on some measures applied with the reform of 2012 (that will be explained in the next chapter), in particular the introduction of the 6% tax over wins higher than €

500. The main contribution on State's earnings was still kept by gaming machines with 53,3% of the total tax revenues composition. The real players' expense accounted for € 17,4 billion, with a 20,3% ratio over the whole money invested. The income for the State was almost € 8,2 billion, so the industry produced a net income of € 9,3 billion.

Sales Volumes and Tax revenues in 2014 (in million of Euro)

GAME	Money Collected	Players' wins	Total players' losses	Net tax revenue
Slot machines	25.382	18.942	6.440	3.224
VLT	21.388	18.195	3.192	1.069
Other gaming machines (Comma 7)	231	-	231	18
Bingo	1.624	1.044	580	190
Horse race betting	682	484	198	32
Sports betting	4.250	3.437	814	170
Numerical games with totaliser	1.188	506	682	549
Lotteries	9.441	6.833	2.607	1.462
Lotto	6.629	4.473	2.156	1.114
Remote skill games (Tournament)	734	655	79	22
Card games (Organized in different forms than tournament)	11.584	11.219	365	72

Virtual betting	1.148	963	186	37
Betting exchange	205	204	1	0,2
TOTAL	84.485	66.954	17.531	7.959



Source: Personal elaboration of game collection data of 2014 available on AAMS website

Let's analyze now the financial situation at the end of 2014. At the end of the year, gambling industry produced gross revenues for € 84,5 billion, with a very slight

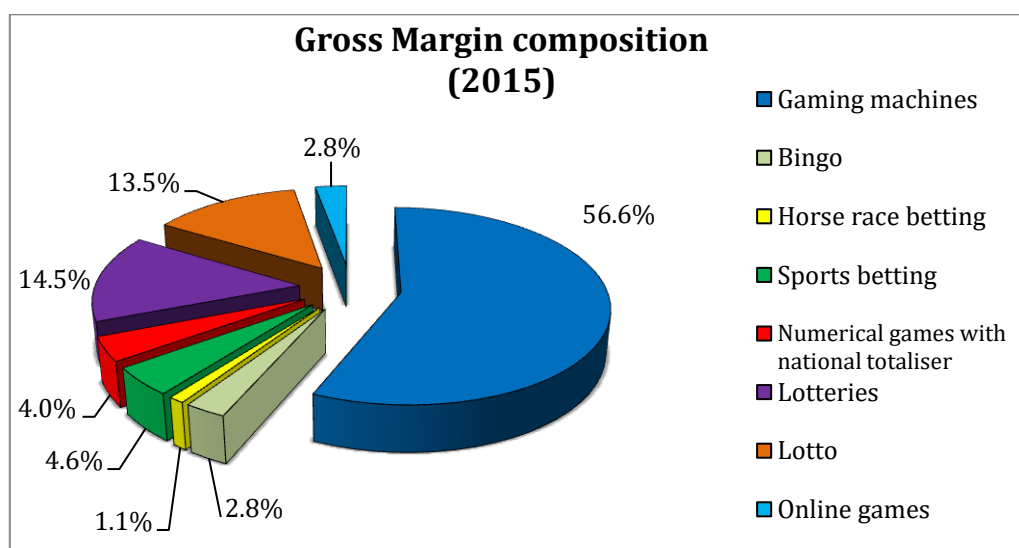
decrease (-0,29%) over the previous year. Just like gross revenues and gross margin, also tax revenues showed a slight drop (-2,5%) shifting from € 8,17 billion to € 7,96 billion. This is due to the fact that Italians are abandoning high-tax games in favor of low-tax games, preferring games such as sports betting and VLT instead of lotteries and slot machines. Preferences towards sports betting are witnessed by a +11,2% over the gross revenues of the previous year; also Lotto registered a positive trend (+4,7%) over 2013. On the contrary, horse races betting went down significantly (-16,1%) with a gross revenue of just 682 millions of Euro. Also slot machines and VLTs, despite their large market share, showed a (-1,7%) drop over 2013.

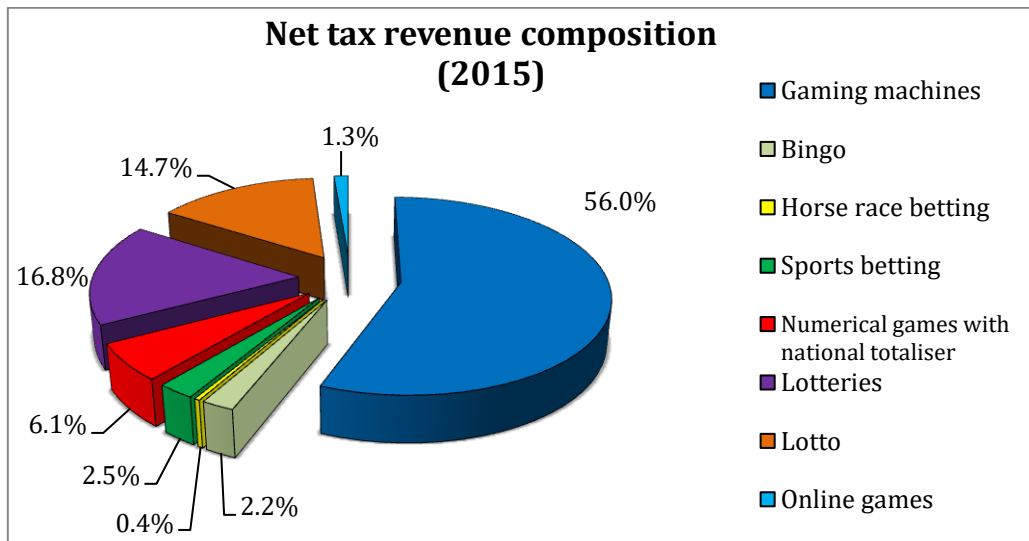
The best contributors to tax revenues in percentages were sports betting (+4,8%), and Bingo (+4,3%). Notwithstanding, their contribution in absolute terms was significantly lower (just 170 and 191 million of Euro, against 4,3 billion deriving from gaming machines).

Sales Volumes and Tax revenues in 2015 (in million of Euro)

GAME	Money Collected	Players' wins	Total players' losses	Net tax revenue
Slot machines	25.963	19.279	6.683	3.375
VLT	22.198	19.534	2.664	1.110
Other gaming machines (Comma 7)	230	-	230	18
Bingo	1.598	1.124	474	176
Horse race betting	636	455	181	30
Sports betting	5.592	4.807	785	203

Numerical games with totaliser	1.055	380	676	487
Lotteries	9.063	6.603	2.460	1.353
Lotto	7.077	4.794	2.283	1.179
Remote skill games (Tournament)	727	656	71	22
Card games (Organized in different forms than tournament)	12.502	12.091	411	82
Virtual betting	1.067	887	180	36
Betting exchange	541	538	3	0,5
TOTAL	88.249	71.147	17.102	8.071



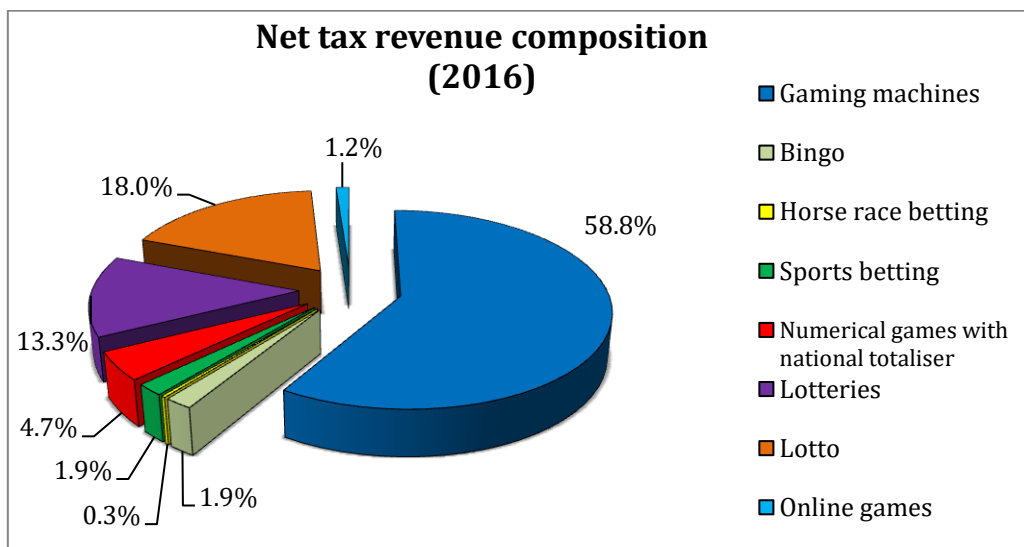
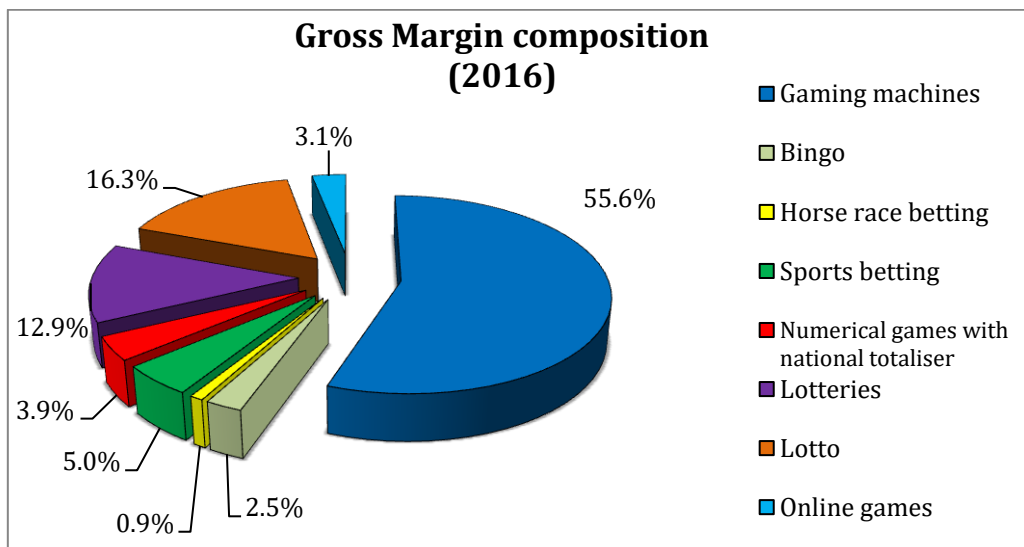


Source: Personal elaboration of game collection data of 2015 available on AAMS website

At the end of 2015 gambling industry registered positive results, showing a partial recover from the period of stagnation began after 2012. The gross revenues reached € 88,2 billion (second best outcome, just behind the peak achieved in 2012). Slot machines and VLT confirmed their supremacy over the other games (56,6% of the gross margin) and also their contribution on tax revenues increased (+1,6% over 2014). The real player's loss accounted for € 17,1 billion (-2,4% over 2014 loss): this means that money invested in gambling in 2015 were higher than those invested in 2014, but the relative loss for the players was lower. The outcomes of gaming machines, Lotto and sports betting were positive, while trends of lotteries and Bingo kept on regressing, despite they were able to contain their market losses. Tax revenues in 2015 were basically the same of 2014 in absolute terms (8 billions of Euro), but if we consider their proportion over the gross revenues, they diminished by 3%.

Sales Volumes and Tax revenues in 2016 (in million of Euro)

GAME	Money Collected	Players' wins	Total players' losses	Net tax revenue
Slot machines	26.324	18.841	7.483	4.608
VLT	23.103	20.337	2.767	1.271
Other gaming machines (Comma 7)	236	-	236	19
Bingo	1.602	1.135	467	192
Horse race betting	608	437	171	28
Sports betting	7.505	6.566	939	189
Numerical games with totaliser	1.580	849	731	468
Lotteries	8.981	6.549	2.432	1.336
Lotto	8.093	5.025	3.068	1.809
Remote skill games (Tournament)	755	685	70	14
Card games (Organized in different forms than tournament)	15.231	14.721	510	102
Virtual betting	1.166	974	192	38
Betting exchange	784	781	3	0,8
TOTAL	95.969	76.900	19.069	10.075



Source: Personal elaboration of game collection data of 2016 available on AAMS website

In 2016 players' losses accounted for 19,1 billions of Euro, that correspond to almost 20% of the whole money invested. About 53% of it (€ 10 billion) constitute the net tax revenue for the State (with an increase of almost 25% over the numbers of 2015), so the net income for the industry accounts for almost 9 billion of Euro. The expenses have risen by almost 2 billion of Euro over 2015: the most of it (about 1,4 billion) is due to the increased taxation, introduced with the Stability Law 2016.

The tax revenues have increased by almost 20% over 2015, corresponding to about € 2 billion. This growth is composed for 1,23 billion by income deriving from AWP (slot machines), for 160 million by video lotteries and for 630 million by Lotto. The gross margin deriving from the other games has stayed basically unvaried.

5.5. Possible developments

The following chart summarizes the most significant results and indexes of the last years. We can notice how, the more is the amount played, the less are the players' losses, thanks to the introduction of games with higher payout (i.e. VLTs make players lose less money than slot machines). As a consequence, if we exclude 2016 which has been deeply affected by the reform of the new Stability Law, we can see how State's earnings has decreased constantly over years.

Variation of losses and tax revenues 2004-2016

YEAR	TOTAL MONEY PLAYED (in millions of Euro)	LOSSES (in millions of Euro)	LOSSES %	TAX REVENUES (in millions of Euro)	TAX REVENUES %
2004	24.343	5.909	24,3%	7.358	30,3%
2005	28.173	6.776	24,1%	6.157	21,9%
2006	34.942	8.393	24,0%	6.718	19,2%
2007	41.964	10.153	24,2%	7.194	17,1%

2008	47.379	11.454	24,2%	7.746	16,3%
2009	54.272	13.046	24,0%	8.810	16,2%
2010	61.347	14.259	23,2%	8.733	14,2%
2011	79.850	17.707	22,2%	8.648	10,8%
2012	88.752	18.303	20,6%	8.037	9,1%
2013	84.728	17.455	20,6%	8.179	9,7%
2014	84.485	17.531	20,8%	7.959	9,4%
2015	88.249	17.102	19,4%	8.071	9,1%
2016	95.969	19.069	19,9%	10.075	10,5%

*Source: Personal elaboration of game collection data (2004-2016)
available on AAMS website*

From the overview illustrated just now, it's obvious how the customer has evolved, triggering also an evolution of the games themselves. Customer's increase in selectivity brought also the average payout to rise. Consequently, the real expense and the State's earnings grow less proportionally than the trend of the whole money collection, given that players keep moving on more worthy games with a lower repayment for the State.

There would be some possible interventions (applicable even jointly) to make sure that games with higher payouts don't affect negatively the tax revenue:

1. Block to the remuneration of the distribution chain;
2. Predetermined amount of tax revenue;
3. Gross margin taxation.

The first hypothesis should bring to a growth of tax revenues due to an increase in gross revenues. That implies a reduction of the earnings for distributors and concessionaries that can be applied through a less than proportional increase of distributors' share. This is anyway a rather radical solution.

The second scenario concerns the creation of some tax regulations based on the trend of the previous years to determine in advance the tax amount concessionaries have to pay at the end of the year. To respect this bond, concessionaries have the power to administrate payout levels and the offers portfolio, at the aim to increase the collection of money. In this way the tax revenue would be preserved, by stabilizing the regular introits but allowing the other actors of the value chain to develop the market freely (but always in regards of concessions). Even if this solution could appear easy to apply, it hides a lot of risks due to the extreme freedom to act of operators, especially regarding the social impact of gambling.

The third option (and also the more realistic) is the taxation on gross margin. It would entail a better efficiency and flexibility at the same time. Through this taxation system, successfully adopted in UK, operators are in the position to define the best payout ratio (collection/wins). This approach is based on the change of the tax base and it's the more interesting and innovative for the Italian system. As we saw in the previous paragraphs, this system has been finally adopted for some games with the new Stability Law in 2016 (sports betting and remote skill games taxations are in fact calculated on gross margin).

5.6. Elasticity and Gross Margin taxation

As reported in the previous paragraph, the taxation on gross margin has been applied for the first time in Italy in 2016. Let's now analyze more in detail how the concept of elasticity influences this type of tax. The definition of elasticity of the demand on price was proposed for the first time by the French economist Lèon Walras as the ratio between the variation of the quantity of goods sold and the variation of the price of that good.

$$\varepsilon = (\Delta Q/Q)/(\Delta P/P)$$

Usually the more the price increases, the lower is the quantity of goods sold, but not every good behave the same way and that entails different elasticities among the demands of different goods, according to the level of sensitivity of customers.

Goods with an elastic demand on price are characterized by a more than proportional variation of the demand in front of a variation of price. The elasticity is bigger than 1. ($|\varepsilon| > 1$)

Goods with an inelastic demand on price instead are characterized by a less than proportional variation of the quantity of goods sold in front of a variation of price. The elasticity is smaller than 1. ($|\varepsilon| < 1$)

Finally there are some goods whereby a variation of the price entails a proportional variation also of the quantity of goods sold. The demand of these goods has an elasticity equal to 1. ($|\varepsilon| = 1$)

Thanks to the concept of elasticity it's so possible to understand how a price variation will affect the final revenue given by the product between prize and the quantity of goods sold. Factors that contribute to the definition of elasticity are

numerous and different in nature: they can concern peculiar preferences of customers or their possibility to use alternative or substitute goods. Even the gambling market can be easily assumed as every other market of goods or services and also the flexibility of its demand can be analyzed through the concept of elasticity. We have already defined the price of a bet as the difference between the total cost of the bet and the part destined to the wins; intuitively the demand of a game will be inelastic if an increase of the price will be followed by an increase in the difference between collection and wins. On the contrary, the demand of that game will be elastic if an increase of the price will affect negatively the total difference. The studies on the topic of elasticity in gambling market can be divided in two movements. The first one dates back to the end of 70s, while the second one is related to the begin of the new millennium.

The first study (based on horse race betting and sports betting) was made by Gruen in 1976 and by Suits in 1979. Despite the age of these researches and their reference to the US market, they gave a first verdict on the elasticity of the demand of these games: Gruen found out an elasticity of 1,57 for horse race betting market, while Suits calculated an elasticity of 1,64 for horse race betting and 2,17 for sports betting. The second study was conducted by Paton, Siegel and Vaughan Williams¹⁰ between 2000 and 2004 about sports betting market in UK. The researches confirmed an average elasticity comprised between 1,4 and 1,62¹¹.

Even the European Commission collected a few interesting works on this topic. Fifteen of them are based on different types of bets with totaliser, while three are related to fixed rate betting. The relevant outcome is that both the gambling

¹⁰ Paton, Siegel and Vaughan Williams are researchers of the Nottingham Trent University

¹¹ Source: A. Pandimiglio, M. Spallone - *La valutazione economica delle innovazioni fiscali nel mercato dei giochi: metodologia e anticipazioni*; (2011)

categories revealed an high level of elasticity (1,76 for totaliser and 1,6-2,2 for fixed rate). Despite the number of studies on gambling elasticity is not so high, all of them seem to agree on the fact that the demand of this market is pretty elastic. Beyond the results obtained by literature in the past, it's important to remind that the market of gambling is now living a period of great evolution where an even higher number of variables is destined to become relevant in gambler's decision. The possibility of gathering bets (and money) through the Internet is definitely one of the biggest breaking point with the past. In fact customers can deviate their bets towards illegal or foreign channels, as a response to an increase of prices. In this way they would cause a drop of the demand bigger than the one explainable only by the elasticity, because gamblers can decide to play at a lower price, instead of simply renouncing to play. Summarizing the results obtained in the above mentioned researches, the demand of gambling market appears to be elastic with an estimated elasticity value between 1 and 2. The direct consequence is a market which is quite sensitive to price variations.

As we saw in the previous paragraphs, the price of a bet is constituted by the part which is not destined to be given back to winners: This share comprises agio (that's the remuneration of distribution chain), taxes and remuneration of concessionaries. The Italian tax system hits the gross collection of money without considering the wins, while in other states (such as the UK) the taxation has been reformed by establishing a proportional tax on gross margin. A shift in tax base from collection to margin entails opportunities and problems that require an analysis of the different scenarios, according to the competitiveness and elasticity of the market. The legal monopoly condition characterizing gambling market makes the effects of a specific tax and an ad valorem tax very different from each other. The metamorphosis from a

tax on gross collection to one over gross margin generates market balances characterized by lower prices and bigger quantities according to the elasticity of the sector.

Paton and the other researches from the University of Nottingham, by assuming a market model in the middle between perfect competition and monopoly for the UK, estimated that a tax rate on gross margin that gave the same tax revenue, would make the price of equilibrium lower than in the case of perfect competition. The decrease in price would affect the sales volume and, according to the value of the elasticity of the demand, it would bring to a significant increase of the tax revenues. The benefits of a change from a tax on collection to a tax on gross margin are inversely proportional to the level of competition of the sector. Anyway the shift of tax base wouldn't ensure the equivalence of tax revenue in case of elasticity values next to 1, in fact the increase of gross revenues deriving from a decrease of price may be not sufficient to balance a drop of the tax revenues due to a reduction of the gross margin (price). The hypothesis of Paton seems to be confirmed by the evolution of the gambling market in UK after 2001, year of the shift from taxation on gross revenues to taxation over gross margin: a price reduction by almost 70% caused a growth of gross revenues by 600%. This result, not expectable only by the just explained theoretical demonstration, was possible also thanks to the incorporation of the demand detracted from illegal and foreign markets. The consequence was an increase in the collection of money bigger than the one attributable only to the elasticity of the demand. We can see other confirmations of the theory elaborated by Paton and the other researchers from Nottingham in 2011, when also other European countries have decided to follow the example of the UK, of moving towards a taxation on gross margin. In the February 2013 the English

government introduced a new tax regime also for gaming machines, known as MGD (Machine Game Duty) based on gross margin taxation. This reform has aligned slot machines to the taxation of the rest of the sector, in this way gambling taxation has been made uniform in the whole United Kingdom¹².

Finally also the Italian legislation has decided to follow the English model in 2016, by adopting the gross margin taxation at least for some types of games with the new Stability Law (as explained in the previous paragraphs). We still cannot say if these measures will have positive effects over the next years, improving the previous tax situation, but 2016 results seem to be encouraging in this way.

¹² Source: The modernization of Gambling Taxes, research by Nottingham Univesity
http://www.ntu.ac.uk/research/ref_2014/impact_case_studies/modernisation_gambling_taxes/impact

6. Government position: policies and regulation of gambling in Italy

6.1. History of game taxation

The number of possible events over which people can bet their money has incredibly risen over the last years, favoring a growth of the whole gambling sector thanks to a more and more complete and attractive offer of new games, more competitive than traditional ones, which have become obsolete and less spread. Among the betting sectors, the one characterized by more history and tradition is horse racing. In 1942 the State took the decision to appoint UNIRE (Unione Nazionale per l'Incremento delle Razze Equine) for the management of the sector, so that it could invest the income deriving from games to finance this sport. In 1954 UNIRE released the first permission to a private company for the collection of bets: it was the TIU (Totalizzatore Interurbano dell' Unire), predecessor of the current National Totaliser.

Before introducing the norms and the dispositions approved in the last years it's useful to have a brief overview of the evolution of taxation and of legislation in this sector. Since the unification of Italian Kingdom in 1861, the practice of every kind of gambling was reserved to the State by law. The organization of games was illegal and forbidden by principle, in fact no kind of authorization was conceded, except for traditional horse racing games and some extraordinary football events.¹

The situation started to change after the 2nd World War, with the instauration of the

¹ TULPS, 1891

Republic. The State reserve remained valid, but the organization of skill games and betting competitions was demanded to the Ministry of Finance, which managed the games activity by its own or through third parties only in case of guarantees of suitability. Here the first appearance of the first concessionaries. Sports betting were assigned to CONI, while horse races betting to UNIRE. These two organizations were bonded by two duties: both of them had to reinvest incomes into sport activities which were matter of the bets and they had to pay a 16% tax over the total revenues. This system of State reserve, based on the trust on these two big organizations remained unchanged until 2002, when the administration of those gambling disciplines has been demanded to the State Monopolies.

In 1951 the Lottery Tax was substituted by the Single tax² on skill games and betting with a 23% ratio over the total revenues, that was subsequently raised to 26,8% in 1973. The term “single” means that the tax substituted concretely every type of tax over business (direct tax on incomes or indirect tax). Until 1990 horse races betting were generally considered as accessories activities of the races themselves. Shows and entertainment were matter of taxation, in fact the access to the hippodrome was taxed, instead of bets³: it was considered as a place reserved to the practice of gambling. The organizer of races was supposed to deal with the bets too, and he had to correspond a share of the revenues to the State, deriving from the number of entrances. It's important to notice that there was no direct bond between the tax base and the volume of bets. Single tax and tax on entertainment represented the two main contributors of the tax system until 1997, when the government opted for a new process of tax revision, aimed to make taxation more suitable with the

² Imposta Unica sul gioco d'azzardo

³ D.P.R. 26/10/1972 n.640

situation of that period. With the Financial Law of 1997⁴ in fact, single tax was extended also for horse races betting; it was then modified a year later with different rates depending on the difficulty of the bets themselves⁵. Even sports betting (matter of the tax on entertainment until then) was finally included under the single tax⁶.

6.2. Regulations of gambling before Decreto Bersani (until 2006)

The situation of gambling industry appeared pretty complicated in the last years of the 90s for several reasons. The taxation of games was rather heterogeneous, after the series of reformation approved over years in a very disarranged way: some very popular games (such as Totocalcio) started to show the first symptoms of the crisis that would have invest the whole sector some years later, due to the introduction of new kinds of games, especially fixed rate betting. Here the need to reorganize games taxation through a more homogeneous intervention.

In 1998 a new decree was approved⁷, that established new principles for the tax reorganization and the final extension of the single tax over every gambling sector, in order to gather all the game typologies under an single fiscal framework. It was established a single tax base for every kind of bet, consisting in the sum played, without any deduction. The tax rate was established at a value of 20,2% of the withdrawal share, which was different for every game category according to the

⁴ Law 23/12/1996 n.662

⁵ D.m. 16/05/1997 n.148

⁶ Law 27/12/1997 n.449

⁷ Dec. lgs 23/12/1998 n.504

difficulty of the bet. Until then in fact, games with lower payouts had the same withdrawal share of games with high payouts, despite the gross margin of the bets was much bigger in the first case. It was the first time that there was a more than proportional increase in tax revenue in front of a corresponding increase in difficulty of games (for instance the difficulty of a horse race bet was related to the number of horses played). By increasing the withdrawal share according to the difficulty, also UNIRE and CONI remuneration would have grown in absolute value. Let's now clarify deeply the composition of the withdrawal share, as described in the decree of 1998.

For bets with totaliser the gross withdrawal share depended on the game type and on the complexity of the bet. The gross withdrawal share was composed by three factors: the single tax, the share reserved to concessionaries and the share reserved to sports organizations (CONI and UNIRE). Starting from the gross withdrawal share (different for each game category), the aliquot of single tax (20,2%) was applied first. Then the share due to concessionaries was computed applying an aliquot which varies between 37% and 30,4% to the residual value. Finally the residual amount, after the subtraction of single tax and concessionaries' compensation, was destined to sports organizations.

Just like bets with totaliser, even in fixed rate bets every kind of bet corresponded to a certain aliquot of gross withdrawal share to apply on sums played: that share constituted the tax base. The single tax was then detracted, calculating the 20,2% over the tax base. Then the part destined to sports organizations was computed by applying a 38% withdrawal over the difference between tax base and single tax. Finally, a part of the residual value was reserved to concessionaries, according to their turnover, while the rest of it was made available for future wins.

The substantial difference between the two types of tax imposition laid in the order of calculations: in fixed value bets the share destined to concessionaries was determined in a residual way; while in totaliser bets the share calculated in residual way was the one reserved to sports organizations.

With the new millennium the decreasing trend of some games extended even more, causing a decline also for the revenues of sports organizations which were financed by those games (such as Totocalcio). That bow of the demand was due to obsolescence of certain game categories, in contrast with the increasing selectivity of gamblers. Basically the solutions proposed by the legislator were 2: the reorganization of the whole sector of games to maintain an elevated level of money collection and the struggle against illegal gambling, which kept subtracting bets and bettors from taxation and constituted a serious social problem, given that it was a source of income for criminal organizations. The reorganization proposed was based on the centralization of competencies of CONI and UNIRE into AAMS hands, by leaving untouched the tax mechanism founded on withdrawal shares. The organization and optimization process started in 1998, was finally completed in 2001⁸. Thus it was created a single centre of competences through which it was possible to monitor and evaluate more clearly the collection and to coordinate the activities of taxation, organization and commitment of games. The purpose of this centralization was to reduce significantly the duplication and the overlaps of competencies among sports organizations and to fill the gaps of power thanks to the switch to a unique structure.

⁸ Law 18-10-01 number 383

A new phase of reformation occurred a few years later, starting in 2004 with a first modification of the gross withdrawal share of sports and horse races betting: the market logic wasn't modified but the change favored an increase of the share destined to concessionaries, in front of a negative variation of the single tax (passed from 20,2% to 15,7%). Further adjustments were introduced after the results of an investigation on the sector conducted by the Senate Committee for Finance and Treasury⁹. The directions at the base of this research were basically three:

1. The struggle against clandestine and illegal gambling;
2. The predisposition of the requirements to widen the offer of online games;
3. An ulterior law simplification to facilitate the activity of Italian operators.

The key operation for the legalization of the illegal gambling was the legalization of slot machines in 2004: the good result of the operation was due to the creation of a technological system of connection among these devices, allowing an immediate control of money collection and taxes. As explained in the previous chapter, slot machines were taxed with a particular fee called PREU¹⁰, which was initially fixed at a value equal to the 13,5% of the sums played. The legislator undertook a policy based on tax leverage, by dramatically reducing the tax revenue in order to make games more competitive and worthy; in this way it was possible to tackle clandestine competitors (black gambling) and international competitors (grey gambling). Moreover the basis for a widening and development of the offer were laid, both by increasing the available games and by empowering the gathering network: through the modernization of the supply, the legislator tried to attract the

⁹ Cognitive investigation about gambling sector arranged by Senato, Commissione Finanze e Tesoro, XVII n.10.

¹⁰ Prelievo Erariale Unico, Art 39, DL 269 of 2003

attention of the demand to dissuade customers from the concurrent offer of games. In the last years has emerged how the burdensome fiscal withdraw is the most penalizing element for the legal gambling market. From the direct fight against black and grey gambling, the government passed to legal actions aimed to contrast indirectly the competitors, in order to make operators' activity easier than for the foreign ones, through a slighter fiscal burden, that had allowed the bookmakers to offer better games rates to attract Italian customers through the Internet. The Financial Law of 2006¹¹ was aimed to face the cross-border flows of bets through the modification of the single tax mechanism, connecting it to the gross collection of money rather than to the gross withdrawal shares (and indirectly, to the difficulty of games). For the first time an automatic aliquot drop system in front of the growing of money collection was adopted. For instance the aliquot for fixed rate betting was established as the 3% of the collection in case of 7 or less events played and 9,5% in case of more than 7 events played, and it went down in front of an increase of the gross collection.

6.3. Decreto Bersani and renovation of taxation

As we saw previously, the supply of games appeared deeply modified thanks to the diffusion of the Internet and the consequent introduction of the long range payments, through which players could bet just with a Web connection. This change, oriented towards an enlargement of the market, brought to an evolution both of the demand and of the offer. Given a more dynamic and selective demand, the supply

¹¹ Law 2-12-2005 number 248

has been continuously and notably expanded, in order to attract even more customers. The possibility to play at home with any European bookmaker has determined an internationalization of competition that was unexpected just a few years before. In particular fixed rate betting is the sector where this global competition is more evident, in fact the customer can easily compare the rates that different bookmakers offer for the same events, thus opting for the best one. Despite the Italian legislation doesn't allow the direct flow of money to foreign bookmakers, they operate legally in their countries of origin, hence they can accept stakes from other countries making them converge electronically within their network, paying normally the wins. The success of foreign operators over Italian ones is due to a better appeal to the clients for two reasons:

- Firstly some nations can count on an historical tradition for fixed rate betting, which means a wider offer both of playable events and of types of bets on those events.
- Secondly, these nations are favored by a lighter fiscal burden that allows operators to lower the price of bets and to raise their fixed rates.

Both of these competitive advantages are present in anglo-saxon countries that benefits from a fiscal imposition which loads less on revenues. Despite the collection form was not fully authorized, it was hardly punishable because the head offices were settled in countries whereby they exercised legally their activity: Internet allowed the swindle of the Italian legal reserve.

The State couldn't do anything but extending the fluency of the sector, by implementing logics of the Italian market, integrated with the international

competition, and by trying to protect Italian operators, given that they were the only source of tax revenues. The intervention of the government in this field occurred with Decreto Bersani¹² in 2006, a set of measures necessary for the revival of the public expense. The innovation regarding the gaming sector concerned new types of games and new forms of collection, as well as a gradual reduction of taxes, to relaunch the market by modifying the tax imposition system, with the definitive elimination of withdrawal shares.

The introduction of new games, aimed to fight illegal market and tax evasion, has concerned the acknowledgment of other typologies of games available on the international market: the main new games categories introduced were peer to peer betting and skill games. The need to introduce these new kinds of games were bonded to the great success characterizing these modalities in other European markets, which had attracted also many Italian players. Peer to peer gambling was taxed with an aliquot equal to the 3% of the gross collection. In this kind of game there is the elimination of risk for the house (the operators), related to the impossibility to know the trend of collection, now moderated with a constant adjustment of rates depending on betting flows. The effect on gamblers was the increase of competitiveness of betting rates.

The second big innovation has been the introduction of skill games based on the direct interaction among players. While peer to peer betting consists of an evolution of sports betting, whereby customers against each other instead of against bookmakers, in skill games players take part together to games of ability, often based on cards games. The most spread example is for sure online poker that allows gamblers to play together by paying a commission to the owner of the platform

¹² 4-7-2006, number 223

equal to the 10% of the sum played, with 90% return over total wins.

The decree has declared also the empowerment of the collection network for a more capillary distribution of betting centers, even by allowing the betting sales in special corners, within bars and smoke shops. These corners have had an important success, and their number arose over 12.000 units in the whole country.

The third aspect related to Decreto Bersani concerns the modification of the fiscal imposition, in particular for fixed rate betting (apart from horse racing). The aliquot of this category in fact was adjusted, making the whole system more flexible since it was established a progressive reduction of the tax rate in front of a growth of the collection. In the following chart is summarized the mechanism of the new tax brackets. This system allowed to increase the tax revenues and to progressively reduce the aliquots at the same time¹³.

Tax brackets mechanism in sports betting taxation

Collection (in million of Euro)	More than 7 events played	Until 7 events played
1.850	3%	8%
2.150	3%	6,80%
2.500	3%	6%
3.000	2,50%	5,50%
3.500	2%	5%

Source: Barbera and Berardi (2007)

¹³ Accompagnamento D.L. 4-7-06 n. 223.

The update of the aliquot was applied monthly and it was referred to the collection of the last 12 months; this mechanism was aimed to favor the stability of the system, to attract new investments and to avoid the escape of operators towards foreign markets. Tax rates were divided in two types according to the number of events played (more or less than 7 events) to keep a parameter dependent on risk.

6.4.Evolution of regulation and taxes after Decreto Bersani

In the phase after Decreto Bersani, legislator's activity was focused to keep fighting against illegal gambling in order to increase the money collection of the sector. As we already know from the previous chapters, this boost lasted until 2012, year that signed the begin of a stasis. The estimation on illegal gambling of 2006 proposed that in front of 200.000 slot machines legally connected to the PREU electronic system, there was a counterpart of at least other 200.000 illegal devices¹⁴. The Community law of 2008 established the necessary dispositions to avoid the propagation of irregular and clandestine games, by intervening on the remote games (online) sector. It contemplated 200 new concessions to assign according to specific conditions and requirements which obliged concessionaries to operate through AAMS central system, while customers were supposed to subscribe special contracts of "game account" to take part to the games¹⁵. Furthermore in 2009 aliquots of PREU were item of a modification that shifted them from a fixed rate of 13,5% over the gross collection, to a staggered system: brackets of PREU were comprised between 12,6% and 8% according to the collection of sums played. In 2010 VLTs made their

¹⁴ M. Stottmeier -*Il Mercato dei giochi in Italia – analisi del settore e delle innovazioni relative alla tassazione*; (2016)

¹⁵ Law number 88 of 2009

first appearance thanks to another maneuver, part of an extraordinary plan always aimed to face illegal gambling that in addition empowered also the centralization of power in favor of AAMS¹⁶. The following year a new decree was emanated that, besides a restyling of games in decline and a variation on PREU, introduced a new tax form: an additional 6% fee in wins higher than € 500 for the amount exceeding € 500¹⁷. This tax is still comprised in the Stability Law of 2016 and its mandatory only for a few games: VLT, instantaneous lotteries and numerical games with national totaliser.

The first protection measures for customers appeared only at the end of this phase, with the Stability Law of 2011: in particular it was declared the “prohibition of taking part to games with cash prizes” to every person younger than 18, with the relative sanctions¹⁸.

6.4.1. Decreto Balduzzi and customer protection

Regulations about protection of children and customers found their peak in *Decreto Balduzzi*, also known as *Decreto Salute* of 2012. This decree still remains one of the pillar of the normative of games, so that it has a reserved collocation in the main webpage dedicated to the discipline and the information of AAMS games¹⁹. It represent the milestone of customer protection in gambling sector and here below a list of its main instructions is reported:

¹⁶ Law number 40 of 2010

¹⁷ DL number 138 of 2011

¹⁸ Art 24, DL number 98 of 2011

¹⁹ Source: <http://www.avvisopubblico.it/home/documentazione/gioco-dazzardo/sintesi-della-normativa-in-materia-di-gioco-dazzardo-e-ludopatia/>

- As far as health profiles are concerned, it is planned to update the essential levels of care with reference to prevention, care and rehabilitation services for people affected by ludopathy. To implement this provision, the National Action Plan has been approved.
- In order to contain advertisements, it is forbidden to insert cash game advertisements through television and radio broadcasts, as well as for theatrical or cinematographic performances not prohibited to children. Advertising games are also prohibited with cash prizes in newspapers, magazines, publications, as well on the Internet, which encourage the game or enhance its practice, and which don't warn about the risk of being addicted to the practice of the game. Advertising must clearly show the percentage of winning odds that the person has in the single game.
- Warning about the risk of gambling dependency must be reported on play cards and coupons; on gaming machines (AWP); in rooms with video terminals (VLT); in the points of sale of bets on sportive events and not; on the websites destined for gambling with cash prizes.
- The Ministry of Education points out the importance of the responsive game of the primary and secondary schools for the purpose of organizing organization and education campaigns on the topic.
- The entry for people younger than 18 years in gambling areas with cash prizes in Bingo halls, in the areas where VLT equipment is installed and in betting points, is prohibited. The operator is required to identify the age of minors by requesting the display of an identity document, except in cases where the age of majority is evident.

- The intensification of controls and a progressive redeployment of the knots of the physical collection point network to take account of the presence in the territory of schools, health and hospital facilities, places of worship, socio-recreational and sports centers.

According to the Decreto Balduzzi, an Observatory was finally established to evaluate the most effective measures to counter the spread of gambling and the phenomenon of serious addiction. This observatory was initially established by AAMS, but it was subsequently transferred under the competencies of the Ministry of Health, which also modifies the composition, to ensure the presence of experts and representatives of the regions, local authorities and related organizations.²⁰

Example of informative note, as indicated in Decreto Balduzzi

Note informative sulle probabilità di vincita



Gioco SuperEnalotto - calcolo delle probabilità
Costo combinazione: 1 Euro (giocata minima 1 combinazione)
Matrice: 6 su 90

Categoria	Punti	Probabilità 1 su
1^	6	622.614.630
2^	5+1	103.769.105
3^	5	1.250.230
4^	4	11.907
5^	3	327
6^	2	22

Source: AAMS website

²⁰ Law no. 190 of 2014

The expression “player protection” means the set of tools and regulations used and approved by the State in order to reduce cases of pathological addiction to gambling and to avoid frauds and illegality; the role of players protector is exercised by AAMS, that in its service charter assures its commitment towards the player in:

- Informing about remote games and explaining “how to play legally and responsibly”;
- Adopting and declaring publicly its own quality standards and those imposed to concessionaries;
- Keeping under control the respect of its tasks;
- Granting the player for the obligation taken directly;
- Furnishing the player of a tool to signal the missed compliance to any of the conditions (through a special complain);
- Intervening directly at concessionaries in case of their lack of compliance to any of their duties towards players.

The player is guaranteed for:

- The right to receive information about legal gambling;
- The right to be listened in case of qualitative shortage or in case of infringement;
- The right of checking public data related to other players’ games;
- Online remote control.

The healthcare service offered to people reporting symptoms of pathological addiction to gambling (GAP²¹) is part of player’s protection too; actually the

²¹ Gioco d’azzardo Patologico

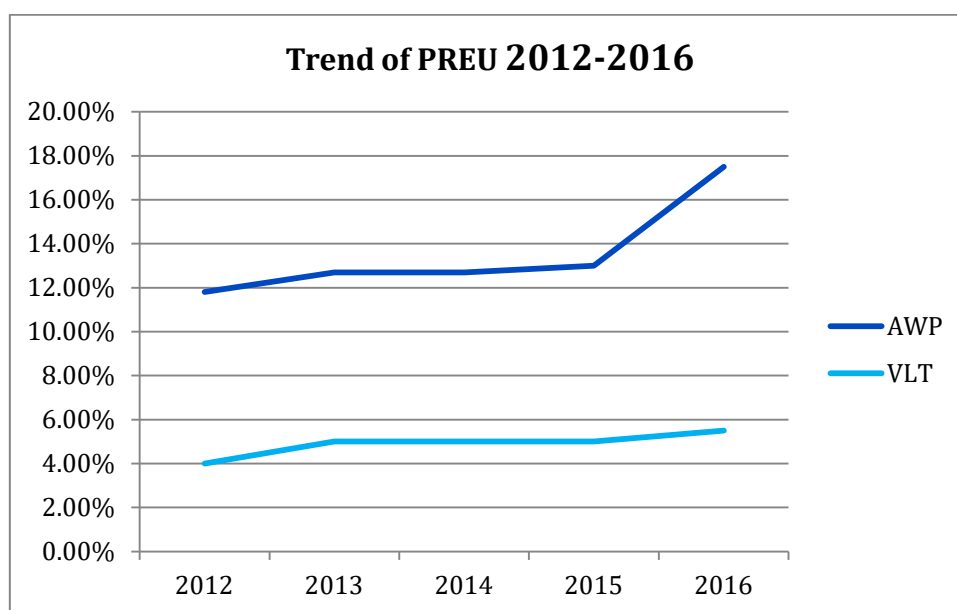
discipline for this topic has not been easily approved at a national level: pathological gambling was firstly acknowledged by the World Health Organization, and then by some Italian regions, which committed to create the suitable supporting means and structures. The first region having recognized GAP as a disease has been Piemonte in 2006, followed by Tuscany. So initiatives and regulations came out firstly by these two sensitive regions, given the lack of a national discipline on the issue at that time.

6.4.2. PREU and Slot taxation

The plan of contrast to illegal gambling undertaken with Decreto Bersani brought the number of slots AWP to reach 350.000 units in 2012, and the number of VLT to 45.000 units²². The key factor in this battle has been the electronic system PREU, whereby have been incorporated most of the old illegal devices. Right in 2012, just after the AAMS decree establishing the additional 6% tax on wins exceeding € 500, some other measures regarding the taxation of both AWP and VLT were adopted, in order to ensure higher revenues for the State. These measures consisted in a variation of PREU for both AWP and VLT; in particular the main difference between the two devices derived from the additional tax on wins exceeding € 500 that had been applied only on VLT²³: that has determined a more than doubled tax rate of AWP over VLT, as observable in the following graph.

²² Data presented to the Federal Commission of Finance by Luigi Magistro, general director of State monopolies, 13th September 2012.

²³ B. G. Mattarella, A. Battaglia - *Le regole dei giochi : la disciplina pubblicistica dei giochi e delle scommesse in Italia*; (2014)



Personal elaboration of gaming machine taxation data 2012-2016

More specifically, since 2012 VLT were taxed for 4% over the gross collection, plus the additional 6% fee on wins over € 500. In 2013, according to the Stability law of that year, the additional part remained unvaried, while the percentage on gross collection rose to 5%²⁴. That value stayed unchanged until 2016, when the new Stability Law has fixed the PREU at 5,5% of the gross collection. However, also in this case the additional fee has remained unvaried²⁵.

For what concerns AWP, the measure of PREU has been item of an additional step: in 2012 PREU was calculated as the 11,8% of the gross revenue; then the percentage was raised to 12,7% for the period between January 2013 and December 2014. In addition it was established a minimum payout of 74% for each device. This limit hasn't changed in the following years, but the percentage of PREU increased further

²⁴ Law no. 228 of 2012, Stability Law of 2013

²⁵ Law no. 208 of 2015, Stability Law of 2016

to 13% of the sums played. The last changed occurred with the Stability Law of 2016, that has fixed a 17,5% withdrawal over the sums played.

6.4.3. Stability Law of 2015 and 2016

The Stability Law of 2015²⁶, imposed the continuation of the policy of fiscal regularization for those activities which kept operating on illegal markets. The law contemplated the possibility to regularize the position of those who offered bets with cash wins in Italy but which were not linked to the national totaliser AAMS. The aim was to cope with online gambling by imposing the regularization of businesses to providers (also foreign ones). This was allowed only if some specific requirements were satisfied, which comprised a declaration of commitment to tax compliance to send to AAMS, and consequent inclusion in the national totaliser²⁷.

The stability law of 2016 has introduced new dispositions aimed to the modification of the tax imposition system. The main revolution, already introduced and explained in the 6th chapter, regards the transition from a specific tax imposition to a proportional tax imposition: from a tax base consisting of the gross collection to one consisting in the gross margin (= gross collection – wins). This imposition system was adopted for fixed rate betting (overturning the framework delineated by Decreto Bersani), for remote skill games and, since 1st January 2017 also for Bingo. The taxation is computed on different tax rates: in particular 18% for physical sports betting and 22% for remote sports betting; 20% for remote skill games and Bingo. A further provision regards the increase of PREU for slot machines, while

²⁶ Art. 1, comma 643, of the law 23 December 2014, no. 190

²⁷ G. Agrifoglio - *Il gioco e la scommessa : tra ordinamento sportivo e pubblici poteri*; (2016)

reducing the minimum percentage set aside for winnings (payout) from 74% to 70%. Besides the field of taxation, also a series of prohibitions regarding advertising have been emanated, which are entrusted to the Communications Authority (AGCOM). In particular the advertising of trademarks or gaming products with money winnings must comply with the principles set out in the European Commission Recommendation 2014/478/EU. Bans refer to messages concerning advertising which encourages excessive or uncontrolled game, that deny the gambling risks, that present the game as a way to solve financial problems, which suggest that player's ability allow to win systematically, or which address to minors. In implementing this provision, the Ministerial decree of 19th July 2016 identifies in general the TV channels in the numbers 1 to 9 from 7am to 10pm and excludes from the prohibition of advertising Pay TV (Sky and Mediaset Premium).

6.5. European Community orientations

The laws of individual European states are very heterogeneous on this topic, spanning from strict norms and prohibitions for some states to the total (or almost) freedom for other nations, such as East-Europe countries. In 2008 there was a first intervention on the topic, with the communitarian law of 2008, for the regulation of online forms of gambling, to counter the spread of irregular and illegal game²⁸. According to the law, State Monopolies could allow 200 new licenses for online gambling, to assign both to new subjects and to concessionaries that were already owners of public games authorization. Among the requirements to have the license,

²⁸ Source: <http://leg16.camera.it/465?area=20&tema=62&Giochi>

it was necessary a revenues of at least 1,5 million of Euro over the last two years. A bank or insurance warranty of the same amount was instead required for those who were not already operating; the warranty had to be sent to the State Monopolies.

Number of concessions/authorizations released in Italy in 2016

GAMES	NUMBER OF CONCESSIONS
Sports betting and horse race betting	247
Online Games	92
Numerical games with totaliser	1
Lotto and Lotteries	1
Bingo	206
Gaming Machines (AWP and VLT)	12

Source: AAMS game collection data, available on AAMS official website, 2016

Another important aspect of the Communitarian Law of 2008 was that anyone wishing to play online (betting, lotteries, poker, ecc.) could reach the specific websites only by passing through a platform handled by State Monopolies²⁹. That

²⁹ Source: <https://www.sbo.net/it/scommesse-sportive-su-internet-in-italia/>

constituted a kind of big funnel, always hated and hindered by concessionaries, at the point that the law has been replaced by a less strict one, which contemplates that players can access the websites only after an electronic registration to the AAMS website. If the registration was not required, the concessionary had to broadcast to AAMS the anonymous information about every single bet, withdrawals and deposits made of each game account.

In 2013 the European Parliament has established that the European Court must allow the member states to avail of restrictive measures for customers protection against gambling, even if those norms would be in contrast with the principles of free economic initiative explicitly guaranteed by the European Union: it constitutes so a derogation to the prohibition of violation of these principles, aimed to protect citizens against risk of game addiction. In 2014 the European commission presented a Recommendation (an act which is not bonding for the nation receiving it, but which has validity for every member state) encouraging countries to observe and respect rules and criteria protecting citizens, and in particular minors and people addicted to gambling, by adopting suitable policies of information³⁰. At this purpose the member states are invited to utilize principles related to online gambling and responsive advertising and sponsorship of these services. In particular advertisements should communicate objective data and recommendations about gambling risks (for instance the time limit for a responsive game session, or the advisable amount to bet). Concrete advice against the practice of gambling by young people consist in the introduction of specific requirements to access betting points (such as the exhibition of the ID card before the entry) or, in case of online games,

³⁰ 2014/478/UE: Commission recommendation of 14th July 2014 on principles for the protection of consumers and players of online gambling services and for the prevention of minors from gambling

the control by operators of users' conformity and of their bank account data. Furthermore the UE incentives and finances policies of assistance for pathological gamblers who need help through physical staff or electronic means (such as the introduction of auxiliary phone lines)³¹.

³¹Source: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014H0478>

Conclusions

In these pages we have seen how the phenomenon of gambling has grown and spread year over year, ending up to achieve the current impressive numbers. Today Italy is the first placed in Europe and ranked third among the countries that play the most in the world. From the overview offered in first chapters it's evident the notable relevance of the public gambling system; nevertheless, this market has shown some worrying characteristics, among which the infiltration of criminal organizations and the plague of pathological gambling (GAP¹). About half of the population has played at least once in the last 12 months and almost a million of them have developed an addiction to game. These data are constantly increasing, witness of a pathology that is affecting also young people and women. In the previous chapters we have tried to analyze decisional process of gamblers and, after having approached the Expected utility theory by Von Neumann-Morgenstern, we found out that people's tendency to bet their money is not explainable with a strict rational logic, but it depends on their propensity for risk, which varies among individuals according to emotional and psychological elements. At a regulatory level there is a void and a struggle between gambling as monetary source for the State and gambling as social plague. We have seen that the Italian legislation doesn't side with any of the two parties, in fact the regulation leaves, more or less intentionally, voids in the key points of the discipline: it acknowledges the legality of gambling and its entrusting to private companies, while on the other hand it guarantees information rights about the consequences deriving from game addiction and it pushes for the implementation of measures and structures to help

¹ Gioco d'azzardo Patologico

pathological gamblers. The adoption of Decreto Balduzzi depicted only a first limited attempt to put some stakes to the delicate issue of GAP; what emerges from this long and suffered path of regulation is a steady conflict of interest between large part of politics and the entrepreneurial system, that strongly hinders the harmonious development of this delicate sector. Year over year, specific provisions have been adopted, that haven't optimized the administration of the monopoly of games, ending to turn the legislator away from the formulation of a complete and wide-ranging articulation, that the matter of gambling should require.

Even in terms of taxation, the current framework seems not to be the most suitable for the state of the market. The paradox of the divergence between the growing trend of collection and the flexing trend of tax revenues occurred in the last years is the portrait of a series of causes among which the different fiscal treatment applied to the various types of games assumes a central relevance. Previously we have seen how the difference in payouts between new and traditional games has been increasing over years. That has brought collection to stabilize and market to saturate, given that now customers opt for more worthwhile games due to their increased selectivity, as confirmed by data relative to slot machines and VLTs, accounting for half of the whole collection. The structural slump in revenues could be faced with a reduction of tax rates: this strategy may even generate an increase in tax revenues if the demand of games remained pretty elastic. In fact the reduction of aliquots would entail an increase in payouts able to generate an increase of the demand, as to compensate the drop of unitary revenue. Another more practicable way to support the development of the sector and to face the reduction of revenues is the modification of the tax base, by switching from a specific tax on quantity to a proportional tax on gross margin. As showed in the sixth chapter, a reformation

focused on gross margin taxation, if applied to every game, would assure a better efficiency and fairness, thus improving the competitiveness of the market. On the other hand some delicate issues should be faced carefully: the rising volumes of bets would trigger a social case to solve by allowing gambling only in authorized spaces, and by limiting the advertising. The taxation on gross margin has been adopted for the first time in Italy with the last Stability Law of 2016, just for a bunch of gambling disciplines. Data of 2016 have showed a partial improvement in tax revenues compared to the last years, but we need to observe the trend over the next years before taking the right conclusions and maybe thinking of extending the reformation also for the other games.

According to the trends presented, the policy-makers are now called to take bold decisions in terms of rationalization of the games supply and to enact important fiscal reforms to modify the current games taxation, while respecting the principles of fairness and flexibility, for the sake not only of the State but also of customers and of the stakeholders of the value chain (operators, employees, concessionaries, bar owners etc.). This market needs in fact a careful and controlled growth to guarantee an always efficient and sustainable development.

Bibliography

Agrifoglio, G., (2016); *Il gioco e la scommessa: tra ordinamento sportivo e pubblici poteri*.

Amministrazione Autonoma dei Monopoli di Stato, (2012-2016) – AAMS; *Organizzazione, attività e statistica*.

Barbera, G. - Beradi, D., (2007); *La tassazione delle scommesse: verso un'imposta sul margine lordo*, Ricerche e consulenze per l'Economia e la Finanza.

Binde P., (2005); *Gambling, exchange systems, and moralities*. *Journal of Gambling Studies*, 21, 445–479.

Bosi, P. - Guerra, M.C., (2015); *I tributi nell'economia italiana*, Il Mulino.

Caillois R., (1958); *Les jeux et les hommes: le masque et le vertige*, Bompiani.

Ciaccio C.P., (2010); *Internet gambling: recent developments and state of the law*. *Berkeley Technology Law Journal*, 529-553.

Conlisk, John (1993); *The Utility of Gambling*, *Journal of Risk and Uncertainty*, 6, 255–275.

Coryn, T., Fijnaut, C., Littler, A., (2008); *Economic aspects of gambling regulation: EU and US Perspectives*.

Croce, M., Zerbetto R.,(2001); *Il gioco & l'azzardo: Il fenomeno, la clinica, le possibilità di intervento*, Editore Franco Angeli.

Daninos F., (2010); *Storia del poker*, Odoja.

Eadington, W. R., Cornelius, A.,(1999); *The business of gaming: economic and management issues*, University of Nevada, Las Vegas.

Fishburn, P. C., (1982); *The Foundations of Expected Utility*.

Li Calzi, M. (2016); *La Matematica dell'incertezza*, Il Mulino.

Mattarella, B. G., Battaglia, A., (2014); *Le regole dei giochi : la disciplina pubblicistica dei giochi e delle scommesse in Italia*; IRPA (Istituto di ricerche sulla pubblica amministrazione).

Pandimiglio, A., Spallone, M., (2011); *La valutazione economica delle innovazioni fiscali nel mercato dei giochi: metodologia e anticipazioni*.

Paton, S., Siegel, D., Vaughan W., L., (2000); *An Economic Analysis of the Options for Betting Taxation*, HM Custom Excise.

Paton, S., Siegel, D., Vaughan W., L., (2004); *Taxation and the Demand for Gambling: new Evidence from the United Kingdom*, in *National Tax Journal*, 57.

Povoledo, E., (2013); *Fears of Social Breakdown as gambling Explodes in Italy*, The New York Times, 28/12/2013.

Peel, D., (2009); *Economics of betting markets*.

Rosen, H.S., (2014); *Scienza delle finanze*, McGraw-Hill.

Schwartz D. (2009); *More pathological poker*, Center of gaming research.

Suits, D.B., (1979); *The Elasticity of Demand for Gambling*, in *Quarterly Journal of Economics*, 93.

The Economist, (2017); *The world's biggest gamblers*, 9/02/2017.

Toffa, N., (2014); *Quando il gioco si fa duro: dalle slot machine alle lotterie di Stato, come difendersi in un paese travolto dall'azzardomania*.

Varian, H. R., (2011), *Microeconomia*, Libreria Editrice Cafoscarina.

Visentini, I., (2017); *Lotterie e slot: affari raddoppiati in 8 anni*, Il Sole 24 ore, 23/01/2017.

Walker, D. M., (2013); *Casinonomics, The Socioeconomic impacts of the Casino Industry*.

Williams A., (2000); *Il gioco d'azzardo*.

Williams, L. V., Siegel. D. S., (2013); *The Oxford Handbook of the economics of gambling*.